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POLISH DEFENCE INDUSTRY

■ ONE VEHICLE
MANY POSSIBILITIES
PAGE NO 22

■ THE POLISH
INDUSTRY
CONSTRUCTS
SPY
AIRCRAFTS
PAGE NO 30



KTO Rosomak
combat vehicle

2-5.09.2013
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MSPO 2013

**21th International Defence
Industry Exhibition**

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Polska
DEFENCE INDUSTRY



**INNOVATIVE
ECONOMY**
NATIONAL COHESION STRATEGY



**EUROPEAN UNION
EUROPEAN REGIONAL
DEVELOPMENT FUND**

Project co-financed by the European Union,
Sub-measure 6.5.1 of the Innovative Economy Oretion Programme.



LADIES AND GENTLEMEN

Every company, especially operating in the armaments sector, is trying to cope with the dynamic changes and challenges brought by today's times by constant development.

One of the areas that the defense equipment manufacturers are currently focused on are new technologies allowing not only to cut costs, but also increase productivity. In a wider perspective, Polish producers create innovative solutions through research and new technologies – they introduce new products, services or even business collaboration models.

The wide range of possibilities offered by Polish manufacturers and the highest quality of their products provides customers with a full range of solutions and services tailored to the current and future needs of the dynamically growing army.

In this edition of our Polish Chamber of National Defence Magazine, we wish to share examples of first-class solutions, characterized by excellent quality and durability.

I wish you an enjoyable read,

Slawomir Kulakowski

President of the Polish
Chamber of National
Defence Manufacturers

POLISH CHAMBER OF NATIONAL DEFENCE MANUFACTURERS

On the 11th September of 1995 a constituent meeting was held, at which, a resolution to establish the chamber, initiated by the representatives of the Polish defense industry, has been adopted. A temporary management and an auditing committee has been elected by the representatives of the 67 founders, in the presence of General Henryk Mika from the Ministry of Defense and Colonel Slawomir Kulakowski from the National Security Bureau.

During the past 10 years, the Chamber has been initiating activities to advance the technical level and product quality for the national defense, promoted the cooperative relations, inspired projects which led to an increase in the production for the domestic and foreign markets, as well as has inspired and supported the restructuring and modernization of the Polish industry while preparing its integration with the European structures.

During that period, the organization of trainings for the representatives of the Polish industry and the facilitation of foreign contacts has been a significant element of the Chamber's activity. Besides the above, it has organized experience exchange within the areas of technical, organizational and trade solutions.

Since 1998, the Chamber has been a co-organizer of the BALT MILITARY EXPO exhibition in Gdansk, and has co-organized the „Cło i Granica” (Border and Customs) Fair in Warsaw since 2004. In 2000, the Chamber has initiated and coordinated the Polish Defense Industry Days in Lithuania, during which, the associated companies have handed over equipment worth approximately 4 million PLN, including the Chamber's contribution of 700.000 PLN, to the Lithuanian part of the LITPOLBAT battalion. In 1998, the Chamber has been assigned to represent the Polish defense industry at the NATO Industrial Advisory Group (NIAG), and since December of 2000 it has actively taken part in the meetings of the Group.

Currently, the Chamber associates 147 public and private enterprises. These include market leaders such as BUMAR Sp. z o.o., the Polskie Zakłady Lotnicze Sp. z o.o. (Polish Aviation Works), the Stalowa Wola S.A., MESKO S.A. and RADWAR as well as small businesses and private companies.

POLAND

Poland is situated in the central part of the European continent. It covers an area of 312 683 square kilometres, placing Poland as 9th in Europe and 63rd the world. Poland is situated between the Baltic Sea to the north and the Sudeten and Carpathian Mountains in the south, in the Vistula and Oder basin.

■ BORDERS

Poland's shape resembles a circle with a distinctive knob – the Hel Peninsula (34 km long with an average width of 500 m). Poland is bordered by Germany (467 km) to the west, by the Czech Republic (790 km) and Slovakia (541 km) to the south and Ukraine (529 km), Belarus (416 km), Lithuania (103 km) and Russia (210 km) to the east. Furthermore, Poland's northern boundary is in the most part set by the coast of the Baltic Sea. The Polish exclusive economic zone in the Baltic Sea is bordered by Denmark's and Sweden's economic zones. The total length of Poland's land and sea borders is 3496 km.

■ ARMED FORCES

The Polish Armed Forces are divided into: the Army, the Air Force, the Special Forces and the Navy. Their main task is the defence of the Polish borders against outside attacks and cooperation with NATO. The armed forces are an essential element of the national defense system, designed for the effective implementation of the security and defense policy. The Polish armed forces number nearly 100 000 troops. They have taken and are taking part in a number of foreign missions of the UN, NATO and the EU.

■ CONSTITUTION

The Constitution of the Republic of Poland is the most important Polish legal act and the foundation of the Polish state. It guarantees the rights and freedoms of citizens, determines the relationships between the legislative, executive and judicial branches, decides on the form and way of appointing key national institutions such as the Parliament, the Senate, the President and the Council of Ministers. The Constitution has a direct influence on the form of the judicial system, local governments and state control bodies.

