

# MILMAG

INTERNATIONAL

CZECH  
ARMED  
FORCES  
IN THE MIDST  
OF TECHNICAL  
MODERNIZATION

F35  
FOR  
POLAND

POLAND  
IN NATO  
20<sup>TH</sup> ANNIVERSARY

C A M M  
IS JUST A BEGINNING

PARIS AIR  
SHOW 2019







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# PIAP GRYF®

## EOD MOBILE ROBOT



**PIAP GRYF® is a robot used for reconnaissance of terrain and hard to reach places. The manipulator with 5 degrees of freedom allows to lift loads weighing up to 15 kg.**

**Robot's wheels can easily be removed, which reduces the dimensions of the robot and thus facilitates missions in tight spaces.**

Owing to the applied drives, the robot smoothly overcomes uneven terrain and obstacles up to an angle of 45°. The robot is characterised by excellent manoeuvrability. Low weight makes it easy to transport and carry the robot, and its modular design allows for quick and easy change of additional equipment.



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## US F-35 AT ŠIAULIAI AB

On July 18th F-35A Lightning II multirole fighter aircraft of the United States Air Force (USAF) landed at the Lithuanian Air Force Base in Šiauliai. They joined the F-15E fighters and C-130 mobility aircraft that arrived in Lithuania at the earlier date to take part in the air defence Operation 'Rapid Forge', for the first time held in our region.

'I am happy and proud that soldiers of the Lithuanian Air Force are doing their part of the work in the exercise professionally. They have shown their ability to deconflict and assign airspace, control the most cutting-edge aircraft, carry out land-based air defence and to render Host Nation Support properly', said Commander of the Lithuanian Air Force, Col. Dainius Guzas.

The F-35A carried out refuelling at the Šiauliai Airbase from where the 5th generation aircraft took off to train air-to-air battle in the Lithuanian airspace while receiving tactical air control from the Combined Control and Reporting Centre Karmėlava. Land-based air defence was ensured by the Air Defence Battalion of the Lithuanian Air Force.

From July 23rd to July 25th American fighter aircraft are planned to conduct fire support training in the Lithuanian airspace and practice destroying ground-based targets in Kazlų Rūda Training Area. Members of Lithuanian and U.S. special forces as well as partners from other services will direct fire support strikes towards ground-based targets and ensure integration.

📷 Lithuanian MoD



## GERMANY SEEKS RECCE VEHICLES

Krauss-Maffei Wegmann (KMW) will supply Mungo N/C Recce vehicles to the German Army by the end of 2022.

The Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support (BAAINBw) has commissioned Krauss-Maffei Wegmann (KMW) to supply a total of nine Mungo N/C Recce reconnaissance systems. In addition to supplying the vehicles, the contract encompasses spare parts packages and the training of crew and maintenance personnel.

The N/C Recce variant of the Mungo vehicle is able to detect and identify nuclear and chemical threats. For that, the three-man crew has at its



disposal a mass spectrometer, weather sensors and a radiation detection device, among other things.

The crew remains inside the secure vehicle throughout the entire detection and analysis process. The ground can

even be marked from inside the vehicle in the event of contamination. The Mungo N/C Recce can be transported in a CH53 helicopter due to its light weight and external dimensions.

📷 KMW





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# DENMARK MODERNIZES AIR-DEFENCE

The Danish Acquisition and Logistics Organization (DALO) has announced its intention to launch a tender for the acquisition of a new Ground Based Air Defence system. The future deal will also include provision of spare parts and technical support.

Under the new Ground Based Air Defence program Danish Armed Forces intend to procure a complete system to support protection of ground troops against airborne threats. GBAD will be a surface to air missile and/or gun system consisting of sensors, effectors and C2 system. In general, the future air-defence system will consist of six components:

- a short/medium range radar for target detection, including a secondary radar mode 5;

- an electro-optical Infrared tracker;
- a ground-based launcher for AM-RAAM-120B missiles;
- a CROWS system for Stinger missiles;
- a C2 command and control system/ fire control center including all necessary network and interconnections, software and interface to make the system fully functional;
- support and logistic vehicles and equipment.

The C2 software is expected to support a variety of sensor and effector units. The complete system must include standard interface and protocols for external connection. The GBAD system will be integrated onto Eagle 5 and Scania trucks or similar vehicles.

It is a requirement that the mentioned GBAD platform will at least re-use the current available missiles from AMRA-AM and Stinger family. One complete GBAD system, a battery for a Brigade and Fire Direction Center (FDC), is to be delivered during 2022-2023. DALO is considering further development of the system after 2023 and it must be possible for the Danish army to acquire additional GBAD systems or components for GBAD system after 2023.

The GBAD system is expected to integrate and exchange data with all involved units and also external units. The GBAD training and simulation system is expected to support training of operators, and possible also education of technical personnel.

.📷 Raytheon







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# THE LUKASIEWICZ- PIAP INSTITUTE ENTERS



The Warsaw based Lukaszewicz – PIAP Institute each year exhibits a wide range of innovative products, which might help the company to strengthen its position on local markets and look for new sales opportunities all around the World.

During this year's IDEF 2019 exhibition in Turkey the Lukaszewicz – PIAP Institute promoted its PIAP Fenix light reconnaissance robot and the newest generation of the Tactical Throwing Robot (TRM). For the first time in its history the PIAP Institute presented its offer

as a member of the Łukaszewicz Research Network, the third largest research institution of this kind in Europe, which uses the output of 38 research institutes to present a comprehensive offer and innovative solutions to its clients and industry partners.



# NEW MARKETS



The manufacturer perceives Turkey and the wider Middle East region as a particularly attractive market with a big grow potential. Therefore, through its presence at exhibitions such as IDEF 2019, the company intends to make new business contacts and lay the grounds for promising cooperation

with local industry partners, while at the same time enhancing its sales opportunities.

The Lukasiewicz – PIAP Institute already has an impressive record of sales to several countries in the region. Over the last couple of years, it exported several dozen of PIAP Scout reconnaissance robots to the armed forces of Saudi Arabia and a range of products to UAE.

Currently, the Polish manufacturer takes part in a series of tenders being launched all across the region, like the one in Saudi Arabia, which calls for the delivery of several dozen ground robots to country's interior security institutions. It also looks forward to exporting of a number of unmanned systems to potential future clients in Kuwait and Oman, where the company intends to offer the PIAP Fenix light reconnaissance robot fitted with Logos Imaging' portable inspection systems, among a wide range of other products.

According to the company's representatives, cooperation with international industry partners, such as the aforementioned Logos Imaging, is a result of the PIAP's long-term business strategy, under which it intends to act not only as a provider of single, self-reliant inspection robots, but also a manufacturer of complex, modular and versatile systems integrated with a number of auxiliary accessories.

Aside from promoting its products on the Middle Eastern markets, the Lukasiewicz – PIAP Institute also intends to grow strong locally, as it continues deliveries of a wide range of its robots and auxiliary equipment to European clients, such as

Romania, which in the past months took another delivery of PIAP Gryf robots for the country's Air Force. The delivery included a modified variant of PIAP Gryf, which was designed for applications such as reconnaissance of various terrain and hard-to-reach locations.

The PIAP Gryf robot for Romania has a weight reduced by 10 kg and is fitted with a smaller, lighter 4-axis manipulator and a gripper arm. The platform was also equipped with a fixing point for a recoilless pyrotechnical launcher, a special backpack developed for easy carry of the robot and a set of new applications for traversing difficult terrain.

Particular elements of the driving platform, like wheels, are quickly and easily removable, which lessens robot's footprint and makes operating in confined spaces less demanding. The robot is designed to traverse obstacles and terrain of up to 45 degrees inclination. Low weight makes it easy to transport the platform, while the modular construction enables quick and easy changes of accessories. The robot comes with a light, full HD control panel display. According to the manufacturer, the lightened PIAP Gryf robot can pick up loads of up to 10 kg.

The PIAP Gryf robot is compatible with a number of accessories such as VULKAN CSL 50-40 VUL and VIPER CSL 50-30 VIP pyrotechnical launchers, semi-automatic shotguns, LOGOS Imaging's Monos X-ray device, explosive vapor detector, optical fiber cable reel, or a trunk line for remote detonation of explosives.

📷 Michał Jarocki



# USN UPGRADES MK 45 NAVAL GUNS



US Navy awarded BAE Systems \$70 million contract for the upgrade of its Mk 45 naval gun systems to the Mod 4 configuration, which provides Naval Surface Fire Support (NSFS) range of even more than 20 nautical miles (36 km).

Under the recently issued contract, worth \$70.6 million, to upgrade existing guns to the Mod 4 configuration, BAE Systems will deliver five Mk 45 naval gun systems to the US Navy, increasing their firepower and extending their range.

'The Mk 45 retains its reputation as the industry standard for large-caliber

naval guns, and the Mod 4 makes it adaptable to advanced munitions', said Joseph Senftle, vice president and general manager of Weapon Systems at BAE Systems. 'We are the world leader in developing and manufacturing maritime guns and producing reliable and affordable technology that meets the warfighter's needs today and into the future', he added.

Work on the Mk 45 Mod 4 upgrades will be performed at the BAE Systems facility in Louisville, Kentucky, with support from the company's supplier base, and is expected to be completed by the end of 2023.

According to the manufacturer, the Mk 45 is the lightest, most compact, and most widely deployed 5-inch fully automatic naval gun in the world, with more than 260 deliveries to the US Navy and the navies of 10 other allied nations.

The Mod 4 configuration consists of a structurally strengthened gun mount that increases firing energy by 50%, enabling munitions to travel faster and farther. A new fully digitized control system provides significantly greater computing power and features a touchscreen user interface.

📷 UK MoD



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# IBIS®

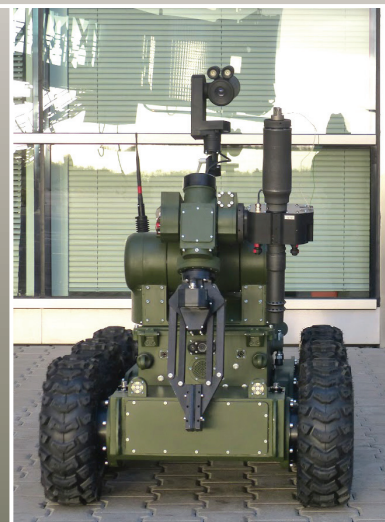
## ROBOT FOR PYROTECHNIC OPERATIONS AND RECONNAISSANCE



**IBIS® is a robot for pyrotechnic operations and reconnaissance. Upon installation of additional devices, it can be used, among others, for disposal of dangerous objects, chemical detection and rescue operations. Six-wheeled chassis with independent drive of each wheel allows to operate in challenging and varied terrain (bedrock, wetlands, muddy terrain and debris).**

IBIS® is a fast robot (10 km/h). Special design of mobile base suspension ensures optimum wheel contact with the ground. Precision drive system ensures fluidity of the movement of every part of the robot, at any speed.

Manipulator with extendable arm ensures a large reach (over three meters) and a high range of motion in each plane. The manipulator lifts loads weighing up to 50 kg.



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# UK TO DEPLOY TROOPS TO MALI

The Defence Secretary has announced that UK Armed Forces will deploy to Mali in 2020 in support of the UN Peacekeeping Operation.

In recognition of the increasing instability in the Sahel region, the UK Government has authorised a large-scale British peacekeeping deployment to Eastern Mali. Based in Gao, 250 personnel will deploy in response to a UN requirement and will address a key capability gap for the UN Mission.

Initially deploying for three years as part of a 12,500 strong international force, the UK contribution will assist the UN mission as it seeks to deliver long-term and sustainable peace in Mali.

UK personnel will operate alongside troops from more than 30 countries, and will deliver a long-range reconnaissance capability, providing greater awareness of possible threats and contributing to the protection of civilians.

'UK service personnel will work with our partners in the region to help pro-

mote peace by combating the threat of violent extremism and protecting human rights in Mali', said Defence Secretary, Penny Mordaunt.

This targeted contribution will be complemented by UK staff officers in the UN mission headquarters and new training programmes with troops from other partnering nations who will be deploying to the UN operation.

The UK currently has around 600 personnel deployed on peacekeeping operations

and is the 6th largest contributor to the UN peacekeeping budget. The UK is the lead contributor to the UN mission in Cyprus and in 2020 will conclude a 4-year troop deployment to South Sudan.

As part of the wider package of support offered to the region, the existing commitment of three UK Chinooks and accompanying personnel deployed in support of the French-led counter-terrorism operation in Mali have been extended by six months.

UK MoD



# RAF FIGHTERS OVER ESTONIA

RAF Typhoon fighter jets operating from the Ämari Air Base in Estonia were launched on Sunday, 28th July, to intercept a Russian IL-76 military transport aircraft that was flying close to the Estonian airspace. According to the Royal Air Force (RAF), this is a routine NATO mission for the Typhoons, which provides reassurance that the UK is here to work in partnership with Estonia. 'As this latest Quick Reaction Alert demonstrates, the RAF is frequently called upon to use their world class skills and capabilities to help police and protect the skies over the Baltics', said Ben Wallace, UK Defence Secretary. 'Our personnel deployed to Estonia and around the world are always ready

to react to any scenario as we continue our commitment to our NATO allies', he added.

A Typhoon pilot from the XI(Fighter) Squadron, attached to 121 Expeditionary Air Wing (EAW), was conducting a Quick Reaction Alert (QRA) duty when the scramble was called:

'We were scrambled to intercept an aircraft that was approaching the Estonian airspace from the south. We identified and monitored it as it transited close to NATO airspace. This is standard protocol for aircraft that might not be communicating with Air Traffic Control or on a recognised flight plan', said a pilot



of the XI (F) Squadron. 'We continued to escort the transport aircraft as it transited in a north direction, away from the Estonian airspace', he added.

RAF



# FINAL MRAPS FOR EGYPT



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# SUCCESSFUL ARROW TEST



The Israel Missile Defense Organization (IMDO) of the Directorate of Defense Research and Development (DDR&D) and the US Missile Defense Agency (MDA) completed a successful flight test campaign with the Arrow-3 Interceptor missile.

Flight Test Arrow-01 demonstrated the Israeli Arrow Weapon System's ability to conduct a high altitude hit-to-kill engagement. Interceptor tests were conducted that successfully destroyed target missiles. These tests were conducted at Pacific Spaceport Complex-Alaska (PSCA) in Kodiak, Alaska.

