

## Fair of weaponry and military equipment “PARTNER 2007”

Miroslav Jandrić, BSc (Eng)<sup>1)</sup>

THE third Fair of Weaponry and Military Equipment, “PARTNER 2007”, held from 26 to 29 June, 2007, was organized by “Jugoimport-SDPR” and Belgrade Fair under the patronage of the Ministry of Defence of the Republic of Serbia. The goal of the manifestation was to present defence industry capacities of the Republic of Serbia to national and international audience.

Over 60 exhibitors from the country and abroad presented their products. Development projects of the Military Technical Institute (VTI) and “Jugoimport SDPR” dominated. A number of leading Serbian defence companies participated in the Fair, the most prominent among them being: “ZASTAVA ORUZJE” – Kragujevac, “KRUSIK” – Valjevo, “PRVI PARTIZAN” – Uzice, “SLOBODA” – Cacak, “MILAN BLAGOJEVIC” – Lucani, “PRVA ISKRA” – Baric, “TRAYAL” – Krusevac, “MILE DRAGIC” – Zrenjanin, etc. Foreign exhibitors were represented by “Thales” from France and “Rohde & Schwarz” from Austria. Apart from weapon and military equipment manufacturers, several overhaul companies, e.g.: “TRZ” – Cacak, “TRZ” – Kragujevac, and “MOMA STANOJLOVIC” – Batajnica, presented their capabilities at the Fair.

At Belgrade Fair visitors could see modern small arms, fire support artillery and missile systems, self-propelled and towed artillery systems, anti-armor combat systems, combat and non-combat vehicles, ammunition of various calibers and purpose, artillery and mortar fuze systems, telecommunication equipment, personal protective equipment, prototypes of an unmanned aerial vehicle and a pilot primary training aircraft, etc.

When small arms were concerned, the visitors` attention focused on the CZ-999 pistol, the M-97 submachine gun, (Fig.1) the M-21 assault rifle and the large caliber sniper rifle CRNA STRELA (Black Arrow).



Figure 1. 9mm PARA submachine gun M-97 and M-97K

The submachine gun is of 9mm caliber “PARA” with an effective range of 150m. Depending on whether it is equipped with a 20 or 30-round clip, without or with a stock, it weighs 2.85kg or 3.3kg, respectively. It can be optionally fitted with a folding stock, a laser target marker and a silencer. The operating principle is free bolt recoil. It is suitable for close combat in populated areas and counter-terrorist actions in hostage situations. It is primarily intended for equipping special force and reconnaissance units and for personal protection of combat vehicle crews.



Figure 2. 5.56mm assault rifle M-21

The M-21 assault rifle (Fig.2), of 5,56x45mm caliber, reached a limit of 20,000 rounds fired during reliability testing, owing to its polygonally rifled barrel. The gas-operated rifle is designated on the basis of the Kalashnikov automatic system, which makes it highly efficient and resilient under all extreme climate and combat conditions. The folding stock, grip, frame and magazine are made of contemporary composite materials. The main subsystems fitted into this rifle are: M-21 optoelectronic sight with 3 x magnification and the field of vision of 14°, laser target designator, and 40mm underbarrel grenade launcher with the rate of fire of 12 rpm. Five different types of rounds are developed for this underbarrel grenade launcher.

Apart from its basic 12.7x107mm caliber, the CRNA STRELA (Black Arrow) rifle can be manufactured in .50 Browning caliber on demand. With the effective range of 1800m and with the use of penetrating, incendiary and armor-piercing rounds, it is efficiently used for neutralizing light-armored and non-armored vehicles, grounded aircraft and helicopters, radar and communication systems, ammunition and fuel depots, individual targets, etc. The double-chambered reactive muzzle brake and two spring buffers inside the stock reduce recoil. The basic design of the *Mauser* bolt is preserved.

After the world premiere at the IDEX-2007 Fair in Abu Dhabi, this Fair saw the following systems being for the first time presented in the region: 155mm artillery projectile V-LAP with a range of 65km, 262mm missile with a new rocket engine enabling a range of 65km, command intelligence system for artillery and combat vehicles already tested during the M-84 tank upgrade, and a new ALAS (Advanced Light Attack System) missile system (Fig.3).