■ ECONOMY

In terms of GDP, at the end of 2011 Poland was the 6th economy in the European Union and the 20th in the world. Poland's economic system can be described as a mixed economy. The state sector now generates about 25 percent of the GDP. This is a level comparable to countries such as France and Norway. Foreign investments in the period between 1990 and 2006 amounted to over 87 billion dollars.

□ SOCIETY

According to data from 2011, the territory of the Republic of Poland is inhabited by 38.5 million people. In terms of population Poland occupies the 29th place in the world and the 8th in Europe. The Polish population represents 5.3% of the European population and 0.65% of the population of the world.

■ LEGISLATURE

In Poland the legislature is a bicameral parliament consisting of the lower house – the Sejm and the upper house – the Senat. In direct, universal and secret elections, Polish citizens elect 460 members of the Parliament and 100 senators. Both MPs and senators are elected for a four-year term.

■ FOREIGN POLICY

The Republic of Poland is a rapidly developing country, a member of many international organizations. Poland is a member of the European Union, NATO, the UN, the World Trade Organization, the Organization for Economic Co-operation and Development, the European Economic Area, the International Energy Agency, the Council of Europe, the Organization for Security and Co-operation in Europe, the International Atomic Energy Agency, the European Space Agency and the G6. Poland is the co-founder of organizations such as the Central European Free Trade Agreement (left in 2004), the Council of the Baltic Sea States, the Visegrad Group and the Weimar Triangle. It is also a signatory of the Schengen Agreement and is considering joining the euro area.

POLISH HISTORY

Poland is situated in the central part of the European continent. It covers an area of 312 683 square kilometres, placing Poland as 9th in Europe and 63rd the world.

Poland is situated between the Baltic Sea to the north and the Sudeten and Carpathian Mountains in the south, in the Vistula and Oder basin.

■ THE BATTLE OF GRUNWALD

The Battle of Grunwald is one of the greatest battles in the history of medieval Europe. It was fought on the 15th of July, 1410. The battle was a part of the great war between the forces of the Teutonic Knights, assisted by West European knights, under the command of the Grand Master Ulrich von Jungingen, and the combined Polish and Lithuanian forces, under the command of the Polish king Wladyslaw II Jagiello. The battle ended with the victory of the Polish-Lithuanian army and a crushing defeat of the Teutonic forces. The outcome of this battle had a major impact on political relations in Europe of that time. Not only did it break the power of the Teutonic Order, but also elevated Poland and the Jagiellonian dynasty to the rank of the most important ones in the continent.

■ THE BATTLE OF VIENNA

The battle was fought at Vienna on the 12th of September, 1683 between joint Polish, Austrian and German forces under the command of king John III Sobieski, and the army of the Ottoman Empire under the leadership of Vizier Kara Mustafa. The Turkish army numbered close to 140 thousand people. It was the largest army that was mobilized in the seventeenth century. Austria has managed to gather 32 thousand soldiers. Jan III Sobieski called up about 27 thousand Crown troops, including 25 hussar regiments, and marched to the relief of Vienna.



The battle ended with the defeat of the Ottomans. This battle is considered to be one of twenty groundbreaking battles in the history of the world.

■ THE ROAD TO INDEPENDENCE

The Treaty of Versailles that ended World War I sanctioned Polish independence – before that Poland disappeared from the map of the world for 123 years as a result of partitions. The official date of the foundation of the Second Republic of Poland is the 11th of November, 1918, when Jozef Pilsudski took over the military authority in Warsaw. As a result of his actions the German troops withdrew from the city, and the Polish state institutions that were being formed conferred to him the title of the Chief of State.

■ INDEPENDENT SELF-GOVERNING TRADE UNION "SOLIDARITY"

"Solidarity" was a national trade union formed in 1980 to defend the rights of workers. Until 1989 it was also one of the main centers of mass resistance against the rule of the Polish People's Republic. One of the leaders of the workers' strikes that led to changes in the whole Europe was Lech Walesa, who later became a Nobel Peace Prize laureate. He was elected President in a two-round general election held in November and December of 1990.

■ THE POLISH POPE

John Paul II was the first Polish pope, as well as the first non-Italian Bishop of Rome in 455 years. The election of a person from a communist country for the head of the church had a significant influence on the events in Eastern Europe and Asia in the 80s of the 20th century.

WSK PZL-RZESZÓW MODERNIZES THE ENGINES OF M-28 BRYZA AIRCRAFTS

Based on the agreement with the Inspectorate of Armaments, WSK PZL-Rzeszów plants will renovate and modernize TWD-10/PZL-10 family of engines that propel M-28 Bryza aircrafts. TWD-10/PZL-10 engines are used in M-28 Bryza aircrafts. This basic, light transport and patrol aircraft is used by the Polish Air Force and Navy.