The Arrow-3 Interceptor successfully demonstrated an engagement capability against the exo-atmospheric target during the test. Although not part of the Israeli architecture, an US AN-TPY2 radar participated in the test. Preliminary analysis indicates that test objectives were successfully achieved.

The Arrow Weapon System is a central part of Israel's multi-layer defense system. The defense system is based on four operational layers: Iron Dome Defense System, David's Sling Weapon System, the Arrow-2, and the Arrow-3.

'These successful tests mark a major milestone in the development of the Arrow Weapon System', said MDA Director Vice Adm. Jon Hill. 'This unique success in Alaska provides confidence in future Israeli capabilities to defeat the developing threats in the region. My congratulations to the Israel Missile Defense Organization, our MDA team, and our industry partners. We are committed to assisting the government of Israel in upgrading its national missile defense capability to defend the State of Israel from emerging threats', he added..

MDA

# STRYKER ICVS FOR THAILAND

The State Department has approved a possible Foreign Military Sales of 60 Stryker infantry carrier vehicles to Thailand with equipment and support for an estimated cost of \$175 million.

According to the Defense Security Cooperation Agency (DSCA) the Government of Thailand has requested to buy sixty Stryker Infantry Carrier

Vehicles (ICV) and sixty M2 Flex .50 cal machine guns. The deal will also include spare parts, Basic Issue Items (BI), Components of End Items (COEI), Additional Authorized List (AAL) (specific items for operations and maintenance), Special Tools and Test Equipment (STTE), technical manuals, OCONUS Deprocessing Service, M6 smoke gre-

DSCA declares that the proposed sale will support the foreign policy and national security objectives of the United States and help to improve security of a major Non-NATO ally in INDO-PACOM region. The Stryker vehicles will increase Thailand's capability to defend its sovereign territory against traditional and non-traditional threats, by filling the capability void between light infantry soldiers and heavy mechanized units. Thailand should have no difficulty absorbing this equipment into its armed forces.

It is expected that this proposed sale will not alter the basic military balance in the region. The principal contractor for the Stryker vehicle is General Dynamics Service Representatives Land Systems. There are no known offset agreements proposed in connection with this potential sale.

US Army





# HMS DUNCAN ARRIVES TO THE GULF



The Royal Navy's HMS Duncan, the sixth and last of the Type 45 air-defence destroyers, has arrived to the Persian Gulf to support the safe passage of British-flagged ships through the Strait of Hormuz.

Type 45 destroyer, HMS Duncan, will work with Type 23 frigate, HMS Montrose, until she comes off duty in late August, ensuring the continuous availability of ships to accompany merchant vessels. 'Freedom of navigation in the Strait of Hormuz is vital not just to the UK, but also our international partners and allies', said Defence Secretary, Ben Wallace.

'Merchant ships must be free to travel lawfully and trade safely, anywhere in the world. I'm pleased that HMS Duncan will continue HMS Montrose's fine work in helping to

secure this essential route. While we continue to push for a diplomatic resolution that will make this possible again without military accompaniment, the Royal Navy will continue to provide a safeguard for UK vessels until this is the reality', he added.

'HMS Duncan has arrived in the Strait of Hormuz to continue the outstanding work to protect British maritime interests conducted by HMS Montrose and the United Kingdom Maritime Component Commander's staff in Bahrain. HMS Duncan has shown the true flexibility of the Royal Navy by moving at pace to this area of operations', said Commander Tom Trent, the Commanding Officer of HMS Duncan.

'We have relocated from an intense deployment in the Mediterranean and Black Sea, which included support to

the French carrier strike group with live operations in Syria. The Royal Navy continues to deliver consistent, enduring and world-class capability in the region – HMS Duncan is proud to support this vital operation and ready to play her part', he added.

HMS Montrose covers an operating area of some 19,000 nautical miles. She has so far accompanied 35 merchant vessels through the Strait during 20 separate transits, travelling 6,200 nautical miles in the process.

Later in the year, another Type 23 Frigate, HMS Kent, will take over this tasking from HMS Duncan. HMS Montrose will remain stationed in the Middle East until 2022 as part of the Royal Navy's permanent presence in the Middle East.

UK MoD



# PRESENT AND FUTURE





# OF POLSKA GRUPA ZBROJENIOWA

Interview with  
**Witold Słowik,**  
CEO of Polska Grupa Zbrojeniowa

*Polska Grupa Zbrojeniowa (PGZ) aspires to be one of the largest arms manufacturers in Europe. Could you present the key development routes planned by PGZ, especially those connected with the building domestic competences, for the next decade?*

PGZ has an enormous variety of products, ranging from service weapons, optoelectronic equipment, tactical gear, up to artillery systems, armored personnel carriers, or modernization packages for Soviet-made helicopters and tanks. We don't want to give up on any of those segments. The most important for the future are the anti-aircraft and anti-missile systems, armored and wheeled vehicles, autonomous systems and battlefield management support solutions. For these, we see the biggest export potential. Domestic offer is somewhat similar but encompasses a broader range of products which is a direct result of modernization plans for the Polish Armed Forces.

*Polska Grupa Zbrojeniowa has been the biggest, commercial exhibitor at the MSPO for years. What do you consider the most important presented product for 2019?*

We are involved in many negotiations and technical dialogues so I can't point to a single product. This year's display contains many solutions which are of interest for both foreign and domestic parties. We have conventional and rocket-based anti-aircraft systems, modular tank destroyers, Rosomak BMS system on a wheeled personnel carrier chassis and, obviously, our Borsuk with ZSSW-30 turret.





The display also contains products developed for the Titan program. Visitors can also see the new, heavy armored recovery vehicle from Siemianowice. This is only a part of our display at this year's MSPO.

*The rebuilding of the multi-layer air defense systems for Poland is considered one of the priorities. How would you rate the PGZ capabilities for delivering bespoke solutions for Wisla and Narew programs?*

We are the main industry partner for the Wisla program and the work is proceeding according to procedures set by Foreign Military Sales regulations. We are aiming for the biggest business benefits which can be illustrated by the recent agreement concerning the manufacturing of DLTM modules in the Wojskowe Zakłady Elektroniczne from Zielonka. For the Narew program, we are declaring complete readiness for delivery of domestic solution based

on proprietary communication and command system which is fully compatible with IBCS by the means of so-called A-kits. This is based on both economic and national security reasons. PGZ as a national integrator is a key for correct explanation and modernization of this system, guarantees future users needs and gives certain autonomy when sales to other markets are concerned. The markets themselves are deeply interested in such systems.





*Will the currently developed by MESKO Piorun man-portable air defense system be introduced into the Polish armed forces? Is the design mature enough to become a part of PGZ's export portfolio?*

Deliveries of Piorun system to Polish Armed Forces started at the end of 2018 and the program itself is currently ongoing, accordingly to the agreements with the ordering party and the schedule. The Piorun's predecessor, Grom, was sold to, amongst others, Georgia, Lithuania, and Indonesia, as a part of Kobra very short-range anti-aircraft system. Pioruns, as a portable anti-aircraft system, is covered by very restrictive export law such as the Wassenaar Treaty, which Poland has signed. It's important to also

remind that the rights and technical documentation of Pioruns belong to the Polish Armed Forces. The system is completely mature, we have it in our offer and certain countries confirmed their interest in it but due to non-disclosure agreements, we can't say who precisely is interested.

*When looking at the recent acquisitions of the Polish Armed Forces, it's visible that the Lockheed Martin has a dominant role. Do you treat the company's current position in Poland as a benefit or a threat to PGZ?*

We openly say that neither now, nor in the near future, Poland will be able to produce 5th generation fighter planes or tactical, antiballistic missiles. As such, these systems have to be procured from the biggest players in the world's market.





However, each situation has a solution beneficial for all sides: the industry which aims for profits and improved competencies, the armed forces which require the most capable equipment, and obviously the government, which has to balance the interests of each party and maintain the budget. We reach this with the offset agreements, MON-negotiated relocation of manufacturing facilities into the country and the technology transfers.

*Lot has been lately said about the limited modification of the Polish T72M1's. Knowing the potential of PGZ, are You satisfied with this? What will really be handed over to Polish tankers when the work is completed?*

The industry proposed a lot of offers concerning this over the years. Some of these were wider the current plan,

which is a compromise between costs, needs, and final effect. If this issue would be worked out 10-15 years ago and if the further development of the PT-91 tanks wouldn't be stopped right after the tank's delivery, we would be in a different situation now. The current development program of conventional artillery serves as a great example. This branch of the Armed Forces planned well ahead and consequently acquired equipment matching their requirements. As a result, we are currently delivering firing modules of Krab's and Rak's which are one of the most modern artillery systems in the world. It's impossible to retire hundreds of tanks in one day just to replace it the next day with new vehicles. The T-72 modification will allow both the army and the industry an easy transformation, without loss of competences and the skills of tank crews.

*Recently You declared a will to renew the development process of the new, Polish tank. Who would you consider as PGZ's strategic partner in the endeavor? Which components could be manufactured domestically and which would have to be imported? I'm mostly interested in the turret, cannon and stabilization systems, powerpack, armor (including reactive armor), chassis, fire control systems, and active and passive defensive systems.*

The decision to involve PGZ in the development of the new Polish main battle tank involved both the nation's security aspects and the business ones. Armed Forces require a couple of hundreds of tanks and support vehicles. Such scale of the program justifies the involvement of domestic arms industry.

Our partner companies have potential in manufacturing of vehicles



bodies, suspension, parts of the electronic and optoelectronic systems. We are growing our competencies in barrel manufacturing, battle management systems and have a promising development in the active defense systems field. Of course, we can't do it all alone but there is hardly any weapon system of such complexity which has been developed by a single state's defense industry. We don't say we want to do it alone and we see the need for cooperation with domestic and international partners.

Models for such cooperations vary from industry partnerships, joint R&D work, procurement of technical

documentation, Polonization, or licensed manufacturing. Such complicated programs are effected in the world using all these tools and everything is created as a part of delivery chains. Besides the choice and collection of parts, integrator role is a key one and PGZ should have this role in the tank project. It's not only a matter of physical integration but also logical integration and wetronics work. All this is necessary for all the elements to work and cooperate as a part of a single system which will guarantee the soldier's safety and give them the necessary tools to complete the required tasks.

We expect the Polish Armed Forces to precisely describe their requirements and technical-technological assumptions. The government should support us in international negotiations. We want to complete such a prolonged program because we can see the enormous potential which, together with government and Armed Forces, can be exploited for mutual benefits.

*We cannot omit the concept of infantry fighting vehicle and the support vehicles developed by PGZ. Is there any breakthrough on the horizon?*







The Borsuk program is the breakthrough. Polish industry successfully completed an ambitious task to create an amphibious, tracked vehicle which is well protected against ballistic and explosives threats. The ordering party requirements were, and are, challenging. And it wasn't a single task - a huge consortium had to be created and managed. The consortium consisted of numerous industrial and scientific entities, with different profiles and potential. Research and development work had to be planned and completed while balancing the interests of

military, state-owned, and private entities. Such a project is a titanic challenge and it was crowned with the Borsuk prototype - one of the most modern of such vehicles.

But the prototype isn't the end of the road. We are developing a heavier variant of the vehicle and analyzing the platform's potential. This required creation of "modernization space" and will allow other variants such as support vehicles or medevac vehicles to be created. Borsuk is a very versatile platform which we can utilize for many tasks while supporting the

needs of the Polish Armed Forces and other allied forces.

*State of the Polish Navy has been a worry for experts for many years. Will Polska Grupa Zbrojeniowa be involved in new Navy projects any time soon, considering especially with Czapla, Miecznik, and Orka programs.*

Industry's role isn't to create a concept of the use of armed forces. The industry should deliver solutions which will allow armed forces to effect these concepts. Projects are





*service rifles and VIS 100 service pistols. Can you say something about the RGP-40 revolver grenade launchers and precision rifles which are currently under development by Fabryka Broni and Zakłady Mechaniczne Tarnów?*

The whole process is successful. The cooperation with ordering party, i.e. Wojska Obrony Terytorialnej, is ideal. MSBS rifle is a system which is continuously under development. We also know that other branches of the Armed Forces are eagerly awaiting their new service weapons for both 5,56x45 mm NATO and 7,62x51 mm NATO ammunition. We have solutions for each segment which we present to the ordering parties.

As to the grenade launchers, ZMT is planning sales to Polish uniformed forces. This will hopefully happen next year. We are also searching for foreign buyers who could receive their orders very quickly.

*For the conclusion, would you be able to point out the most innovative projects that the PGZ is currently undertaking?*

developed according to requirements set by the ordering party. As PGZ we have the potential to work within the mentioned programs. I'd like to remind that shipyards act as integrators of equipment and armament, they don't build the surface and subsurface weapon systems, powerplants or radars. All this equipment isn't manufactured next to the slips and docks.

When it comes to surface vessels, we can rebuild our potential and capabilities to launch own vessels in which will fulfill the Navy's requirements. To do this

we require cooperation with a foreign shipyard, design bureau and a technology transfer.

We are also capable to take part in the construction of submarines, also in a partnership model. Self-reliance in repairs, servicing, and maintenance of vessels and on-board systems is a key issue for the Navy's continuous operation.

*How do you rate the pace of work on the introduction of service firearms manufactured by PGZ's partners? The army is buying the Grot C16 FB-M1*

We are conducting projects in many spheres and throughout the whole world, we are seeing revolutionary ideas. I'm talking about things such as autonomous systems, battlefield management support systems, active defense systems for vehicles, new communication and reconnaissance technologies, programmable munitions, or energetic weapons. We conduct these projects on our own, as industry partners, and together with civilian and military R&D centers.

*Thank You for the interview*

*Interviewer: Jakub Link-Lenczowski*









# POLAND IN NATO

## 20<sup>TH</sup> ANNIVERSARY

When Bill Clinton, the former president of the USA, visited Warsaw in 1994, he stated that NATO's extensions to Eastern Europe isn't a question of if, but when and how.

Just a year later, the U.S. Congress approved the accession of Czech Republic, Poland, Slovakia and Hungary into NATO structures.