<sup>1)</sup> Military Technical Institute (VTI), Ratka Resanovića 1, 11132 Belgrade, SERBIA



**Figure 3.** ALAS missile system

The ALAS missile system is based on a 25km-range guided missile, with turbojet propulsion which enables the maximum mid-course speed of 180m/s. The advantage of this missile system is that its cruising altitude is between 150m and 500m, thus making it considerably protected from enemy radars, while its relatively low IR signature, due to the turbojet engine, makes it hard to detect by TV or thermal imaging systems. The mid-placed engine is powered by air intake through air inlets mounted symmetrically to the longitudinal missile axis. The engine is of a conventional type with an axial compressor, a combustion chamber and a single-stage axial flow turbine.

The multipurpose ALAS missile system is intended for a wide spectrum of actions against enemy targets such as tanks, armored fighting vehicles, fortifications, command posts, low-flying helicopters, coastal ships, industrial facilities, bridges, etc. Its tandem shaped charge warhead penetrates 800mm of RHA with pre-positioned ERA plates.

The missile can be programmed to fly along a pre-set trajectory with defined coordinates of check points, with the possibility of activating the homing head for potential target detection. The ALAS system is thus transformed into a reconnaissance system ready for rapid target destruction. A TV or IR homing head provides remarkable precision and efficiency.



**Figure 4.** MALJUTKA-2T with tandem warhead

As far as anti-armor combat was concerned, visitors' attention was drawn to the BUMBAR (Bumble Bee) anti-

armor guided missile system and the MALJUTKA system (Fig.4) with a range of 3000m, a new shaped charge warhead capable of penetrating 800mm of RHA and an average flight velocity of 110m/s.

The BUMBAR system (Fig.5) is equipped with a 136mm round that weighs 12kg. The missile is thrust vector controlled and armed with a tandem shaped charge warhead with penetration of over 1000mm. The effective range of this anti-armored missile system, which can operate from indoors, is from 60m to 600m. Further development of the BUMBAR aims for an effective range of up to 1000m.



**Figure 5.** Anti-armor guided missile system BUMBAR

A family of 60mm light mortars, with barrels 1200mm and 1500mm long, a range of 5.2km or 5.5km and a weight of 25.5kg or 27kg, respectively, was presented for the first time at the Fair as well as a family of revolver grenade launchers and their 38mm ammunition, based on non-lethal ammunition, and 40mm ammunition, based on NATO standard ammunition for underbarrel grenade launchers of low muzzle velocity.

One of the best export projects of the Serbian military industry, the modernized self-propelled artillery system NORA-B52 (Fig.6), dominated the open exhibit space of Belgrade Fair. This 155mm self-propelled turretless gun-howitzer is intended for general direct and indirect fire support. It has high fire power and respectable range, high rate of fire, good maneuverability, on- and off- road mobility and capability of high and low angle fire without a change in firing position.



**Figure 6.** Self-propelled artillery system NORA-B52

The NORA-B52 K possesses a high degree of automation of all weapon functions – from deploying in the

firing position, through calculating firing elements to automatic loading of projectiles and propelling charges. The range of 42km is achieved with an original solution of base bleed projectiles. A base bleed projectile V-LAP (Velocity Enhanced Long Range Artillery Projectile), which should enable this artillery system to attain an effective range of 65km to, is in the final stage of development.

A high-efficiency muzzle brake and the breechblock with a horizontal sliding wedge bolt are installed on the 155mm/52 caliber barrel. The chamber automatic sealing system is installed as a part of the barrel and the bolt, so the weapon uses caseless ammunition. The muzzle velocity is 925m/s, and the firing rate is 6rpm. The base ammunition package includes 36 rounds and 42 propelling charges. Optional equipment includes a 7.62mm or 12.7mm machine gun for close combat.

The weapon is mounted on the 8x8 cross-country wheeled chassis. The drive is on all 4 crankshafts, with two front steering shafts. A Diesel engine provides a high level of cross-country mobility and good maneuverability. The total weight of this self-propelled artillery system is around 30,000kg.

A multipurpose engineering vehicle MUNJA (Fig.7) is based on the T-55 tank. According to available data, no one in the world has ever realized such an AFV configuration. Comfortable space for the 8-member crew (commander, driver, gunner and 5 pioneers) is provided in the interior. The crew is provided with everything necessary for survival at the battle ground. All ergonomic requirements are fulfilled.

The MUNJA is equipped with a dozer blade as well as with all the necessary engineering kits stowed inside and on the vehicle necessary for performing various engineering tasks such as crossing artificial and natural obstacles, blocking, road repairing, demining, etc. Equipment includes a computer system with integrated general positioning system software, digital compass, laser rangefinder and digital camera. Smoke grenade launchers (6+6), which cover the 120-degree area in front of the vehicle, serve for vehicle and crew protection.