C-295M TRANSPORT AIRCRAFTS FINISHED THEIR STAY IN AFGHANISTAN

Polish Air Force report that the operations of Aviation Group in Afghanistan. The group used C-295M light transport aircrafts. C-295M served for 2.5 years. Each team consisted of fourteen men and an aircraft - in total, 90 soldiers served during the mission. Each rotation lasted from five to eight weeks, during which time the aircrafts were used by the Polish Military Contingent and its allies - 2085 flights (including flights from Poland) giving 2,729 hours in the air. Currently, soldiers from the 8th Airlift Base maintain airlift between Poland and Afghanistan.

BUMAR GROUP IS WORKING ON A NEW APC

In response to the current and future needs of the Ministry of National Defense in securing the supply or armored personnel carrier for the Polish Army, Bumar Group started developing a new Polish APC. The first stage of research and development work in the form of a feasibility study will be funded from Bumar's own resources for innovation. The project work will utilize the experience of Wojskowe Zakłady Mechaniczne (Pol. Military Mechanical Works) in Siemianowice Śląskie and the experiences gained from the use of this type of combat vehicles in Afghanistan. The project of developing a new Polish armored personnel carrier will involve Polish defence industry companies. Further research and development work will be financed by the Ministry of National Defense or the National Research and Development Centre.

LIFEGUARD SPEC QR VEST HONORED WITH THE DEFENDER AWARD

During this year's International Defence Industry Exhibition in Kielce, LUBAWA SA won the prestigious DEFENDER award. LIFEGUARD SPEC QR bulletproof vest was designed for uniformed armed formations. Because of its functionality, it is a lightweight bulletproof vest with an integrated platform for carrying tactical equipment. The vest has a two-point quick take-off system for emergency situations (such as fire, falling into the water, the need for medical assistance, etc.). It is equipped with so-called conveyor system for evacuation of the wounded. The system allows the injured user to be quickly evacuated. With this this system, the evacuated person is carried on the back of the evacuating person. It is worth noting that the weight of the vest in the base bundle, largest protected area and while maintaining the required protective performance and functionality weighs only 4.80 kg (size L).

BUMAR ELECTRONIKA WILL SUPPLY SPARE PARTS FOR AIR DEFENSE SYSTEMS

The Armament Inspectorate announced the signing of an agreement with Bumar Elektronika for the supply of spare parts for the air defense systems operated by the Polish Army. As part of the signed contract worth 1.7 million PLN, Bumar Elektronika will provide two sets of IRIS-AWS-C infrared cameras and two sets of ŁK-24AR5 switchboard-terminals with PO-240R-7 desktops. The devices are to be installed on Blenda fire control Blenda, NUR-22 (3D) radiolocation station and Łowcza command car.

PRESENTATION OF MSBS - 5.56 MM

Arms Factory presented the results of research and development work on the MSBS-5.56 modular firearms system. The presented basic Modular Firearms Arms System (MSBS) rifle is a prototype rifle made as part of the MSBS project funded by the company. The project was initiated in November of 2011 and will end on December of 2013. It is a research-development-implementation project and it will result in the production of the basic rifle along with the knife-bayonet and 40mm attached grenade launcher.

MASKPOL WILL PROTECT POLISH SOLDIERS

MASKPOL - a protective equipment manufacturing company - incorporated in the Bumar Żołnierz product division received an order to deliver 28.4 thousand Mp-6 Apollo gas masks and 25.5 thousand sets of FOO-1 protective filter clothing. The total value of the order amounts to 78 million PLN. All ordered sets of MP-6 Apollo gas masks and FOO-1 clothing will be delivered to the Polish army by 2015. The new MP-6 Apollo gas masks will be produced using modern equipment purchased through a grant awarded last year by the Ministry of Economy.

MODERNIZATION OF "SPIKE" LAUNCHER

Bumar Amunicja signed an agreement with the Inspectorate of Armaments to modernize the Spike anti-tank missile launchers and additional equipment, which are used by the Polish Army. Under the agreement, the work will be performed on 26 Spike launchers, 5 stationary training devices, 8 field training devices and 8 Spike mock-ups. Negotiations on the work started in the second half of 2011. One subject was Bumar Amunicja S.A., whose subsidiary - Zakłady Metalowe MESKO - produce the launchers under the license for the Polish Army. Spike anti-tank guided missiles constitute a new quality in the arsenal of the Polish Army, according to plans, Poland will purchase more than 2,000 missiles of this type, and they will be the main weapon for combating armored targets by infantry units.

RADMOR AS THE MOST INNOVATIVE COMPANY

Radmor company - part of the WB Group - has been recognized by the „Rzeczpospolita” daily newspaper as the most innovative company in Poland. The ranking in which RADMOR took first place is made based on the questionnaires sent by the editors to Polish companies. Financial data, information on the ownership structure, export and employment are used to prepare the statement of 2000 top companies. The table presents the best companies rated in different categories: the most profitable, largest exporters, reaching the highest profit, most investors, increasing employment, etc.