The right moment came in 1999, shortly before the North Atlantic Treaty Organization celebrated the 50th anniversary of its formation, when Poland became a full member of Alliance

Accession to defense structures of the 'Western world' was challenging for the Polish Armed Forces, which for the past several dozen years were shaped in accordance with Soviet standards. At the end of 1990', the Polish Army was based on conscript soldiers, which created a number of difficulties in setting up rules and procedures for cooperation with professional armies of the North Atlantic community. While a handful of Polish Army's units were familiar with the requirements of cooperation with foreign partners



on the international scale, thanks to their involvement in the past in UN's peacekeeping missions all around the World, an overall 'quality revolution' had to be conducted in order to prepare the Polish Armed Forces as a whole to meet the future challenges.

## STRUCTURAL TRANSFORMATION

In the 1990' Poland was undergoing an overall transformation from Eastern to Western standards, which affected all aspects of the state government and the life of its citizens. The Armed Forces were no stranger to this transition, as the budget of the Ministry of Defence (MoD) was severely affected by overall cuts, leading to a number of difficulties

in modernizing and reforming the military structure.

One of the biggest milestones in the process of transition of the Polish Armed Forces was achieved, when conscription was abolished and the nature of the Army was based on voluntary service, just like in most of the other NATO member states. By that time it became clear that enrolled members of the armed forces did not provide the same quality of service and efficiency on the battlefield as professional soldiers.

Despite all of these difficulties, Poland continued the efforts to modernize its Armed Forces on strategic and tactical levels. A big focus was put on enhancing capabilities of cooperation with Western allies during expeditionary operations, which led to sending Polish troops to a number

of peacekeeping or peace enforcing missions in Latin America, the Balkans, Afghanistan and the Middle East, launched under the auspices of international organizations like NATO or UN.

Involvement in expeditionary, multinational operations required from Polish soldiers gaining a number of new skills, which were decisive in order to establish efficient methods of cooperation with Western partners. This included communicating with allied forces in English language on a daily basis or adjustment to certain procedures standardized throughout the Alliance. Each year, more and more Polish soldiers went through training and education courses, which helped them to better adapt to Western military standards and meet the requirements of cooperation within NATO structures.







## NEW STANDARDS AND TECHNICAL MODERNIZATION OF INVENTORY

Along with training and improving skills of soldiers and officers, Poland had also to make significant investments in modernization of its military equipment, dominated by legacy, Soviet-era weapon systems. Although this situation related to all branches of the Armed Forces, the biggest pressure was put on the technical transformation of the Air and Land forces, which had to start the process of phasing out obsolete equipment and replacing it with modern, Western-designed systems, like F-16C/D Block 52+ multirole fighter aircraft, which Poland acquired in the 2000' in place of legacy MiG-21 fighters.

The process of technical modernization of Poland's combat aircraft fleet will be continued in the coming years, as the country plans to start gradual phase out of legacy Su-22 bombers/fighters and MiG-29 fighters, and replace them with several dozen of F-35A Lightning II multirole fighter jets.

Today, the main structure of the Polish Armed Forces is composed by a mix of Western and Soviet equipment, with the latter planned to be phased out in the coming years. For example, the Polish Army operates modern Leopard 2A4/A5 main battle tanks, as well as Rosomak/Patria AMV 8x8 wheeled armoured vehicles, but at the same time desperately looks for replacement of its fleet of several thousand legacy tracked infantry fighting vehicles or new tank destroyers.

The Air Force, although it was the biggest beneficiary of the overall modernization programme, still requires much investment in its inventory, as legacy, Soviet-era combat aircraft cannot any more fulfill the requirements of the modern battlefield, and their further use is becoming hazardous due to worsening technical condition and obsolescence of onboard equipment.

Perhaps the Polish Navy is the only branch of the Armed Forces, which seems to be left out in the transformation process, as most of its combat fleet is based on obsolete, Soviet-era designed platforms, with the exception of two Oliver Hazard Perry-class frigates acquired from USA and a number of ex-Norwegian Kobben-class diesel-electric submarines, both of which were designed during the Cold War.







## SOF, POLAND'S NEW SPECIALITY WITHIN NATO

The Polish Special Forces branch is a different case, as from the very beginning, it was formed, based on the advice and expertise of British and U.S. allies. Over the years, soldiers of the Polish SOF took part in a number of military operations all around the World, proving their efficiency, skills and professionalism during missions in Haiti, the Balkans, Afghanistan and the Persian Gulf.

Over time, special forces operations became Poland's speciality, with five operational detachments JW Grom, JW Komandosow, JW Formoza, JW AGAT and JW NIL, serving in the country and abroad along with partners from other NATO member states. More and more often Polish SOF operatives are being tasked with planning and coordination of combat operations conducted by

multinational task forces in NATO's area of responsibility.

The overall assessment of Poland's 20 years of NATO membership should be conducted on several grounds. From the political point of view, accession to the North Atlantic Treaty Organization was a significant shift from Eastern to Western political block, allowing for the country to transform into a modern, Western-style democracy.

In case of the military, by joining NATO Poland gained access to proven, Western standards and procedures, which it could implement, significantly enhancing operational capabilities of its armed forces and strengthening country's security. Polish Armed Forces could train and improve their skills in partnership with Western allies and commence a gradual transformation of its inventory, acquiring a number of highly capable weapon systems, which it lacked so far. 





CAMM IS JUST A





# A BEGINNING

AN INTERVIEW WITH THE DIRECTOR  
OF MBDA IN POLAND

**JAN GRABOWSKI,**  
THE DIRECTOR OF **MBDA**  
**IN POLAND,** TALKS WITH  
THE MILMAG MILITARY  
MAGAZINE ABOUT MBDA'S  
VISION OF COOPERATION  
WITH POLAND AND POLISH  
DEFENCE INDUSTRY IN  
REGARDS TO POLISH ARMED  
FORCES MODERNIZATION  
PROGRAMMES AND THE  
PROSPECTS A STRATEGIC  
PARTNERSHIP ON  
A GLOBAL SCALE.

How does MBDA perceive Poland as a potential export market? Which of the Polish modernization and procurement programmes, the ones, which are already ongoing and the ones which are yet to be started, do you see as most attractive?

Poland has been one of the strategic markets for MBDA for many years and we have been participating in different modernization programmes here. We know how to operate in Poland and what the customer wants. We see our most exciting chance, which is also a chance for Poland, to have a partnership on the newest antiaircraft/antimissile defence system in Europe called CAMM from the Narew programme. That's one thing.

There is, of course, the tank destroyer, the newest technical dialogue announced by the Ministry of Defence (MoD) and the Armament Inspectorate. We take part in this





technical dialogue with our Polish industrial partners. What is important is that MBDA signed a strategic cooperation agreement with the Polish Armaments Group (PGZ) in 2017. This agreement set ways to cooperate in the development of missile systems.

We believe PGZ sees the value of a strategic partnership with MBDA, and MBDA sees PGZ in the same way. That gives us this opportunity and vision of Poland as a strategic market for MBDA.

We have been created since early 1950' until today from the cooperation between the different nations. In the beginning, it was France and Great Britain. Then it

was also Germany and Italy. And now, for the last 3-4 years we also have MBDA Spain. We believe that Poland could be another great partner in missile system development in Europe.

Another important programme for us is also Harpia, where F-35 might be acquired by the Polish MoD and we already did the integration works together with our industrial partners in the UK and US for F-35s. There are many opportunities when it comes to F-35. We have already integrated our ASRAAM missile on F-35, for example, and are in the process of integrating both our Meteor and SPEAR missiles.

And what is important, ASRAAM is 75% CAMM. So we have this synergy that if Poland would take CAMM onboard for the Narew programme, then 75% of ASRAAM is already here being made in Poland.

There is also Rybitwa, Pustelnik and Karabela. There are many modernization projects, which are ongoing or they are somewhere in the technical dialogue phase. But we have given the answer to our RFIs (Requests for Information) to the Armament Inspectorate for Pustelnik with Enforcer, for Karabela with MMP and for the tank destroyer with the Brimstone missile.



In terms of the Narew programme, aside from the effector missile itself, what would your offer include in terms of the surveillance systems, tracking systems, combat management system (CMS), launchers and all of the other auxiliary equipment?

Well, we are going here into very precise details, which are not supposed to be known to the public. What I can say is that our proposition is comprehensive and all of these details were given to the Polish government in 2017. They were given to the Polish industry also, because the Polish industry, especially the PGZ, is a strategic partner in Poland for MBDA. It's the PGZ and its companies, grouped in the PGZ Narew consortium, which is the leading body for that project.

Which components of the Narew system, that you offer, could be manufactured locally by your Polish partners within the PGZ?

We try to cooperate with every company in the PGZ and we know where we can cooperate straight away, and where we can cooperate in time once we have transferred technology and know-how.

We are already taking practical steps, whether it's study visits, exchanging documents, assessment when it comes to real production of ongoing products for MBDA with a wide number of PGZ companies, including Pit-Radwar, the whole group of companies under Mesko, Jelcz, HSW, CTM and WZE in Zielonka. From all these companies we know which parts of the system production they can be good at or what they are already good in what they are doing, so







The Polish MoD wishes to have both of the air-and-missile defence systems, the medium range Wisla and short range Narew, compatible and both operated under the same CMS, which in the first place will be designed and procured in regards to the Wisla system. Will this requirement lead to any modification of the CAMM from MBDA's perspective?

For now Wisla and Narew should have the same combat management system. The CMS for Wisla is the ICBS from Northrop Grumman. MBDA is the first non-American missile company that can operate its systems together with IBCS. It is a well-known fact that MBDA, Northrop Grumman and PGZ are open to cooperate when it comes to the joint CMS for Wisla and Narew, because MBDA is already beyond the test phase with IBCS. But of course, it is the decision of the Polish MoD which system they would like to implement. We want to help Polish industry and the Polish client in picking the best solution for the Polish Army.

**I assume that this also includes the radar systems, which Poland wants to develop independently for the Narew programme?**

Yes.

**When do you expect the decision of the Polish MoD on the Narew programme?**

When it comes to the safety of Poland and Polish modernization processes, I would expect it by the end of this year. We've been present in Poland, just as I said, for the last 10 years. Since 2018

what components and products from their portfolio can be taken onboard to Narew.

What is also important, when it comes to these components is we do not close our mind only for Narew, when it comes to cooperation with PGZ companies. PGZ has real strength and has some special competences that we well recognize. We would like to join forces when it comes to some products and have a common offer for the third markets, based on Narew. But, Narew is only the beginning. And maybe there are some projects, which I've already mentioned, which could be implemented faster than Narew.

**Does your offer include transferring of the production of the Narew system's effector directly to Poland?**

MBDA is built on international cooperation and exchanging ideas and knowledge between European nations. Therefore MBDA wants to put production of the effector into Poland and with Polish industry. MBDA already sees some companies that might be responsible for the production of the effector, but of course the final decision lies with PGZ. So yes, after some preparations, the effector from the CAMM family of missiles will be produced in Poland.

**Are you allowed to disclose, which companies are being taken into consideration in terms of production of the effector?**

I don't think so. But we know the PGZ's companies that are responsible for missile production are capable of receiving the technology from MBDA.



we have a representative office in Poland and what is important, MBDA has offices like this in just 6 countries in the world. This is the first in the Central and Eastern Europe. So, I think it shows how important Poland is for MBDA and also shows our vision of European cooperation when it comes to missile systems. Hopefully, Narew might be signed this year.

### What other modernization programmes of the Polish Armed Forces do you perceive as potential sales opportunities for the CAMM family of missiles?

It depends on which programmes from the Technical Modernization Plan the Polish MoD would like to implement first. We see CAMM missile and its naval Sea Ceptor system, which, by the way, is already installed on Her Majesty's ships of the Royal Navy, as multipurpose, multiplatform missiles. Sea Ceptor might be an option of the Orkan, Miecznik or Ślęzak programmes. We are open

to help PGZ in implementing these missiles on different platforms.

### How do you see the process of Poland joining the MBDA family and becoming another NatCo country?

It depends on the wishes of the Polish government and industry. It also depends on our shareholder's decision. MBDA is owned by three big global market players: BAE Systems, Leonardo and Airbus Group. All these players are present all over the world. We consider Poland as a strategic market and Polish industry as a strategic partner. We think that if Narew would be implemented and done together with MBDA, for us as a company which has international cooperation in our DNA, it could strengthen our efforts also legally speaking [and lead to the creation of a Poland-based MBDA subsidiary – MILMAG].