**Figure 7.** Multipurpose engineering vehicle MUNJA

Besides being primarily an engineering vehicle, this armor tracked vehicle is extremely suitable for equipping peacekeeping force units during special operations. The armament including a 30mm automatic grenade launcher and a 7.62mm machine gun, has proved to be an ideal combination in counter-terrorist actions for neutralizing point targets while engineers perform tasks such as mining, demining, demolition, etc. It can be equipped, on demand, with a remote mining system PLJUSAK (Shower).

In a group of non-combat vehicles, visitors' attention

was drawn to the FAP 1118 4x4 (Fig.8) transport vehicle, the military model of which is in the final stage of testing. The vehicle is powered by a turbo-diesel engine of 4250ccm volume capacity and it develops 130 kW at 2200 r.p.m. The weight of the vehicle itself is 6400kg, and its payload is 5000kg. This 4x4 off-road vehicle successfully crosses 60% gradients and side slopes of 35% owing to its low center of gravity with no risk of overturning. The fording depth is 80cm. With the operational range of 700km, FAP 1118 is designed to operate efficiently in the temperature range from -30°C to +50°C.



**Figure 8.** FAP 1118 truck

Special attention of the visitors was drawn to a new model of LASTA (Fig.9), light piston-propeller training aircraft, primarily intended for initial and basic training of military pilots. With in-line tandem seating, the trainer was developed in accordance with the FAR (JAR) 23 regulations for acrobatic category of airplanes and it provides an easy transition to jet aircraft at higher training levels.



**Figure 9.** LASTA trainer

The LASTA is equipped with a six-cylinder 224kW (300 HP) engine of the opposed-cylinder type, and a double metal propeller, which provide maximum flight velocity (at an altitude of 3000m and a takeoff weight of 1085kg) of 300km/h. The empty weight is 850kg, and the maximum takeoff weight is 1150kg. The total aircraft length is 7.97m. The trapezoidal wings have a wingspan of 9.7m and a surface of 12.9m<sup>2</sup>. The altitude barrier of flight is 6000m.

A model of a mini unmanned aerial vehicle (Fig.10) intended for day/night reconnaissance using a CCD camera, which represents a part of C41 command intelligence system, was also presented at the Fair. Its flight is controlled from a mobile ground station. The aircraft's length is 1.97m and the wingspan is 2.7m. The maximum weight is 20kg and the payload is 5kg. The 3.4kW engine provides an altitude barrier of 1500m at a speed of 118km/h. The flight autonomy is 2.5 hours.

Serbian military industry offered at the Fair a wide selection of personal protective equipment for soldiers, which enhances survivability in combat actions. The M-97 helmet provides a high level of ballistic protection ( $V_{50}=600\text{m/s}$ ). When compared to the most significant world competitors, the testing showed that it provides 5% better protection, with 100g less weight (1460g). Several models of bulletproof vests, which became an integral part of every soldier's equipment in modern wars, were displayed.



**Figure 10.** Unmanned aerial vehicle

Combat clothes and footwear were presented (Fig.11). They are maximally functional in providing necessary comfort, microclimate, protection from extreme temperatures, and, with their camouflage qualities, protection within the visible and IR part of the spectrum. The M-03 demining boots are a part of protective equipment used inside mine fields, and efficient against infantry mines (up to 75g of TNT).

The visitors' attention at the Fair was also drawn to individual and collective equipment for NBC protection of body and respiratory organs, water and air purifiers, camouflage equipment, etc. Protective masks, protective suits, hoods, gloves, socks, goggles, filters, respirators, chemical detectors, and various detection and decontamination agents were displayed.



**Figure 11.** MD-06 demining suit

The PARTNER 2007 Fair was a good opportunity to demonstrate results and successes in conquering new technologies by the Serbian military industry. This manifestation does not have a commercial character for the time being as major world fairs of this type do. This manifestation is constantly upgraded, aiming at regional significance in the future with a considerable commercial effect. The next PARTNER Fair will be held in 2009.

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## **Sajam naoružanja i vojne opreme "PARTNER 2007"**



## **Ярмарка вооружения и военного оборудования "Соучастник 2007"**



## **L'exposition de l'armement et de l'équipement militaire PARTENAIRE 2007**