MUNITIONS FOR THE POLISH ARMY FROM BUMAR AMUNICJA

Bumar Amunicja signed a multi-year agreement to provide munitions for the Polish Army. The contract was signed on November 5th and assumes delivery of more than 191 thousand pieces of four types of munitions in 2012-2015. These include: UZA universal artillery starters (40 thousand, 10 thousand every year), MRW-U fuse (14 thousand, 3500 pieces annually), 9 mm blind pistol bullets (100 thousand, 50 thousand in 2012 and 2013) and 30 mm TP-T training projectiles (37,790 units).



OSA (SA-8) COMBAT VEHICLE AFTER MODERNIZATION

One of the recent projects completed by Wojskowe Zakłady Uzbrojenia S.A. from Grudziądz (WZU S.A.) is the upgraded equipment of the PRWB 9A33BM OSA (SA-8) anti-aircraft combat vehicle. The modernization will result in increased resistance to passive and active interference.

The scope of the developed and implemented modernization translates into a completely new tactical and technical features that correspond to the latest generation of missile technology. Radical improvement of combat characteristics was achieved by removing the operational inconveniences, eliminating some elements that were difficult to access or unreliable, as well as by improving technical and operational parameters of PRWB OSA.

PRWB modernization proposed by WZU S.A. involves the application of: target identification system running a Mark XII standard Mode 4 with the possibility of upgrading to the Mark XIIa standard Mode 5 and Mode S, passive optoelectronic target detection and tracking devices that allow radio-electronic masking by reducing radiolocation radiation to minimum (an optoelectronic head was used, developed by WZU S.A., composed of day-night video camera, 3rd generation infrared camera and precision laser range finder operating in the eye-safe band), a new digital radar signal analysis system with improved radio-electronic noise immunity (digital modules of large-scale systems integration developed by WZU S.A. were used), circular observation digital indicator and guidance digital indicator displaying all the information gathered from primary radar, secondary radar and imaging the scenery in the visible thermal band (computer-controlled indicators developed by WZU S.A. were used), modern blocks and modules that are the most unreliable or the most significant for the operation of the systems (digital modules of large-scale systems integration or semiconductor systems developed by WZU S.A. were used) and a GPS-assisted inertial land navigation system allowing precise determination of PRWB position.

WZU S.A. is currently working on adapting PRWB to launch new generation of smart missiles.

EFFECTS OF UPGRADE

- increased resistance of the system to passive and active interference
- target identification in the Mark XII Mode 4 UPGRADE Mark XIIA Mode 5, Mode S
- radioelectronic camouflage by limiting radar radiation to a minimum due to application of passive optoelectronic equipment for target detection and tracking (optoelectronic head and video tracker)
- introduction of advanced techniques and algorithms for radar signal digital processing and imaging as well as visual picture from the thermovision and television cameras
- increased resistance to radioelectronic jamming thanks to application of digital radar signals analysis system
- use of advanced parts allowing the supply of replacement parts necessary for normal operations increased detection of low RCS targets
- precise location determination by inertial land navigation system supported by GPS
- system growth capability to launch state-of-the-art missiles
- elimination of adjustments and tuning
- integration of Dehumidification System
- air conditioned crew cabin



LUBAWA SA JOINT VENTURE IN ARMENIA

LUBAWA SA and the Armenian Ministry of Defense of Armenia signed a protocol summarizing the negotiations on LUBAWA SA joint venture activity in Armenia. The arrangements are aimed at starting commercial and manufacturing activities of the company in the 1st quarter of 2013.

In September 29th 2012 in Yerevan, Marcin Kubica - president of LUBAWA SA - and Murad Isakhanyan - Head of the Defence Industry Department of the Ministry of Defense of Armenia - signed a protocol that summarized negotiations that took place between September 27th and 29th and related to the initiation of the LUBAWA SA joint venture activity in Armenia. This protocol included, among others, the company shares division (Lubawa 51%, Ministry of Defense of Armenia 49%), the object of the company, i.e. the production and sale of camouflage covers, military equipment mock-ups, ballistic plates and tents for the Armenian Ministry of Defense.

For Lubawa SA this cooperation with the Republic of Armenia is the beginning of export expansion to the Caucasian republics areas. Lubawa SA recognizes the Republic of Armenia as an example of a rapidly growing former Soviet Union republic. The strategic nature of the partnership with that country, and also the validity of Lubawa SA's actions are also confirmed by the government of our country, including the agreements on strategic military cooperation between the Ministries of Defence of Poland and Armenia - says Marcin Kubica, Lubawa SA president.

Parties' contributions to the aforementioned company will include: Armenian Ministry of Defence - properties, where economic activities will be carried out, LUBAWA SA - technology transfer, personnel training, machinery and modernization works.

This investment brings a few tangible benefits to the Republic of Armenia - from the partial transfer of modern technologies of global standard which Lubawa SA has, through the creation of new jobs and investments of the Polish defense industry in Armenia, as well as equipping the Armenian army with innovative means of protecting the battlefields - says Marcin Kubica.