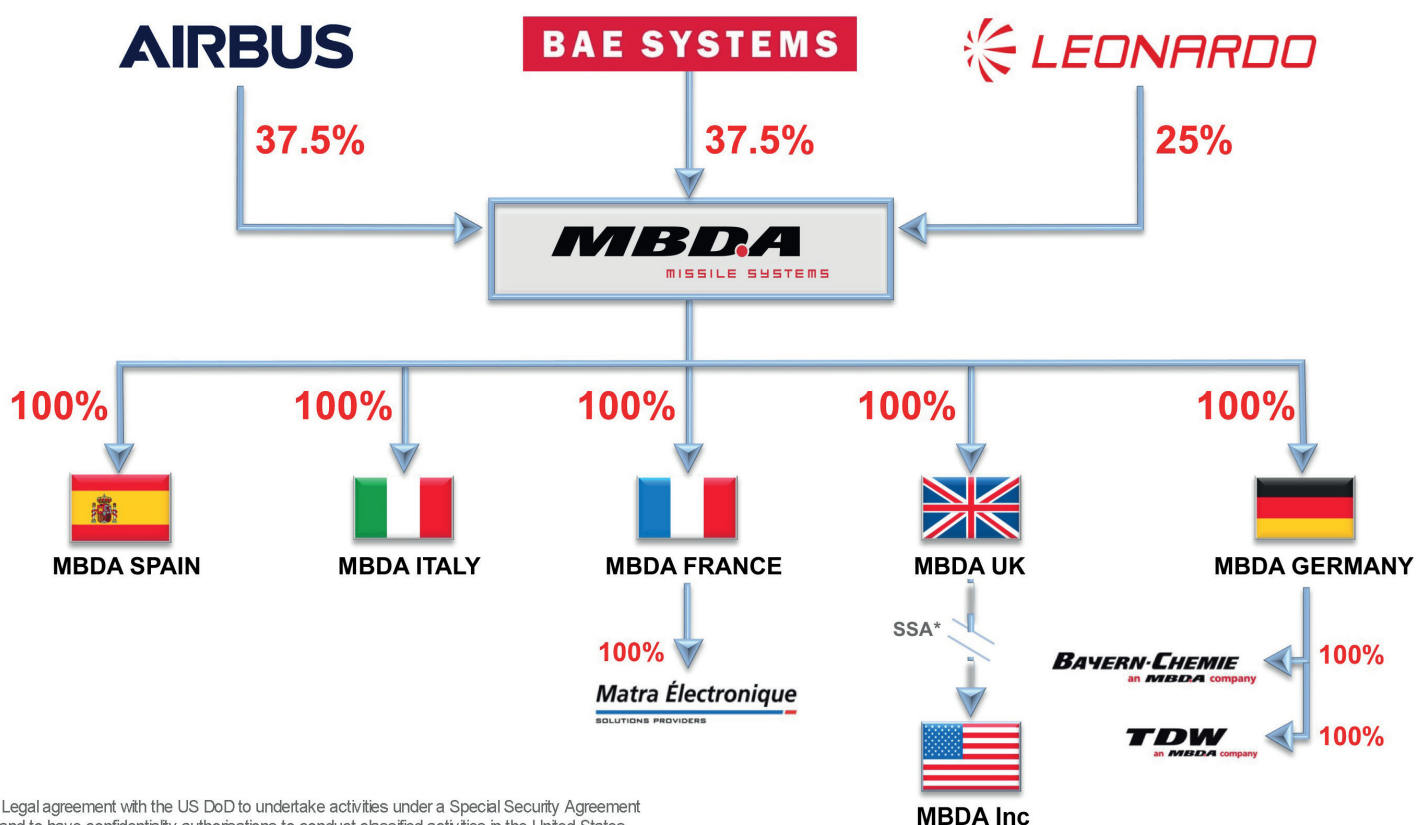
It could be a completely Polish entity or it can be a 50%-50% company, or something else. Everything depends on the clients' wish and how this knowledge from MBDA would be

implemented into the Polish industry. What we can say is MBDA wants to cooperate with Poland on the long term and we want to co-develop with Polish industry. CAMM could only be the beginning.

### What will this cooperation mean for the Polish industry?

Cooperation with MBDA means for Polish industry and the Polish State that Poland will become a real partner and a real producer of high-end missile systems for Poland, of course, but also for the third markets and Polish industry will become a real strategic partner for MBDA and its partners as it is a group of companies. There is a lot of knowledge, a lot of technology, a lot of different products for different platforms and clients. Polish industry also has many strengths and special competencies and can help us to widen our portfolio. It means that we will be equal in this cooperation between MBDA and Polish industry, between MBDA and Poland. 

Interviewer: Jakub Link-Lenczowski



\* Legal agreement with the US DoD to undertake activities under a Special Security Agreement and to have confidentiality authorisations to conduct classified activities in the United States



# F-35



Poland enhances capabilities with a lightning strike acquisition



# FOR POLISH AIR FORCES



In early September the U.S. State Department approved the sale of thirty two F-35A Lightning II multirole fighter jets to Poland under the Foreign Military Sales (FMS) procedure. The future contract is valued at \$6.5 billion. This potential transaction has yet to be certified by the U.S. Congress.





©Tech. Sgt. Matthew Plew, USAF

The intention of the Polish MoD is to increase the number of F-35s in the Air Force's inventory to 48, which would make up for the same number of currently operated F-16C/D Block 52+ jets

According to the Defense Security Cooperation Agency (DSCA) under the contract for sale of thirty two F-35 fighter jets Poland will also acquire: thirty-three Pratt & Whitney

F-135 Engines, Electronic Warfare Systems, Command, Control, Communications, Computer and Intelligence/Communications, Navigation and Identification

(C4I/CNI), Autonomic Logistics Global Support System (ALGS), Autonomic Logistics Information System (ALIS), Full Mission Trainer, Weapons Employment Capability





transaction. Furthermore, new fighter jets and auxiliary equipment will be delivered to Poland in partnership with U.S. Armed Forces, which will also assist in the training of the first batch of Polish pilots and maintenance personnel.

## THE FUTURE OF POLISH AIR FORCE

The future Polish 5th generation fighter jets will be procured under the *Harpia* programme, which was re-prioritized and initiated by the Polish Ministry of Defence (MoD) late last year. Originally, the ministry intended to launch an open, international tender, which would allow for a number of Western manufacturers to submit their offers and present the advantages of many fixed-wing combat platforms, which are available on the market.

This process would help the Polish authorities to consider and evaluate a number of sales opportunities and select the ones, which in the best way meet the requirements of the Polish Air Force. Furthermore, the open tender procedure could also fuel the competition among bidding companies and force them to modify their offers in order to attract the Polish authorities, e.g. by lowering the acquisition cost.

However, in the beginning of 2019 the Polish MoD has publicly announced its intention to procure the U.S.-manufactured F-35 fighter jets in the Conventional Take Off and Landing configuration, ceasing the tender procedure, which most likely had not even fully commenced yet by that time. Furthermore, on 28th of May, Mariusz Błaszczak, the head of the Polish MoD, announced via social

and other Subsystems, Features, and Capabilities, F-35 unique infrared flares, reprogramming center, F-35 Performance Based Logistics, software development/integration, aircraft ferry and tanker support.

The sale will also include: support equipment, tools and test equipment, communications equipment, spares and repair parts, personnel

training and training equipment, publications and technical documents, U.S. Government and contractor engineering, logistics, and personnel services, and other related elements of logistics and program support.

The future contract will be finalized under the FMS procedure, which means that the U.S. government will partake in the



media that his department had already sent a Letter of Request (LoR) to DSCA in this regard.

'I treat this assignment as a priority. I care about replacing the Soviet-era equipment in the Polish Air Force with a more modern one' said Mariusz Blaszczyk.

In early 2019 Wojciech Skurkiewicz, the Secretary of State at the Polish MoD, suggested that the first batch of sixteen F-35 fighters could enter service in the Polish Air Force by 2026. Another batch, comprising of the same number of aircraft, should be acquired at the latter date, most likely by 2035.

It is also expected that the fleet of Polish 5th generation fighter jets will eventually increase, as the MoD has already suggested that it might acquire another batch of these aircraft in the future. According to Skurkiewicz the department intends to bring the total number of Polish F-35s to 48, which would complement the same number of F-16C/D Block 52+ jets, that are currently operated by the Polish Air Force.

## MODERNIZATION UNDERWAY

The *Harpia* programme is intended to speed up the technical modernization of Polish Air Force's combat fleet. Acquisition of new, 5th generation fighter jets will allow to commence the gradual phase out of currently operated, legacy platforms, such as the Su-22 bombers/fighters and MiG-29 fighters. Due to worsening technical condition and obsolescence of their onboard equipment, these aircraft no longer meet the requirements of the modern battlefield.

Furthermore, a growing number of accidents, which had occurred during the last couple of years and

resulted in the loss of several of MiG-29 fighters, led the Polish MoD to the conclusion, that further usage of Soviet-era aircraft is pointless and could only lead to a gradual decrease of Polish Air Force's operational capability.

Although the acquisition of the 5th generation fighters seems to be on the fast track, it still will require a significant part of the time, until new Polish combat aircraft reach the final operational capability. In the meantime, the Polish airspace will most likely be protected by only a fleet of 48 F-16s, as further use of Su-22s or MiG-29s seems pointless,

because they require constant overhaul and repairs and do not provide requires operational efficiency.

## ACQUISITION PROGRAMMES HAMPERED

Although the final value of the contract for the acquisition of F-35s will most likely be scaled-down during future negotiations, the cost of this programme will still have a significant effect on MoD's budget and could jeopardize a number of other Polish modernization programmes. Especially if the decision






will be taken to finance the F-35 procurement through the MoD's own budget and not a separate, government-level allocation.

On top of projects, which might get hampered, stopped or even cancelled, is the 2nd phase of the *Wisla* medium range air-and-missile defence programme, that calls for the procurement of another six batteries of the Patriot system along with a new 3D radar, CMS and a number of low-cost effectors. *Wisla* is expected to be supplemented by the *Narew* short range air defence system. Its acquisition, although

being depicted by the MoD as one of priorities, is also considered as uncertain.

The future of the Polish attack helicopter fleet also does not look bright, as the planned procurement of a number of rotary-wing platforms under the *Kruk* programme has been stalled for years. The same problems are faced by the Polish Navy, which

has a requirement for a fleet of modern submarines, frigates and corvettes, that, however, has not yet been met by the MoD. 



 MICHAŁ JAROCKI

Acquisition of 5th generation multirole fighters will significantly improve the operational capabilities of the Polish Air Force, making it able to better commit to the security of Poland and NATO and meet the requirements of the modern battlefield





# CZECH ARMED FORCES

IN THE MIDST  
OF TECHNICAL  
MODERNIZATION







With the goal set for procurement of a number of new, modern weapons systems in the next couple of decades, the Czech Armed Forces seem to be on the right way to catch up with a much delayed technical modernization programme, which will bring them closer to Western standards and operational capabilities, at the same time allowing for gradual phasing out of legacy, obsolete equipment designed and very often also procured in the Cold War era.

According to the Czech Ministry of Defence (MoD), as of January 1st, 2019 the country's armed forces' kept in its inventory the following number of main combat platforms: 116 main battle tanks (MBTs; all versions of T-72), 437 armoured combat vehicles (including all combat versions of infantry fighting vehicles BMP-1, BMP-2, BPzV, Pandur II 8x8 CZ and armoured personnel carriers of Pandur II 8x8, OT-90 and OT-64 types), 179 artillery systems of the 100mm caliber and above (including all versions of howitzers SPGH M77 Dana, mortars SPM 85 and M1982), 36 combat aircraft (all versions of SAAB 39 Gripen and L-159 ALCA) and 17 combat helicopters (all versions of Mi-24 and Mi-35).

In addition, the Czech Armed Forces also keep in its inventory the following number of military equipment: L-39 training aircraft (5), L-410, Jak-40, CL-601 Challenger,





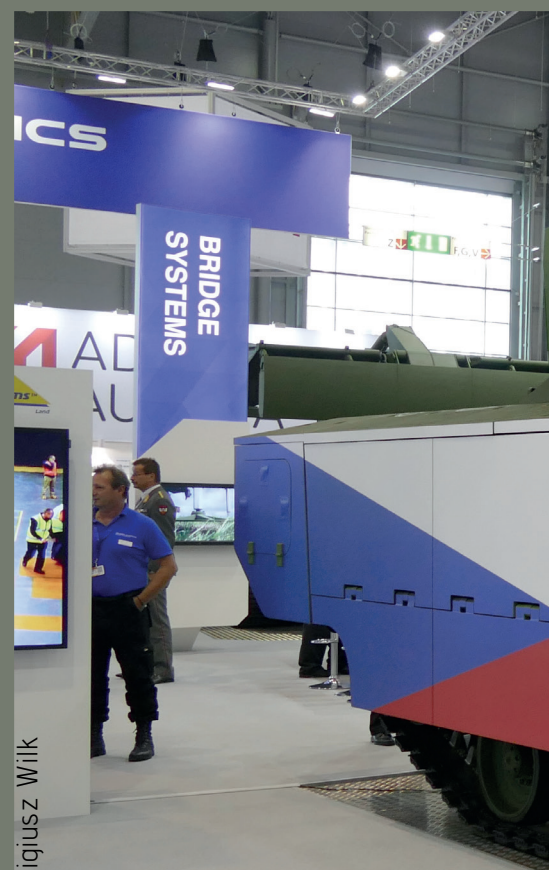
A-319 CJ, and CASA C-295M transport and observation aircraft (16), Mi-8, Mi-17, Mi-171Sh, and W-3A Sokol unarmed transport helicopters (34), various types of vehicles based on IFVs and armoured personnel carriers (149), BRDM-2, Dingo 2 and IVECO light armoured vehicles (171), armoured medical vehicles (39) and MT-55A armoured vehicle-launched bridges (6).

### SIGNIFICANT INCREASE IN DEFENCE SPENDING REQUIRED

However, due to a changing nature of today's battlefield, which requires to operate modern, highly capable and modular weapon systems of

all kinds, the Czech Armed Forces are in need of a deep technical modernization, which will significantly improve its operational capabilities and enhance country's security and safety, especially at a time of high political tension in the Central and Eastern Europe (CEE) region and deterioration of the European and transatlantic security systems in result of the crisis in the Eastern Ukraine.

Back in 2018 the Czech (MoD) outlined a number of strategic modernization programmes, which were to change the posture of the country's armed forces. Among the most urgent issues, where the acquisition or significant upgrade of: 210 tracked infantry fighting





vehicles (IFVs), 62 TITUS armoured personnel carriers, wheeled armoured vehicles, 20,000 pistols and 14,000 attack rifles, eight mobile air defence radars, attack/multi-purpose helicopters, self-propelled artillery and mortar systems, CBRN vehicles, short range air-and-missile defence systems, bridge launching vehicles, as well as a number of unnamed aerial vehicles and modernization of country's T-72M4CZ MBTs.

Over the past several years the Czech government seemed to neglect the need for constant investment in country's defensive capabilities, and continuously cut the defence related spending, which in 2014 reached its lowest level of 0,91% of the GDP. Even in 2016, two years after the crisis in Crimea emerged and war in the Eastern Ukraine erupted, irreversibly changing the security system in Europe, Prague

spent merely 1,01% of its GDP on defence.

Luckily, this detrimental policy has been lately abandoned and authorities in Prague made a long awaited decision to gradually increase investments in Czech's security, speeding up the technical modernization of the armed forces as well as boosting recruitment and enhancing training of the troops. In result, the share of defence related expenditure has risen from 1,04% GDP in 2017 to 1,19% GDP in 2019. Furthermore, the country has set a goal increase this rate to 1,4% of GDP by 2020 and 2% by 2024/2025.

'The main part of (NATO's) work is done in the member states, in building their defense capabilities so that we are able to defend a member of our alliance should he be attacked', said the Prime Minister of the Czech Republic, Andrej Babiš at a conference

1. The event was dominated by no doubt the largest and most important acquisition programme in the latest Czech's history, the planned procurement of 210 tracked infantry fighting vehicles, which will replace the currently operated, legacy BMP-1/BMP-2 platforms

2. GDELS offers the Czech Army its renowned and tested ASCOD 2 vehicle, that has already been selected by a number of countries, such as Austria, Great Britain and Spain. The manufacturer assures that the future offer will feature the ASCOD tracked platform coupled with a selected turret system. The vehicle presented by GDELS during the IDET 2019 exhibition in Brno, was integrated with the unmanned UT30MK2 turret from Israeli Elbit Systems. However, GDELS' representatives assured MILMAG that the platform could very well fit any manned or unmanned turret available on the market, if the Czech Army had such requirement





marking the country's 20th anniversary of joining the alliance, as reported by Reuters in March 2019. 'That is why our republic has pledged to reach the level of 2% of GDP in defense spending by 2024. Defense spending has been growing each year since 2015 and it will continue to grow',

he added.

## NEW IFVS AS A TOP PRIORITY

Czech MoD's technical modernization plans have driven attention of a number of local and foreign manufacturers, which intend to offer its products and services in order to help enhance Czech Armed Force's operational capabilities and the country's safety. Therefore, during this year edition of the International Trade Fair of Defence and Security Technologies (IDET), which was held in Brno at the end of May, a large group of companies presented their answers to the particular requirements of the Czech Army and Air Force.

The event was dominated by no doubt the largest and most important acquisition programme in the latest Czech's history, the planned procurement of 210 tracked infantry

fighting vehicles, which will replace the currently operated, legacy BMP-1/BMP-2 platforms.

Although the Czech MoD intended to launch the formal procurement of new IFVs for many years, it was not before the late 2017 when the programme picked up the right pace, when the department and the whole government hoped for a quick finalization of the selection process, which would allow for the imminent launch of contract negotiations with the preferred bidder and result in contract signing in early 2018. However, these plans were spoiled by the outcome of the general elections, which took place in Autumn 2017, that resulted in the change of the government.

When the new head of the MoD ordered a wide review of all major procurement programmes launched by his predecessor, modernization efforts lost their pace, which resulted in holding

PSM presented in Brno an upgraded version of its IFV offer, designated the Puma S1. The platform was said to set new standards for mobility, protection and firepower. The vehicle offers a wide range of essential features, which might prove to be essential to provide tactical dominance on the battlefield, such as: optimum protection against any type of threat for maximum survivability of the crew, optimum armament for escalation and de-escalation in all missions, rapid, strategic, global deployability and high tactical mobility, network centric warfare capability as well as sustainability under extreme climatic conditions and inadequate infrastructural conditions







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Rheinmetall Landysteme showcased at IDET 2019 its Lynx KF41 IFV, which it intends to offer Prague as a replacement of the currently operated BMP-2 vehicles. According to the company, the vehicle presented in Brno featured latest technical enhancements designed and developed by Rheinmetall and is said to be ready to face various challenges of the current and future battlefield. Among its core capabilities are: adaptability, mobility, survivability and firepower

of the planned procurement of new IFVs.

However, after months of stagnation the MoD eventually achieved a long awaited progress, when at the beginning of August 2019 the department announced sending of the request for proposals (RFP) to four manufacturers, which intended to take part in the tender. These included BAE Systems Hägglunds offering the CV90 tracked platform, General Dynamics European Land Systems (GDELS) with the ASCOD,

Rheinmetall proposing its Lynx as well as Projekt System Management (PSM), joint-venture of Rheinmetall and Krauss-Maffei Wegmann (KMW), offering the Puma vehicle.

The invited manufacturers will have to present their offered platforms to the MoD, proving that they meet all of the requirements of the Czech Army. Furthermore, the companies will have to guarantee that they will keep up with the delivery schedule as well as the estimated budget. Additionally, bidders are also expected to present their plan for providing the buyer with training and technical services as well as provision of spare and repair parts throughout the platform's whole life-cycle. The plan for partnering with the local industry in the manufacture, delivery and maintenance processes is also required.

The preliminary offers should be submitted to the MoD by early October 2019. Subsequently, they will be evaluated, and selection of candidates for further negotiations will be conducted. In the outcome

of this process, manufacturers are expected to improve their offers, especially in regards to the price and performance of the tracked platforms. Then final offers will be filled in, from which the preferred bidder will be chosen.

## TOUGH COMPETITION FOR NEW CZECH IFVS

GDELS, one of major armoured vehicle manufacturers in Europe, intends to offer the Czech Army its renowned and tested ASCOD 2 vehicle, that has already been selected by a number of countries, such as Austria, Great Britain and Spain, which procured it in regards to their own modernization programmes, like Ulan, Ajax and Pizarro.

The manufacturer assures that its future offer in the IFV tender will feature the ASCOD tracked platform coupled with a selected turret system. The vehicle, which was presented by GDELS during the IDET 2019 exhibition in Brno, was integrated with the unmanned





UT30MK2 turret from Israeli Elbit Systems. However, GDELS' representatives assured MILMAG that the platform could very well fit the manned MT30 system, if the Czech Army had such requirement.

GDELS' representatives underlined the fact that integration of the ASCOD platform with Elbit's turret was a result of fruitful and long lasting cooperation of two manufactures and did not relate to any specific requirements set by the Czech MoD, as such weren't publicly announced at that time. However, they assured MILMAG that the company is able to integrate its tracked platform with literally every manned and

unmanned turret system, that is currently available on the market, and the final decision on selection of the preferred system is in the hands of Czech authorities.

During an interview with MILMAG, GDELS' representatives made a strong point about additional virtues of their offer for the Czech Republic, aside from the platform itself. GDELS intends to partner with a number of local defence companies, which would get involved in the manufacture, delivery and maintenance of the future Czech IFVs, assuming that the country's MoD selects ASCOD as the preferred platform.

BAE Systems Hägglunds, the fourth contender taking part in the Czech tender, offers its renowned and battle proven CV90 IFV. However, during the IDET 2019 exhibition the manufacturer presented two specialized variants of the CV90 platform, including the vehicle mounted, self-propelled mortar Mjölner, comprising of a turret system with two smoothbore 120mm gun barrels. It has already been revealed that the new Swedish 120mm SPMs are near delivery, as the first CV90 Mjölner vehicles should be handed over to the Swedish Army this summer



high strategic and tactical mobility, maximum protection and maximum firepower in one single high-performance weapon system. The vehicle is said to be capable to react adequately and with high flexibility to any current and future threats, being ready to provide required support at any time, location and level of warfare intensity.

The Puma IFV is said to offer a wide range of essential features, which might prove to be crucial to provide tactical dominance on the battlefield, such as: optimum protection against any type of threat for maximum survivability of the crew, optimum armament for escalation and de-escalation in all missions, rapid, strategic, global deployability and high tactical mobility, network centric warfare capability as well as sustainability under extreme climatic conditions and inadequate infrastructural conditions.

The manufacturer also assures that the vehicle is ready to operate in various tactical and combat scenarios, offering high level of combat and operational efficiency regardless of geographical and weather conditions. Modularity of the Puma IFV allows for its continuous enhancement and upgrade, making it ready to face different threats on the constantly evolving battlefield.

PSM confirmed that it has designed and developed a wide range of upgrade/modernization packages, for the Puma IFV, which allows the customer to quickly modify and adapt the vehicle in pair with its requirements and according to the current tactical situation.

### RHEINMETALL MAKES A DIFFERENCE WITH ITS LYNX KF41 IFV

Rheinmetall Landsysteme, another

manufacturer involved in the Czech procurement programme, showcased at IDET 2019 its Lynx KF41 IFV platform, which it intends to offer Prague as a replacement of the currently operated BMP-2 vehicles. According to the company, Lynx KF41 is the ultimate future-proof platform, blending high level of protection with massive firepower and unbeatable mobility in a modular concept.

The vehicle showcased in Brno featured latest technical enhancements designed and developed by Rheinmetall and is said to be ready to face various challenges of the current and future battlefield. Among its core capabilities are: adaptability, mobility, survivability and fire power.

According to Rheinmetall, the Lynx KF41 family of vehicles utilise a common drive module and are provided with a flexible mission kit arrangement, which allows the base vehicle to be easily configured according to customer's current requirements, which includes such variants as: IFV, armoured personnel carrier, command vehicle, recovery vehicle or an ambulance. The manufacturer assures that changing from one configuration to another can be done within eight hours.

Rheinmetall underlines the fact that Lynx KF41 features the latest generation of propulsion technology with an 850 kW Liebherr engine and Renk transmission. Lynx can be configured to carry various mission kits and survivability packages without compromising mobility. When configured for mounted combat operations, fitted with the Lance 2.0 turret and a survivability package suitable for peer-on-peer combat, the vehicle has the mass of approximately 44 tonnes.

The manufacturer assures that

a wide range of survivability systems, which were fitted on the Lynx vehicle, provide it with an unprecedented flexibility to cope with a variety of threats. The ballistic and mine protection packages can be easily exchanged, even in the battlefield conditions. Furthermore, Lynx KF41 can be coupled with passive and reactive systems as well as an active protection system to defeat rocket-propelled grenades and antitank guided missiles.

The Lance 2.0 turret system has various enhancements that provide Lynx KF41 with effective firepower and a high level of operational capability. The system features enhanced protection against kinetic and fragmentation threats,







improving vehicle's survivability during close combat.

### BAE SYSTEMS OFFERS A RENOWNED AND TESTED PLATFORM

BAE Systems Hägglunds, the fourth contender taking part in the Czech tender, offers its renowned and battle proven CV90 IFV. However, the vehicle wasn't presented at the IDET 2019 exhibition and the manufacturer decided to showcase instead two specialized variants of the CV90 platform: the vehicle mounted, self-propelled mortar system Mjölner, comprising of a turret system with two smoothbore 120mm gun barrels, as well as the

Armoured Recovery Vehicle (ARV).

According to the manufacturer, the Mjölner SPM, which made its international debut during the IDET 2019 exhibition, is a step-change solution on the battlefield, which will increase the indirect fire capability to support mechanized battalions. The vehicle allows the user to field a capability well adapted for different vehicle platforms while enhancing the whole fleet's firepower.

Mjölner is highly scalable with the possibility to integrate more advanced automated fire-control systems and the ability to handle a wide range of ammunition. Furthermore, the vehicle maximizes the space available by the

A few months after the IDET 2019 exhibition the Czech Government has made a decision regarding another strategic procurement programme, which relates to the long awaited acquisition of a number of H-1 family of helicopters manufactured by the American Bell company. According to the statement made by Czech authorities, the contract will cover the procurement of four AH-1Z Viper attack and eight UH-1Y Venom utility/multirole helicopters

basket-less design, resulting in optimal ergonomics for the crew. In addition, the storage of the majority of the ammunition in the turret bustle provides rapid and easy access from both the inside





and outside, during loading and firing as well as when resupplying the up to 56 grenades.

## SWEDEN SET TO RECEIVE ITS FIRST MJÖLNER VEHICLES

It has already been revealed that new, CV90-based 120mm SPM systems near delivery to the Swedish Army, as the first CV90 Mjölner vehicles should be handed over in September. The Swedish Army has a requirement for 40 Mjölner vehicles and the delivery contract is worth 575 million Kroner.

According to the manufacturer, four Mjölner mortar systems, which will be known as the GRKPBV90 under the Swedish Army's designation, were already delivered to the Swedish Defence Materiel Administration (FMV) in early 2019. These vehicles

were used in a wide range of tests. They also helped to train FMV's and Swedish Army's personnel.

The contract calls for the final delivery of new SPM systems to take place in 2020. Swedish CV90 Mjölner SPMs are expected to reach the Initial Operational Capability (IOC) status by 2020. CV90 Mjölner SPMs are to provide efficient and effective fire support to Swedish Army's mechanised battalions. These vehicles will replace the currently operated towed 120mm artillery systems.

## CZECH REPUBLIC PROCURES NEW ATTACK AND UTILITY HELICOPTERS

A few months after the IDET 2019 exhibition the Czech Government has made a decision regarding another strategic procurement programme, which relates to the

long awaited acquisition of a number of H-1 family of helicopters manufactured by the American Bell company. According to the statement made by Czech authorities, the contract will cover the procurement of four AH-1Z Viper attack and eight UH-1Y Venom utility/multirole helicopters.

The planned acquisition was announced by the country's Prime Minister, Andrej Babiš, during his visit to the 22nd Helicopter Air Base in Náměšť nad Oslavou, which took place at the end of August. The head of Czech government was accompanied by the minister of defence, Lubomír Metnar.

"I was acquainted in detail with the acquisition of new helicopters. (...) We want to make the purchase as soon as possible. Deliveries should start in 2023," said Prime Minister Babiš.

"We reviewed the offers received,



and based on military recommendations, we decided on a variant that includes eight UH-1Y Venom multi-purpose and four AH-1Z Viper attack helicopters. We would like to conclude the contract by the end of the year,” Minister Metnar added.

The contract with Bell is expected to be worth Czech koruna 14.5 billion. This sum will most likely include the cost of a dozen attack/multirole helicopters, as well as provision of weapon systems and ammunition, plus maintenance and training packages.

The head of the Czech MoD is expected to push for finalization of the government-to-government agreement with the USA once all necessary procedures are finalized. The procurement will most likely be conducted through the Foreign Military Sales (FMS) procedure, which means that U.S. armed forces should get involved in the whole process.

Although the H-1 platform turned out to be the most preferred one, it surely wasn't the only which was considered by the Czech government, as another American manufacturer, Lockheed Martin, also competed in the tender and made a determination to offer Prague a dozen of its UH-60M Black Hawk helicopters. Furthermore, it was previously reported that Lockheed's bid was cheaper than Bell's and valued at Czech koruna 13,2 billion.

The fact that Bell offered modern, multirole attack and utility H-1 platforms, which share 85% part commonality, must have worked in its favour, and helped the manufacturer to secure the contract despite having submitted a more costly offer than the other competitor. Same as the fact that the American company has been present in the Czech Republic

for many years, which allowed it to achieve a strong and solid position in the Czech's aviation industry and on the local market.