The parties agreed on a precise schedule for further actions necessary to complete the transaction. Administrative procedures were initiated, designed to register the company and commence operations. The schedule includes the signing of the joint venture agreement between LUBAWA SA and the Ministry of Defense of Armenia in December of 2012 in Yerevan. The agreement will be signed in the presence of official representatives of the Polish Ministry of National Defence.

According to the findings of the Ministry of Defense of Armenia, a joint venture agreement will be signed in Yerevan in December of this year. We assume that the joint venture company will commence its business activities in the first half of 2013, after we finish adapting the buildings, production lines and training employees - says Marcin Kubica.



**MARCIN
KUBICA**

LUBAWA SA, President of
the Board

Lubawa SA owes its position to 60-year presence on the market. Its close cooperation with leading research institutions was also a key factor in its success. Lubawa SA boasts numerous research and development works, realized in cooperation with various institutions, including Wrocław University of Technology, Technical University of Lodz, Institute of Textile Industry, Military University of Technology, Military Institute of Engineering Technology, Military Institute of Armament Technology or Military Institute of Armoured and Automotive Engineering. We also work with foreign scientific and research institutions, such as: VTÚVM Slavcín in the Czech Republic, Banco Nazionale di Prova per le Armi da Fuoco Portatili e per le Munizioni Commerciali in Italy, Defence Forces Technical Research Centre for Signature Management in Finland and FOI in Sweden.

Lubawa SA got various industry awards. Berberys multi-masking coating and NT 2011 technical tent won prestigious Defender awards at the International Defence Industry Exhibition in Kielce in 2011. In 2012 we won the Defender award for our LIFE GUARD SPEC QR bulletproof vest.

We are an innovative company, we adapt to the market and we respond to the needs of our customers.

On the one hand, the development strategy of Lubawa SA assumes strengthening of internal synergy between units that comprise the Corporate Group. On the other hand, we place a strong emphasis on the integration with our strategic partners, for example through the creation of structures similar to the aforementioned joint venture in Armenia. Lubawa SA and its subsidiaries, i.e. Litex Promo Sp. z o. o., Miranda Sp. z o. o., Effect - System SA, constitute a communication platform between academia and business. Lubawa SA is consistently expanding its range of products for civilian and uniformed customers, enriching the existing categories with new solutions, such as mobile camouflage systems, multiscale mock-ups of military equipment, ballistic protection systems for vehicles and others.



JASMINE SYSTEM - TECHNOLOGY OF THE 21ST CENTURY

**JASMINE as a ready, proven and comprehensive
C3I System to support land forces activities**

The Company's Flagship Product - is **Network Centric Data Communication Platform JASMINE**. The system is dedicated to support of command processes of military operations. It comprises the specialized hardware and software. The system is entirely designed by Polish engineers. The product of its kind is currently the only solution (in Poland and also in the wide world). The system is comprehensive, versatile and compact (technology, hardware, software and components - mainly in terms of: HMS, BMS, and DSS). It is reliably proven, scalable and ready to use. The product is unique in many aspects and internationally highly respected. Belongs to a group of **C4ISR** systems (Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance).

THE PLATFORM JUST TODAY SIGNIFICANTLY:

- support command (automation) and management of processes and military operations at all levels down to dismounted soldier;
- creates the situational awareness of troops, including headquarters and staffs, i.a. by creating the Common Operational Picture - COP;
- increases security of troops;
- enable a construction of military, mobile networks in an IP technology (Internet Protocol).

This solution is pioneering and precedent in the field of command and communication. It is entirely a product of Polish engineers and the technology used in it. The mechanisms and services represent a breakthrough in military ICT systems, even abroad. Together with software and devices it constitutes a coherent entirety, which is very flexible, scalable and can be easily adapted to the needs and requirements of the Organizer and User of military communication system.

JASMINE SYSTEM IS PRODUCED IN FOUR VERSIONS:

- shelter version - HMS JASMINE (Headquarters Management System);
- portable version - HMS JASMINE (Headquarters Management System);
- mobile version - BMS JASMINE (Battlefield Management System);
- dismounted soldier version - DSS JASMINE (Dismounted Soldier System).

MAIN COMPONENTS OF NETWORK CENTRIC DATA COMMUNICATION PLATFORM JASMINE

JASMINE System in a shelter version - is called also HMS (Headquarters Management System) JASMINE in a shelter version. It is designed to support command processes of battlefield components and modules and to construct efficient combat networks in IP (Internet Protocols) technology. It also enables creation of Common Operational Picture - COP. It is an autonomous system with a capability to act as a separate product which consists

of devices and software which are built in a electromagnetic proof container on a vehicle. In the most cases this version is comprised of the following software:

- JASMINE Management System, including JASMINE Modules Management (JMM);
- Software Module of C3IS JASMINE - HMS C3IS JASMINE;
- JASMINE Web Portal;
- JASMINE Data Communications Resources Management System.