## BELL STAYS POSITIVE ABOUT EXPORT OPPORTUNITIES IN THE CEE REGION

It seems obvious, that the U.S. company will now try to push harder on other Central and Eastern European (CEE) markets, like Poland and Romania, where it makes efforts to secure export contracts for delivery of H-1 attack and utility helicopters.

‘Across CEE, we got significant interest from a number of nations. Some of them we obviously cannot name due to the competitive nature of the efforts that we are putting in’, said Joel Best, Director of Global Sales and Strategy at Bell. ‘But I would say that there is great opportunity for Bell and for the H-1 programme with probably 8 or more significant nations of interest’, he added.

The company follows very closely all recent developments in Poland, as the country is expected to re-launch the long awaited Kruk programme, that calls for the

procurement of a series of attack helicopters. “We are very excited to see that there is a little bit life in the Kruk programme again,” Best said. “We are very active. We are involved and trying to push the process forward and obviously excited to work with Polish industry. We had meetings with PGZ [Polska Grupa Zbrojeniowa]

1. The Finnish Patria presented the turreted, remote-controlled NEMO mortar, as part of its offer for the Czech Army, which has a requirement for new 120mm self-propelled artillery systems. The company intends to take part in the future tender. The mortar system presented in Brno was based on the AMV 8x8 chassis. However, the manufacturer assures that there is no problem in integrating it with any vehicle the Czech customer would require

2. The Slovak MoD failed to secure the contract for procurement of 81 Vydra 8x8 wheeled armoured vehicles, which were designed in the result of cooperation between a number of local defence companies and the Finnish Patria. The programme has a value of approx. €417 million. The design was based on the new prototype version of AMVXP vehicle, which served as the platform for the research and development phase, coupled with the locally developed turret system





and other leaders within Poland.”

The American manufacturer also expresses its interest in the planned procurement of new attack and multirole helicopters by Romania. “We are still very involved in Romania. It is a very large programme: 24 AH-1Zs and 21 UH-1Ys,” admitted Best.

‘The Romanian army needs attack helicopters. There’s a pretty

deep discussion about attack helicopters with the United States. (...) It is very possible that by the end of the year we will have a 5 year production agreement with the United States of America’, the Romanian Minister of Economy, Nicușor Bădălașu, announced.

The Romanian MoD has already made a determination to procure a number of attack and multirole/utility helicopters from Bell, as it sent an official Letter of Request to the U.S. Department of Defense regarding the possible acquisition a few years ago. Ever since, the company has tried to reach an agreement with Romanian authorities in relation to the eventuality of creating a partnership for production and maintenance of new rotary-wing platforms that could be procured by the Romanian Armed Forces.

The American manufacturer has already set up a partnership with Industria Aeronautică Română (IAR)

Brașov, the main aerospace manufacturer in Romania, when both companies signed a Memorandum of Understanding in 2016. The document lays ground for further negotiation of cooperation in the case of a potential sale of Bell’s helicopters to Romania.

Although Bell seems to be close to securing the final contract for the sale of a number of attack and multirole helicopters, it surely isn’t the only company on the market that is interested in Romanian procurement plans, as Lockheed Martin, acting through its Sikorsky subsidiary, wants to offer Romania the UH-60M Black Hawk platform, or its internationalized S-70i variant manufactured by the Polish PZL Mielec.

Furthermore, for many years Romania has enjoyed a fruitful cooperation with the European Airbus Helicopters company, which in the past resulted in launching of the local production of such platforms, as IAR 316B Alouette III and IAR 330 Puma. The decision to partner with Bell for the long awaited acquisition of new attack/multirole helicopters might cast a shadow on relation with Airbus, and preclude any further cooperation in the field of rotary-wing platforms, which might also hinder finalization of an agreement signed a few years ago, which called for joint production of the H215M multirole helicopter. IAR was said to become the prime contractor for this platform, if the Romanian MoD decided to procure it in the future.

## PATRIA NEMO FOR CZECH REPUBLIC

During the IDET 2019 exhibition the Finnish Patria presented the turreted,

1. The Slovak Army’s modernization programme also includes the acquisition of 424 multirole tactical 4×4 vehicles, plus an option for the procurement of 20 additional vehicles for the Ministry of Interior. Its budget was set at €321 million. The programme faces delays, as country’s political opposition accuses MoD officials for setting tender requirements in favour of a specific manufacturer, therefore, turning the open, international competition, which has been launched by the ministry in June, into a farce





remote-controlled NEMO mortars, as part of its offer for the Czech Army, which has a requirement for new 120mm self-propelled artillery systems. The company's representative confirmed that it intends to take part in the future tender.

The mortar system presented in Brno was based on the AMV 8x8 chassis. However, according to Risto Paloposki, business development manager at Patria, the manufacturer will not limit its offer to this particular vehicle, as it is aware that the Czech client would rather prefer to integrate the new mortars with one of the platforms its already operated.

Furthermore, it is possible, that Prague will decide to divide the turreted mortars among a number of chassis which are currently in service, which would result in integrating it with the wheeled Pandur II 8x8 armoured vehicle, as well as the future fleet of IFVs. The Finnish company is ready to meet this challenge.

The Czech Army is understood to have a requirement for as much as 62 new self-propelled mortars, which will replace the currently operated self-propelled SPM-85 PRAM-S and towed M1982 PRAM-L artillery systems. According to Paloposki, this is a big enough order to consider moving the production of mortars directly to the customer country, either entirely or just for the final assembly process. However, this would require signing of a separate Transfer of Technology agreement.

Furthermore, transferring of NEMO's production to the Czech Republic would be preceded by negotiations with the local defence industry, which would allow for setting the guidelines for future cooperation and determinate the scope of involvement of the



Czech companies in the whole process as well as the role they might play in finalization of other export contracts that Patria might secure in the future.

Aside from Patria's 120mm NEMO artillery systems, the HSW (Huta Stalowa Wola) company, a member of the Polish Armaments Group holding, is said to also be considered as a potential supplier of new 120mm turreted mortars. The Polish manufacturer could offer its M120 artillery systems, which are already being delivered to the Polish Army, and can be integrated with virtually every wheeled or tracked drive platform.

## SLOVAKIA PROLONGS ITS VEHICLE PROGRAMMES

Although the IDET 2019 exhibition was focused mostly on the Czech Armed Force's procurement programmes, Slovak modernization requirements were also noted during the show. So far the country failed to finalize the acquisition of 81 Vydra 8x8 wheeled armoured vehicles, which were designed in the result of cooperation between a number of local defence companies and the Finnish Patria. The programme has a value of approx. €417 million.

1. The Slovak Army's modernization programme also includes the acquisition of 424 multirole tactical 4x4 vehicles, plus an option for the procurement of 20 additional vehicles for the Ministry of Interior. Its budget was set at €321 million. The programme faces delays, as country's political opposition accuses MoD officials for setting tender requirements in favour of a specific manufacturer, therefore, turning the open, international competition, which has been launched by the ministry in June, into a farce

In the spring of 2017 heads of Slovak and Finnish MoDs agreed on a joint research and development programme for the new wheeled, armoured vehicles for the Armed Forces of Slovakia. The ministries chose three companies as industrial partners: Konstrukta Defense a.s. (main supplier), Patria Land Systems Oy (platform) and EVPU a.s. (weapon system).

In the outcome of the agreement, Patria provided a new prototype version of AMVXP vehicle, which served as the platform for the research and development phase. The programme called for a series of field tests, which were already conducted in Slovakia and Finland in various weather and





During IDET 2019 Nexter, a KNDS company, showcased its know-how and proposed a wide range of solutions that are to meet the needs of Slovak Armed Forces, including the 6x6 TITUS armoured vehicle, which was presented on the CSG stand. Shortly after the show the Czech MoD announced signing of a contract for procurement of 62 TITUS 4x4 wheeled armoured vehicles

geographical conditions.

It was expected that the Slovak MoD will finalize the procurement of 81 Vydra 8x8 vehicles in the first half of 2019. The final decision in this matter was to be taken shortly after conclusion of the testing phase, which allowed for the evaluation of platform's operational capabilities.

However, the programme has been unexpectedly withheld due to harsh criticism it faced from the country's political opposition, which questioned its high budget as well as the decision unilaterally taken by the MoD to select the Patria AMV as the preferred platform for the future wheeled, armoured vehicles of the Slovak Army without launching an

official, open tender. The international competition would allow other manufacturers to submit their own, competitive offers, which could lead to lowering the acquisition price.

Controversies, which arose around the expected procurement of new wheeled, armoured vehicles, encouraged the country's Office for Public Procurement (UVO), which controls the execution of public tenders in Slovakia, and verifies if they are carried out in accordance with the country's law, to monitor the whole process. UVO representatives have already announced that the office is ready to take appropriate actions if it finds any irregularities in the procurement procedure.

The long awaited procurement of new wheeled, armoured vehicles could be delayed even more due to the coming general election, which are to take place early 2020, and could lead to setting up of a new government, hence shifting the balance of power in the Slovak parliament. Especially, if the new head of the MoD, which might take office after the elections, orders

evaluation of all major procurement programmes launched by his predecessor. This might lead to cancelling or re-launching of a number of acquisitions. Therefore, signing of the final contract for the procurement of Vydra 8x8 vehicles seems pointless at the moment.

## TACTICAL VEHICLES DELAYED

The planned acquisition of a number of new armoured 8x8 vehicles is just a part of a larger modernization effort of the Slovak Army, which also sets a goal for acquiring of 424 multirole tactical 4x4 vehicles. The programme includes an option for the procurement of 20 additional vehicles for the Ministry of Interior.

However, the programme, which budget was set at €321 million, also faces delay. Country's political opposition accuses MoD's officials for setting tender requirements in favour of a specific manufacturer, therefore, turning the open, international competition, which was launched by the ministry in June, into a farce.

Eventually, the tender for procurement of a number of multirole tactical 4x4 vehicles for the Slovak Army has been suspended and UVO officials continue to evaluate the legality of the whole competition. The office still assesses documents submitted by the MoD in regards to the planned acquisition. The evaluation conducted by UVO, was launched at the request of the MoD.

A number of local and foreign manufacturers, some of which have a rich experience in designing of multirole tactical 4x4 vehicles, is expected to participate in the Slovak tender and present their offers. However, currently it is hard to predict, when the competition could kick off, as



UVO still continues to evaluate the whole process.

In the most optimistic scenario, the Office won't find any irregularities in the procurement procedure launched by the MoD, and the tender could start with just a few months of delay. On the other hand, UVO might eventually recommend to cancel the programme and re-launch it after further reconfiguring some or all of its requirements, which could lead to even longer delay of the procurement process, leaving the Slovak Army with no other option than to continue use of currently operated, legacy wheeled platforms.

## JLTV SHOWCASED IN BRNO

Oshkosh Defense showcased the Joint Light Tactical Vehicle (JLTV) for the first time at IDET 2019. The manufacturer stated that JLTV 4x4 is the next generation light tactical wheeled vehicle with a combination of protection, mobility, transportability and Net Ready systems integration that delivers the network capability of a mobile command center.

'Combat operations require military units to be mobile, fast, lethal, protected and connected and the JLTV is a perfect fit for today's mission requirements, as well as the needs of the future', said Mike Ivy, senior vice president of international programs and global product support for Oshkosh Defense.

'In addition to a highly adaptable weapons platform, the JLTV is a network on wheels, representing the first time a tactical wheeled vehicle was designed from the ground up to be Net Ready for communications in denied environments', he added.

According to Oshkosh the benefits of JLTV to the international community include fleet commonality among coalition forces as well as a

vehicle that has already undergone rigorous U.S. Army and Marine Corps testing, making the JLTV primed for a variety of mission requirements. The JLTV reliability was assessed at more than double the specification requirement after 100,000 miles of U.S. Government Reliability Qualification Testing. Several countries have publicly expressed interest in procuring the JLTV, including Lithuania, Slovenia, and the United Kingdom.

The fact that the JTLV platform was presented in Brno was most likely related to the requirement of the Slovak Army for a number of such 4x4 tactical vehicles. It is very probable, that the Wisconsin-based manufacturer will try to take part in the future competition. Especially that Slovakia, as a NATO member state and a close ally of the U.S., could consider it reasonable to procure the same tactical, wheeled vehicles, like the ones which are currently being deployed among US Army and USMC units.

## NEXTER PRESENTS ITS OFFER FOR THE CZECH REPUBLIC AND THE WIDER CEE REGION


During IDET 2019 Nexter, a KNDS company, showcased its know-how and proposed a wide range of solutions that could meet the needs of Slovak Armed Forces. The French manufacturer presented at its stand a copy of the 8x8 VBCI armoured vehicle, equipped with a 40mm turret (T40) and a model of the Armored Combat and Reconnaissance Vehicle EBRC-JAGUAR. Nexter's 6x6 TITUS armoured vehicle was also visible on the Czechoslovak Group (CSG) stand, equipped with a 20mm ARX 20 turret. On the artillery side, Nexter showcased a model of CAESAR 8x8. This version of the 155mm

self-propelled artillery gun, which can fire 6 rounds per minute with very high precision, was ordered by the Danish army.

The company also exhibited its know-how in turrets. In addition to the T40 mounted on the VBCI and the 20mm ARX 20 turret on TITUS, the group presented the RAPIDFire turret in its land version and the P20 light-duty manual mount, both on 1/5 scale. Air systems were not left out with the presence of models of the POD NC621 gun and the SH20 retractable door mounting for helicopters.

Visitors also discovered the NERVA robot and its payloads, the FINDEAGLE mission enhancement kit, the FINDMP digital system and the FINDART fire support command and control system. Finally, Nexter showcased a wide range of ammunition, ranging from 20mm to 155mm, including the KATANA smart ammunition.

Shortly after the IDET 2019 the Czech MoD announced that it signed a contract for procurement of 62 TITUS 4x4 wheeled armoured vehicles. The value of the order is 6 billion Czech koruna. Deliveries will take place between 2022-23.

The Czech MoD for sure has a long way ahead to achieve all of its modernization goals, which will enhance the operational capabilities of the country's Armed Forces, bringing them closer to NATO standards. If the ministry wants to reach this milestone, it has to speed up or at least maintain the current pace of a number of its procurement programmes and make an effort to secure the required level of funding from the government. 



 MICHAŁ JAROŃSKI



# PARIS

# AIR SHOW 2019







✉ MICHAŁ JAROŃSKI  
RAFAŁ MUCZYŃSKI  
📷 MICHAŁ JAROŃSKI



The 53rd edition of Paris Air Show 2019 took place from 17th to 23rd June at le Bourget airport just outside Paris. During a weeklong show 2453 manufacturers from 49 countries, including 1185 local companies, showcased its products. Among the countries, which were represented by the biggest number of exhibitors, were USA, Germany, Italy, Great Britain and Belgium.



The event was attended by over 316 000 visitors, including 140 000 professionals from nearly 190 countries. 2700 journalists from 87 countries accredited for the show. Approximately 140 vertical-lift and fixed-wing platforms were on the display at le Bourget. The agreements signed during the Paris Air Show were valued at \$140 billion.





The French manufacturer Dassault Aviation and European Airbus Defence and Space presented at le Bourget a full scale model of the 6th generation multirole fighter jet SCAF/FCAS (Système de Combat Aérien du Futur/Future Combat Air System) and a number of auxiliary, combat unmanned aerial vehicles RC (Remote Carrier). The aircraft is developed as part of an offer for governments of France, Germany and Spain for the replacement of currently operated Rafale, Typhoon and C.15 Hornet fighters. The French president, Emmanuel Macron, was the guest of honor and was accompanied by the ministers of defence of all three countries: Florence Parly, Ursula von der Leyen and Margarita Robles, who signed a cooperation agreement.

The SCAF/FCAS project should conclude in 2021 and serve as a starting point for





development of a new generation fighter aircraft NGF (New Generation Fighter). The programme will be commenced by Dassault, while Airbus will develop a fleet of auxiliary UAVs and an ACC (Air Combat Cloud), which will analyse all data gathered by the aircraft in real time, help the pilot in the decision making process and secure the platform from cyber threats. A number of other European manufacturers will be involved in the NGF programme, such as Safran or MTU Aero Engines, which will deliver NGF's new engines. MBDA will be responsible for the development of platform's combat systems and Thales will deliver avionics. NGF is expected to make a maiden flight by 2026. It should be ready to enter service in 2040'.

The FCAS programme has an estimated value of at least €4 billion. France is expected to contribute €2,5 billion and Germany €1,5 billion. At this moment it's not sure, what financial contribution will be made by Spain, which has joined the project just lately, after months of negotiations.





MBDA presented at Paris Air Show technology demonstrators of new air-to-air and air-to-ground weapon systems, which could be applied for the SCAF/FCAS or Tempest next generation multirole fighter aircraft. Among systems on display were four missiles designed to operate in the Anti-access/Area-denial (A2/AD) environment.

The idea behind the development of these missiles was based on five requirements: deep strike capability, tactical-level engagement, medium- and long-range aerial warfare, soft- and hard-kill self-defence capabilities and capability to penetrate enemy airspace with the use of UAV platforms.

The MBDA's presentation included weapon systems, which are something in between cruise missiles and UAVs. Remote Carrier 100 and Remote Carrier 200 have masses of, subsequently, 120 and 240 kg. They will be able to carry different types of warheads, including explosive, targeting, reconnaissance or EW. Remote



Carrier 100/200 weapon systems will be carried and launched by the fleet of next generation fighter jets, and subsequently operate in swarms.

Another family of weapons presented at le Bourget were the two types of cruise missiles, each equipped with different propulsion systems. The low altitude Subsonic Cruise Missile is designed as the successor of the currently operated Storm Shadow/SCALP EG (SPEAR Capability 4) missile and will be used to attack ground or sea based targets deep behind enemy lines.

The Supersonic Cruise Missile was designed based on the experience from the CVS401 Perseus project. It could replace the ASMP-A (Air-Sol Moyenne Portée-Amélioré) missile, armed with a 300 kt nuclear warhead, in the French Armed Force's inventory. Both cruise missile systems are predicted to replace RGM-84 Harpoon and MM38/MM40/AM39/SM39 Exocet missiles for France and Great Britain.

MBDA showcased also SmartGlider and SmartCruiser missiles. Both will be offered in the Light (120 kg) and Heavy (1300 kg) variant. A special HSL (Hexabomb Smart Launcher) launch system will allow for carrying 12-18 missiles in the Light version. The manufacturer is also working on a miniaturized, hard-kill missile system to enhance self-defence capabilities of the user's aircraft platform. They will be less than 1 m long and weight under 10 kg. Other systems on MBDA stand included: AIM-132 ASRAAM, CAMM, Brimstone and SPEAR missiles.







**TF**  
**TURKISH FIGHTER**

**GENERAL CHARACTERISTICS**

Wingspan:	14 m
Length:	21 m
Height:	6 m
Thrust:	2 x 27,000 lb
Service Ceiling:	55,000 ft
Maximum Speed:	1.8 Mach
G Limits:	+9.0 g / -3.5 g

**DESIGN CHARACTERISTICS**

- Low Observability
- Internal Weapons Bays
- Designed for Growth
- Increased Situational Awareness
- Supercruise
- Sensor Fusion

**OPERATIONAL CAPABILITIES**

- Multi-Role & Swing-Role
- Air Superiority
- Beyond Visual Range (BVR)
- Within Visual Range (WVR)
- One Aircraft - Any Mission
- Unmatched Capability
- Fleet Effectiveness
- Continuous Enhancements

**AVIONICS & SENSORS**

- IRFS (AESA Radar, EW)
- Advanced Navigation Features (CN)
- IEDS (IRST, EOTS, etc.)
- Advanced Cockpit / HMI

For the first time ever the full scale mockup of the Turkish TF-X 5th generation multirole fighter jet was shown at the Paris Air Show 2019. The platform is being developed to meet the future requirements of the Turkish Air Force.

TF-X is developed by TAI and other local companies in response to the Turkish Air Force requirement for a new generation multirole platform, which eventually will replace the currently operated F-16 jets. However, it still remains unclear, what role





will the TF-X play in regards to F-35A Lightning II jets, which Turkey was supposed to procure until the late political disrupt with the U.S. over the procurement by Ankara of the Russian S-400 air-and-missile defence systems.

According to the manufacturer, the TF-X will have a length of 21 m, wingspan of 14 m and height of 6 m. The aircraft should reach the max speed of 1,8 Mach and have a service ceiling of 55, 000 ft.

Platform's design will be characterized by stealth, internal weapons bay, increased situational awareness, supercruise and sensor fusion. The first flight of TF-X's prototype is planned for 2025. The platform should be commissioned in 2020'.





The Boeing KC-46A Pegasus, which is set to become the backbone of the US Air Force's (USAF) future tanker-transport aircraft fleet was shown for the very first time at the Paris Air Show held at the le Bourget airport. It was presented along with a number of other Boeing platforms, including the P-8A Poseidon, F-15E Strike Eagle, AH-64 Apache attack helicopter and CH-47 Chinook heavy-lift helicopter. The aircraft presented at the Paris Air Show was one of nearly a dozen of operational





KC-46A Pegasus tankers in the US Air Force inventory. Deliveries started as early as 25th January and to date the USAF has accepted 11 KC-46s, with 6 planes delivered to the McConnell Air Force Base in Kansas and another 5 to Altus AFB in Oklahoma.

The Initial Operational Testing and Evaluation of the platform was launched on 4th June at the McConnell AFB. According to the USAF, it will 'provide an assessment of how well the aircraft performs under the strain of operations'.

Boeing is currently on contract for delivery of 52 KC-46A with the total USAF's requirement believed to be 179 aircraft at this moment. As much as 36 tankers are to be delivered by the end of 2019.





During Paris Air Show Leonardo presented its newest and largest-ever drone, the FalcoXplorer. Presentation of Leonardo's remotely-piloted air system opens new civil and military markets for the Italian company.

According to Leonardo, the newly presented Falco Xplorer features a payload capacity of 350kg, more than 24 hours flight time and a satellite communications capability for beyond-radio-line-of-sight operations, all within a 1.3 ton maximum take-off weight. Each element of the system, from unmanned platform to the sensor suite, mission system and ground control station, was developed by the company in-house.

'Leonardo invests continuously in new capabilities to ensure we position the





right products in the right markets', said Leonardo CEO Alessandro Profumo during the presentation. 'The Falco Xplorer is designed to be extremely competitive in its category, building on the experience we've gained working with Falco family customers over a number

of years and our Company's strengths in the unmanned domain. By understanding and being able to meet our customers' needs, we expect to increase our share of the unmanned systems market', he added.

Currently the Falco Xplorer is undergoing certification for flight in non-segregated airspace, allowing the platform to be sold on military and civilian markets. Aside from militaries, such institutions as coast guards and emergency responders, are mentioned as potential customers.

The manufacturer expects that Falco Xplorer will be ready for deliveries to first customers as early as 2020. It will be certified according to STANAG 4671, allowing it to be sold among NATO countries.





UVision Air unveiled at the Paris Air Show a Multi-Canister Launcher (MCL) for the Hero-400EC loitering munition system. According to the manufacturer, the MCL is suitable for a wide range of land and naval applications.

'Hero-400EC is a long-range, high-precision loitering munition system with a low acoustic, visual and thermal signature that can locate, track and strike static and moving targets with high accuracy, stealth and minimal collateral damage. Precision strike capabilities, extended endurance of up to 2 hours, and multipurpose warhead – including concrete piercing, anti-tank, and anti-personnel that handle different types of targets with exceptional accuracy – enable long-range & versatile missions. Due to its exceptional manoeuvrability, Hero-400EC provides an advanced mid-air abort capability that allows automatic re-entry into loitering mode, re-engagement, or return to the recovery area using a parachute'.

Hero-400EC is a long-range and endurance weapon system, which weights 650 kg. It can be launched from a modular multi-tube canister mounted on various land or naval platforms and deployed in Forward Operating Bases.





It was unveiled in le Bourget that Rafael Advanced Defense Systems concluded tests and demonstrations of a new ATR (Automatic Target Recognition) capability for its SPICE-250 air-to-surface munition, which adds to an array of technologies applied for this weapon system, such as Automatic Target Acquisition (ATA) and Moving-Target-Detection homing modes.

ATR enables the SPICE-250 weapon system to learn the characteristics of the target before the strike, thanks to the use of advanced AI and deep-learning technologies. The pilot makes the selection of targets which are supposed to be hit, and allocates them to particular missiles. Rafael states that subsequently 'the weapons are launched towards the vicinity of the targets, using their INS for initial navigation. When approaching the target area, the weapons use the ATR mode for detection and recognition of the targets. Each weapon homes-in on the pre-defined target, either autonomously or with a human-in-the-loop, aided by the ATR algorithm'.

The family of SPICE (250, 1000, 2000) standoff, autonomous, air-to-ground missiles are designed to attack targets with pinpoint accuracy and at high attack volumes. The system can operate in GPS-denied environments. The particular SPICE-250 missile has a standoff range of 100 km, and can be equipped with either general purpose or penetration 75kg class warhead.

SPICE-250 WITH AI





Leonardo and Diamond Aircraft showcased at le Bourget the new DA62 MSA (Maritime Surveillance Aircraft) aircraft for the first time. It was designed to meet the requirements of clients, who look for an affordable Intelligence, Surveillance and Reconnaissance platform, capable of conducting short and medium range maritime and over-land surveillance missions. Among potential operators are countries in South America, Africa and Asia Pacific.

The aircraft is equipped with Leonardo's Gabbiano Ultra-Light TS Radar, operating in various modes, a High Definition third-party Electro-Optic (EO/IR) system and Leonardo's ATOS mission system, all fully integrated into the operator's touchscreen ATOS display. As an option, the client can also require





Leonardo's SAGE ESM system and Spider communications intelligence system.

'Diamond Aircraft is very proud to step into such an important strategic partnership with Leonardo to provide a cost-efficient, high-performance maritime surveillance

solution to the market. We all recognized the importance of such a capability and the high demand of many countries to protect their borders against illegal fishing and other criminal operations. This new airborne solution, based on our DA62 Special Mission Aircraft, will be available to the market by the end of the year, ready to deliver and provide security and surveillance tasks', said Liquun Zhang, CEO of Diamond Aircraft.

'Partnership is central to Leonardo's way of doing business and as such we are delighted to be working with Diamond Aircraft on this venture. Our aim is always to provide the optimum solution to our customers and we believe that this combination of Diamond's platform with a full suite of Leonardo sensors and our mission system provides an extremely compelling offer for this market segment', said Fabrizio Boggiani, Senior Vice President Airborne Sensors & Mission Systems, Leonardo Electronics.





Eurofighter, Eurojet Turbo and the NATO Eurofighter & Tornado Management Agency (NETMA) have agreed on cooperation and support for the long-term development of the Eurofighter Typhoon combat aircraft.

The study contracts are worth EUR54 million. They will look at the Long Term Evolution of the aircraft and the EJ200 engine. Agreements will span a total of 19 months for the aircraft and 9 months for the engine elements.

According to Eurofighter, the LTE will identify 'a suite of technology





enhancements for the weapons system infrastructure and the engine that will ensure the aircraft remains operationally effective and can continue to spearhead the partner nations' air forces

for the decades to come'.

'These contracts represent a significant step in shaping the future of Eurofighter and will ensure it continues to be one of the most important assets in the future operating environment', said Herman Claesen, CEO of Eurofighter.

Under the LTE contracts a number of technology areas will be explored, such as: mission system architecture, the Praetorian Defensive Aids Sub-System, the human-machine interface, operational flexibility as well as engine performance.





SHOT SHOW





MARCIN GAŁĄZKA  
JOACHIM RAŻNY  
CELINA PAWLIK  
MARCIN WRZEŚNIEWSKI

The SHOT Show, inaugurated in 1979, is the biggest annual firearms tradeshow in the world. It is also ranked as the 25th largest trade-show in the United States, which lets you imagine its huge scale. The event is organized by the National Shooting Sports Foundation (NSSF), established in 1961 and brings together over twelve thousand firearms manufacturers, distributors, dealers, owners of shooting ranges, sports clubs and various media.

The SHOT (Shooting, Hunting and Outdoor Trade) Show takes place annually, in the last week of January or the week before. The event used to be held in different locations each year, but in 2010 it was permanently relocated to the Sands Expo and Convention Center in Las Vegas. Despite enormous capacity of the venue, it is not big enough to fit all exhibitors interested in participation. Many of them have to wait on the reserve list and they can actively partake in the event only after some other business resigns.