HMS JASMINE in a portable version is called also HMS (Headquarters Management System) JASMINE in a portable version. It is designed to support command processes of battlefield components and modules and to construct efficient combat networks in IP (Internet Protocols) technology. It also enables creation of Common Operational Picture - COP. It's also an autonomous system





HMS



BMS



DSS



JASMINE System in a mobile version is called also **BMS** (Battlefield Management System) **JASMINE**. It is designed to support command processes at tactical level, to cooperate with **HMS** and **DSS** systems and to construct communication and command onboard systems. **BMS JASMINE** is dedicated to: command vehicles, battle vehicles (including armored personal carriers, tracked vehicles and tanks) other vehicles and flying objects. It is also an autonomous system with a capability to act as a separate product dedicated to vehicles and other mobile objects. This system solution is comprised of devices with a software especially:

- **JASMINE Management System**, including **JASMINE Modules Management (JMM)**;
- **Software Module of C3IS JASMINE - BMS C3IS JASMINE**.

with a capability to act as a separate product which consists of devices and software. It is designed to be used mainly in buildings, tents and shelters. In the most cases this version is comprised of the following software:

- **JASMINE Management System**, including **JASMINE Modules Management (JMM)**;
- **Software Module of C3IS JASMINE - HMS C3IS JASMINE**;
- **JASMINE Web Portal**;
- **JASMINE Data Communications Resources Management System**.

JASMINE System in a version for dismounted soldier - is called also **DSS** (Dismounted Soldier System) **JASMINE**. It is designed to manage dismounted soldier operating in a battle group. **DSS JASMINE** cooperates with **BMS** and when needed with **HMS**. It is also an autonomous system with a capability to act as a separate product. This solution is comprised of devices together with software which meet teleinformatic soldier requirements, especially:

- **JASMINE Management System**, including **JASMINE Modules Management (JMM)**;
- **Software Module of C3IS JASMINE - DSS C3IS JASMINE**.





JASMINE AND INTEROPERABILITY STANDARDS

C3IS JASMINE (including its modules: HMS, BMS and DSS C3IS JASMINE) is the system only one in Poland and one of the few in the world that meet completely all the following standards:

- **MIP DEM Baseline 2 & 3** (Multilateral Interoperability Programme Data Exchange Mechanism);
- **MIP MEM Baseline 2 & 3** (Multilateral Interoperability Programme Message Exchange Mechanism);
- **NFFI** (NATO Friendly Force Information) **V.1.3** (IP1, IP2 - STANAG 5527), **SIP3, HUB**;
- **ADatP-3 Baseline 11C/F, 12.2 & 13** (STANAG 5500);
- **APP6-A** (Tactical symbols), **MIL 2525B, MIP Implementation Rules**,
- **WMS** (WebMapService), **WFS** (WebFeatureService),
- **NVG** (NATO Vector Graphics) **1.4, 1.5**;
- **JIPS** (JCOP Information Product Services);
- **C2IEDM & JC3IEDM** (STANAG 5525);
- **Plans & Orders** (STANAG 2014);
- **Battlefield Directory** (STANAG 4644).

VALUED AND UNIQUE QUALITIES OF JASMINE

Network Centric Data Communication Platform JASMINE includes other unique and valuable (also in the world scale) products developed and produced by our company as follows:

- **C3IS JASMINE System** (C3IS JASMINE) is a comprehensive multilevel system, operates from operational level (**HMS C3IS JASMINE**) down to dismounted soldier (**DSS C3IS JASMINE**). The system provides the opportunity to support the command process for infantry command posts as well as for armored troops (**BMS C3IS JASMINE**);
- **JASMINE Web Portal** is a software module of **C3IS JASMINE System** used at the operational and tactical level. **JASMINE Web Portal** is a network application dedicated to cooperate with **HMS JASMINE** version which provides the Users the access to the functionalities of the **C3IS JASMINE System**. It also enables to create the Common Operational Picture. This solution uses web services technology (Web Services), which provides Users an access to shared operational information by the use of the common web browsers. The main purpose of this solution is to support the command processes by the use of a centralized portal, enabling the effective staff collaboration of all involved in this process groups and sections of the operational level (or on depends of the other tactical level needs);
- **Battlefield Replication Mechanism (BRM)** – provides efficient data transmission even across the narrow band (HF and VHF) radio;

- **Gateway MIP B2/B3** – the only such component on an international scale provides a cooperation between both different standards systems describing theatre of operations. This solution is evaluated as a remarkable achievement, also in the scale of NATO;
- **Multiprotocol NATO Friendly Force Information Proven HUB** (Multiprotocol NFFI Proven HUB) the only one in the world was proven and certified to be used instead of operational **NFFI HUB** developed by **NC3A**. Moreover **HUB** of the **JASMINE System** is able to operate simultaneously many versions of NFFI, for this reason it makes this product unique;
- **JASMINE Modules Management (JMM)** provides simple and transparent way to configure the **JASMINE System** beginning from the network layer through services supporting the command process and operational activities;
- **Information Exchange Gateway JASMINE (IEG JASMINE)** ensures secure data information transfer between different security domains and it is an answer of TELDAT Company for **NATO IEG** concept. It consists of newly developed hardware modules, as: **Firewall Box, IEG FS JASMINE** (Functional Services) and **IEG CS JASMINE** (Core Services);
- **Data Communications Resources Management System K TSA** (include **JASMINE**) enables a real time monitoring of wide area networks with different security levels. Provides tools enabling expert analysis within the IP networks;

- **Safe Exchange Information System (SEIS)** – one of the widest IT systems, working reliably in Polish Armed Forces. The comprehensive and unique system in Europe for safe and reliable exchange of information. Made in the most modern technologies, especially IP data and VoIP. It allows the transmission of: alarms, orders, reports and other documents in data communication networks. It gives the possibility to transfer data to selected recipients of information (signals) anywhere in the world;
- **Tactical Terminal Tablet (12.1")** is an element of on-board or manpack equipment of end users of **Network Centric Data Communication Platform JASMINE**. It can operate as a workstation in the combat vehicle (in cooperation with dedicated adapter), being the part of the **BMS JASMINE** system equipment;
- **Personal Tactical Terminal (7")**, is an element of on-board or manpack equipment of end users of **Network Centric Data Communication Platform JASMINE**. It is designed as a manpack equipment and dedicated to i.a. **DSS JASMIN** system.

Above presented tactical terminals nowadays are the newest TELDAT solutions and currently the products of its kind in Poland and unique in the world. They meet all military standards in terms of climatic and environmental conditions as well as shock resistance. The terminals can operate also under water.



NEW ARMS FACTORY IN RADOM

Construction of the most modern arms factory in Europe has started

In the presence of Marshal of the Sejm, Ewa Kopacz, Minister of the Treasury Mikołaj Budzanowski, Radom city mayor Andrew Kosztownik, and: President of Bumar Group Krzysztof Krystowski, President of Industrial Development Agency, Wojciech Dąbrowski and President of Łucznicz Arms Factory, Tomasz Nita, the construction of the new Łucznicz Arms Factory has officially started.

The new arms factory with its distinctive triangular logo will produce the most modern firearms in Europe. I am very glad that the resources gathered for the implementation of this project will translate into not only new buildings but also the most modern production lines of firearms in Europe - said Marshal Ewa Kopacz at the ceremony.

The new plant, whose construction was started today, there is Tarnobrzeg Special Economic Zone Euro-Park Wisłosan, in Radom sub-zone. The advantage of the new plant will be its location that provides a very good road and rail connections to the rest of the country and Europe. In the new factory, production line technologies will be com-

pletely changed, new technologies and production methods will be introduced and computer systems will be implemented. The plant is intended to focus on precision machining of metal and aluminum on CNC machines.

Minister of the Treasury, Mikołaj Budzanowski, referred to the words from the Prime Minister Tusk's second exposé: More than a month ago, the Prime Minister announced a multi-billion dollar investment to modernize the Polish army. And those promises are becoming a reality today.

Construction of the new factory is a practical implementation of the agreement from August 28th 2012 between the Industrial Development Agency and Bumar Group. Under the agreement, the IDA will finance the construction of production and administration objects, and Bumar Group will finance the modernization of machinery and implementation of new products: 5.56 mm caliber Modular Firearm System and 9 mm caliber semi-automatic pistol.

Krzysztof Krystowski, President of Bumar Group, stated that this investment marks the start of the whole series of new investments in Bumar Group, including new research and development projects. He

also stressed that Prime Minister Tusk is the first one to look at the defense industry not as a problem but as a factor for new investments and innovation in the national economy. He said that Bumar Group is the only Polish company with revenues amounting to more than 1 billion USD, and is one of the leading European companies in the land military defense industry. Therefore, it is a natural leader in the implementation of new technologies and innovations in the Polish defense industry.

The new arms factory will consist of three buildings: the production hall, testing facility and storage facility (13,467 m²) as well as an office building (2,800 m²). Completion of the investment is planned for the end of the first quarter of 2014. Rosabud SA, a construction company from Radom, will be the primary contractor for this project.



ONE VEHICLE - MANY POSSIBILITIES

The design of the Rosomak vehicles provides mobility, large remaining capacity, ability to swim and wade, overcome significant obstacles and inclinations, as well as a buoyancy reserve for the installation of special equipment. This makes the Rosomak an ideal vehicle for the army and soldiers.

The vehicles are capable of carrying 11 soldiers, including the driver, and the turret operators in the combat version. The design of the chassis and suspension of the Rosomak vehicles allow for a fast repair and replacement in case of a failure. The design of the integrated suspension arm proved itself to be more resistant to booby-trap explosions and more effective in case of repairs in the field conditions. An important condition for the introduction of the Armored Modular Vehicle to the Polish Army equipment is the gradual transfer of the production to Poland. Currently, a significant part of the components, starting with the armor plates and ending with the advanced elec-

tronics, comes from the domestic manufacturers and suppliers. Also the special versions incorporated in the Rosomak vehicle are mostly Polish designs and solutions. Due to the solutions and the commitment of the domestic potential, the process of transferring the production to Poland is progressing faster than planned.