The 41st edition attracted 58 thousand representatives of the industry from 111 countries, while 2.4 thousand companies held an exhibition during the event, which are record-breaking numbers. The New Product Center alone, a space designed specifically for the purpose of exhibiting products that are new on the market, featured booths of over 400 companies. The combined area of all exhibitions was 64.3 thousand square meters and the event (which took place between January 22nd and 25th) brought the city of Las Vegas an income of 90 million dollars.



## A DROP IN SALES

The NSSF estimates that the firearms business in the United States engages 312 thousand people, almost half of which work directly in manufacturing, while 63 thousand are subcontractors. Yearly wages combined equal 15.7 billion dollars, and the economic impact of the sector is estimated at 52 billion, which brings the state 654 million in taxes.

Gun sales numbers are assessed by the NSSF based on the number of the NICS (National Instant Criminal Background Check System) procedures revealed by the FBI. In 2016 gun sales were record-high,

reaching 15.7 millions of individual weapons sold. However, this number dropped to 14 million in 2017, and in consecutive year it declined even further by 6.1 per cent, stopping at 13.1 million. The last two years have brought the gun sales a combined drop of 16.5 per cent.

It is worth noting that from 1945 until 2001 yearly numbers of individual gun sales fluctuated between 3 and 6 million; the September 11 attacks spurred the massive increase of the number of handguns, carbines (especially the AR and AK clones), rifles and shotguns sold each year. The sales were also affected by multiple

declarations coming from the Democrats and concerning possible gun ownership restrictions. It is only now that the market started to stabilize, as the drop in sales is probably related to the election of Donald Trump as president of the United States. During his campaign, Trump voiced his support of the Second Amendment, which appeased the conservatives advocating for free gun ownership. The current administration does not intend to introduce any new restrictions, although, following 2017 Las Vegas shooting, they decided to ban bump-stock guns which imitate the firing motion of fully automatic weapons.

# MAGPUL REFRESHES MP5

Magpul Industries' SHOT Show presentation included SL line polymer handguards and lower receivers with pistol grips with upgraded ergonomics and thumb safety for Heckler & Koch MP5 submachine guns. Inside of the grip, there are small compartments that can accommodate batteries or cleaning sets. Safety leaves were located on both sides. The grips come in two sizes: standard and large. The fore-ends designs vary, so that they can fit both full-scale MP5 models and shorter MP5Ks. In the first case, there are three Magpul M-LOK mounting holes at the bottom and on each side of the weapon; MP5K variety has only one such mounting hole on each side.





# SUREFIRE XR1/XR2 AND XVL2



Surefire's flashlights XR1 and XR2 also made their debut during the SHOT Show. They are more powerful varieties of XC1/XC2 flashlights, suited for mounting on everyday carry weapons. As opposed to their antecedents, the devices are powered from a built-in battery. XR1 and XR2 were equipped with dual-head LEDs with MaxVision Beam reflectors, delivering luminous flux of 600 lm out to 80 meters. The internal power supply can be replenished with a magnetic charger – just like some of the Olight flashlight models. XR2 was additionally equipped with a laser. The devices have anodized aluminum bodies and weigh 63 g. They are mounted with two parallel screws which lock the rail mount onto the accessory rail. The dimensions of the devices deviate from XC1/XC2 very slightly.

Surefire have also presented a multifunctional device XVL2 which combines the functions of a flashli-

ght, a laser illuminator and a target designator – both in infrared and visual spectrum. The project was in development for a couple of years and had been commissioned by the special forces. Its prototypes were exhibited during the last couple editions of the show. XVL2 is two times larger than standard pistol-mounted flashlights. The device's switches remained identical as in X300 series flashlights; on the left side of the case there is an additional switch enabling to select the preferred function. The flashlight generates a luminous flux of 400 lm, while the red illuminator's power is 300 mW. There are two models of XVL2 – the less powerful is marketed for the civilians, and the more powerful is aimed at

the uniformed services. The power limitations concern the infrared modules. XVL2 is supplied by a single CR123 battery that can be changed after disassembling the head of the flashlight/illuminator. The device's operation time is estimated at 1.5 hours.





# BRN-180: AR-180 REMODELED

During the SHOT Show, Brownells presented the BRN-180 rifle, a hybrid of 5.56mm ArmaLite AR-180 and AR-15. The weapon features AR-180's mechanism and upper receiver and AR-15's lower receiver. Gas piston operation of AR-180 remains unchanged. The original stamped steel upper receiver was substituted with an aluminum one. It was also shortened, along with the bolt carrier and the return mechanism. Such change was necessary in order to retain the length compatible with AR-15's lower receiver. Because of AR-180's return mechanism design, the stock of BRN-180 folds to the left. The weapon is equipped with a free-floating barrel and an aluminum octagonal handguard. Top of



the handguard is covered in a long Picatinny rail extended by another piece on the upper receiver. All other sides of the rail are outfitted with Magpul M-LOK standard mounting

holes. According to the manufacturer's information, the weapon is already in production and is going to be distributed in the United States. American market price is 799 USD.

## UNITY TACTICAL



Unity Tactical premiered two products: Hot Button tactical tape switch and atypical FAST mounts for red dot sights and magnifiers. Hot Button is fitted to work with flashlights and laser target designators and is mounted using M-LOK standard mounting holes. The activation button was positioned at 45-degree angle, which provides for better ergonomics and enables accessing it with support hand's thumb. FAST mounting base is a bit taller than the standard one because of the mechanism enabling the magnifier to move vertically from the line of sight. This solution is supposed to prevent the device from getting stuck on any elements of the environment and to facilitate using the weapon while wearing a gasmask. The base of the red dot sight was equipped with an iron sight which eliminated the necessity of mounting another device on the accessory rail. The base is fit for any device with Aimpoint Micro T-1 hole spacing standard.





# GEISSELE AUTOMATICS SUPER DUTY



Geissele Automatics' first semi-automatic carbine also debuted during the SHOT Show. There are two types of rifles: Super Duty and Super Duty LE (Law Enforcement). The first one is marketed as aimed for civilians, while the second – exclusively for law enforcement. Super Duty comes in black or flat dark earth color

and is equipped with well-known Geissele Automatics accessories: a handguard with M-LOK mounting holes, a trigger guard, an SSA Lightning Bow trigger mechanism and fixed or folding iron sights. Super Duty LE carbines are black and their handguard does not feature the accessory rail; Picatinny rails can be mounted on the

M-LOK mounting holes instead. The front-end is distinguishable by characteristic blue lines, which are supposed to underline the weapons' purpose. Super Duty LE also features ALG trigger group. The price of the civilian model is estimated at 1700 USD, while the slightly worse-equipped police model will cost 750 USD.

## KEL-TEC KS7 SHOTGUN

New products from Kel-Tec presented at the SHOT Show include KS7 bullpup shotgun – a modification of KSG model. KS7 shotgun has an almost identical build; it features, however, not two but only one magazine with the capacity of seven 12 GA. The manufacturer is planning to introduce three-round magazine extensions and hence longer barrels. Apart from smaller width, Kel-Tec KS7 is also distinguishable by its carrying handle attached to the rail and equipped with a fiber optic sight. It can be dismounted and substituted with



any other type of sights – iron or optic. The frontal part of the handle and the rear part of the fore-end

are equipped with Magpul M-LOK mounting holes, which allows mounting of additional accessories.



# NOT YOUR TYPICAL KREBS CUSTOM AK



Krebs Custom AK-9 is a prototype of 9 mm x 39 carbine, presented at the booth of Wolf Performance Ammunition. This type of rounds is used by Russian special models VSS Vintorez and AS Val. The weapon is equipped with a Magpul MOE grip

and a Tailhook PSB stabilizing brace (in accordance to the local law limiting access to short-barreled firearms). For their AK-9, Krebs Custom designed a 30-round aluminum magazine. The weapon's handguard is also made of aluminum and features two Picatin-

ny rails: the longer top one and the shorter bottom one. The weapon has an OD finish and the barrel was equipped with a device suitable for mounting of suppressor – this does not surprise as the 9 mm x 39 is subsonic by principle.

## REJUVENATED STEYR A2 MF



Another SHOT Show debut was Steyr Arms A2 MF (Modular Frame) semi-automatic 9 mm x 19 pistol. It is a modified variety of M9-A1 and L9-A1. A2 MF pistol, similarly to many new designs, was equipped with a serialized frame with a trigger mechanism paired with a polymer grip-frame. The inlet of the magazine well was additionally profiled in order to facilitate the insertion of a new magazine. A2 MF has an enhanced grip texture and exchangeable inserts on sides and back, which enables for a better fitment of the weapon to the shooter's hand. Steyr is planning to introduce new grips, barrels and slides that can help customize the pistol according to the shooter's needs. The pistol's price is 675 USD.



# PWS MK1 PRO CARBINES



MK1 PRO is a family of carbines introduced by Primary Weapons System (PWS). The weapons' design is based on AR-15 and they are considerably less expensive than other models offered so far. M116 and (stockless) M111 rifles feature a two-part long-stroke piston mechanism and a three-set-

ting adjustable gas system which enables the use of a muzzle when heavily fouled, and paired with sound suppressors. The receivers have a different design and are made of a cheaper aluminum alloy 6061-T6. MK1 PRO does not have any ambidextrous manipulators, except for the Radian Raptor charging handle.

Each carbine, except for the pistol versions, comes with an inexpensive A2 birdcage type flash-hider, Bravo Company USA grips and stocks and Lancer magazines. The fore-ends were equipped with Magpul M-LOK mounting holes. The prices are 995 USD for the whole firearms and 650 USD for the receiver only.

## BOLT-ACTION DD DELTA 5

During the Las Vegas exhibition, Daniel Defense introduced the first repeating precision rifle, Delta 5. The receiver and the barrel were installed in a carbon fiber chassis with adjustable length of pull. The height of the cheek support can also be altered. Delta 5 features a bolt action mechanism with four locking lugs spaced at 60 degrees. The charging handle is threaded and can be substituted with a different one, according to the shooter's preferences. The rifle uses AICS standard magazines and features a cold hammer forged barrel mounted by a nut, which allows for quick changes of the caliber. Timney Elite Hunter single-stage trigger can be adjusted from 0.7 to 1.8 kg. On



top of the receiver, a Picatinny rail with a 20 MOA/5.8 MRAD cant was installed. Five Magpul M-LOK standard mounting holes are located on the frontal part of the handgu-

ard: two on each side and one at the bottom. Delta 5 uses following types of ammunition: .308 Winchester, 6,5 mm Creedmoor and 7mm- 08 Remington.



# STEINER DRS 1X PREMIERE



During SHOT Show, Steiner company introduced the DRS 1X (Defendu Reflex Sight) red dot sight. It is dedicated for the military and uniformed services for intuitive close combat. DRS 1X is an optical sight with three different C2 dots: 2 MOA dot, a dot with two auxiliary lines and a similar cross-shaped mark with an additional 13,64 MOA dot below. The device uses two AA batteries, it can, however, operate with only one. Steiner state that their product can operate for at least 2000

hours with two batteries. After 13 consecutive hours of continued operation, the sight turns itself off automatically. The brightness of the grid can be adjusted with four daylight settings and three night settings. The case is made from magnesium alloy and the control buttons were located on top of it. The water resistant battery slots were placed in the frontal part of the device. In the bottom part of the device, there is a Picatinny rail mount. USA retail price is estimated at 749 USD.

# HUDSON MANUFACTURING ABSENT

Hudson Manufacturing company, which produced 9-mm semi-automatic H9 pistols, did not show up in Las Vegas, despite their earlier announcements of forthcoming premieres of their products. The company declared bankruptcy linked to

the marketing mistake – the far too-early announcement of the alloy-frame model. This step caused a massive drop in sales of the original all-steel H9 pistol in anticipation for the lighter, more concealed-carry friendly variant. The loss of income

caused Hudson to be unable to further produce the H9 and fulfill the warranty claims. As of now the KE Arms Company (one of the former parts suppliers) is in possession of a large number of spare parts and can provide the service for the damaged H9s.

# RETURN OF THE COLT KING COBRA



At the Show Colt's Manufacturing announced that .357 Magnum King Cobra revolver will return to the market. The weapon underwent slight changes: a new trigger guard shape was introduced, along with a rubber-coated Hogue grip. King Cobra revolver is chiefly made of stainless steel and its cylinder accommodates six rounds. Its sights consist of a groove on top of the frame and a front sight with a brass insert. The revolver features a SA/DA trigger mechanism.



# POF-USA NEW PRODUCTS



Patriot Ordnance Factory USA showed two new carbines that already hit the market in 2019. They are called Wonder (using .233 Remington/5.56x45mm ammunition) and Renegade+ (using .224 Valkyrie/5.6x41mm ammunition). The latter is equipped with a 20 in/508 mm barrel

and has particularly high accuracy with 75 gr/4.86 g and 88 gr/5.7 g cartridges. It weighs 3.46kg and costs 2029 USD.

The Wonder model comes with an aesthetically interesting finish, which the manufacturer calls Blue Titanium. It was equipped with an ambidextrous Strike Eagle charging

handle, rubber ERGO grip and a Micro B single port muzzle brake. In the lower receiver there is a single-stage mechanism with a flat trigger with 1.6 kg pull. The weapon's weight is 2.8 kg, while the MSRP (Manufacturer suggested retail price) is supposed to be 1599 USD.

## ZEV TECHNOLOGIES OZ9



Zev Technologies introduced their OZ9 9 mm x 19 pistol – it is the first firearm designed entirely by this company. The characteristic

feature of the weapon is its two-part frame, consisting of an insert comprised of an accessory rail, slide rails, locking block and

trigger mechanism, and a polymer grip with exchangeable panels. OZ9's slide is fit for mounting of MRDS and it was equipped with a set of fiber optic iron sights. Front and back of the slide was outfitted with wide grooves for easier charging and press-checks. Slide porting, located on the frontal part of the slide – on top and on each side – decrease its weight. OZ9 is supplied with Glock 17's 17-round magazines. ZEV Technologies' new firearm is also compatible with the Austrian company's slides and barrels. The pistol comes with a PRO Plus magwell and two PMAG 17 GL9 magazines in a polymer SKB case.





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