PHOTO: WZM S.A.



PHOTO: WZM S.A.

THE EFFICIENCY AND ERGONOMICS

The first testimony on the fulfillment of the expectations concerning the vehicle modernization, are the changes and improvements made so far, to the structure and the equipment of KTO Rosomak.

- Since the commencement of the production in the April of 2005 to the present, more than 200 changes and enhancements have been introduced, newer equipment has been added, providing better parameters, higher reliability and fully meeting the expectations concerning the exploitation or improving the technical parameters. The design allowed for the modification of hydraulic and pneumatic systems, to ensure the correct and long-term operation at higher temperatures and lower atmospheric pressure and was a result of the experience gained in the operation in Afghanistan - says Zbigniew Chabera (The Deputy Executive Director for Customer Support).

Tires more resistant to high temperatures and rocky surfaces have been introduced. The air-conditioning and the cooling systems have been improved, a number of measures required for asymmetric operations, such as side cameras and screens for the troops have been introduced. The system indicating the sector of fire has been installed, the vehicles have been adapted for the mounting of active jamming devices and the Blue Force Tracking system. For the servicing time, the fire protection switch has been applied; the vehicles have been equipped with additional compartments and containers for equipment

placed in the propeller locations, previously used while swimming.

- Many of the changes are to improve the ballistic resistance of the vehicle. First of all, the vehicles used in the ISAF mission are additionally armored to meet the level IV according to the STANAG 4569 and equipped with a light system of shields against the RPG 7 projectiles fired from handheld antitank grenade launchers. The RPGNet system can be mounted and dismantled by the crew, which allows for a simple air transportation of KTO Rosomak - says Krzysztof Omyliński (The Deputy Executive Director of Development and Marketing).

NEW IDEAS BY ENGINEERS

The light netting system covers all the types of Rosomak vehicles used by the Polish Task Force in Afghanistan - from the combat types, through the versions with open turrets, ending with the Rosomak-WEM medical evacuation vehicles. The KTO's design has also allowed to improve the ergonomics by removing the two seats from the landing compartment. The WZM SA now offers the replacement of seats with a special explosion-proof construction including multi-point safety belts, which can significantly offset the kinetic energy of an explosion under the vehicle or in its vicinity. The drivers now have a new passive device for night driving characterized by a significantly improved performance and viewing angle.

THE CONSTANT DEVELOPMENT OF THE SPECIAL VERSION

The engineers have developed a new type of battery fitted with a unit of rectifiers in a universal casing. This solution improves the energy balance of the vehicle, resulting in a longer operation of the electrical and electronic components of the weapons without the main engine operation. One of the latest ideas of the WZM SA's development engineers is the modular design of the turret plate to enable the installation of various turret solutions or special systems according to the specific needs of the user by upgrading one element of the vehicle's top plate. This functionality is the result of the experience with the installation of the MAHSW automatic mortar and the 105mm CT-CV turret using the KTO Rosomak chassis.

The special versions of the KTO Rosomak are developed systematically. In addition to the well-known basic version of Rosomak and the combat version including the Hitfist 30P turret used in the mechanized battalions, the army has commissioned the Rosomak Medical Evacuation Vehicles, which undergo a complete cycle of the commissioning, including the swimming. The MEVs have a 4-person crew and the ability to carry three wounded on stretchers and four injured in a sitting position, to whom the first aid and support of the vital functions is provided during rapid evacuation and transportation from the battlefield, in a safe armor, to the nearest medical point.

- *The Rosomak MEV is equipped with day-and-night devices for the search of the wounded in a battlefield, modern medical and resuscitation equipment and the roll-in stretchers capacity compatible with the NATO standards. The MEV vehicles serving the Polish soldiers in Afghanistan are characterized by the ballistic resistance and the resistance against HEAT projectiles, just as in the combat vehicles - says Krzysztof Omyliński (The Deputy Executive Director of Development and Marketing).*



PHOTO: WZM S.A.

Since the beginning of 2010, the vehicles delivered to Afghanistan have been painted in a uniform desert camouflage, which has been tested in terms of properties preservation for military equipment in accordance with relevant provisions and standards. A new version of the vehicle painting, using washable paints for winter conditions is also available, and has been tested in accordance with the provisions of military masking and camouflage.

- *The ISAF version of the Rosomak vehicles for the Polish Task Force in Afghanistan has different parameters to those of the vehicles used for training in the country. Most of all, they have been provided with a greater ballistic resistance and combat functionality due to the installation of the additional combat equipment related to the operations in Afghanistan - said Michał Rumin (WZM Spokesman)*

The maximum weight of the vehicle has been increased from 22 500 kg (to this value, KTO Rosomak provides the ability to swim with about 20 percent displacement margin) to 26 000 kg. For the purposes of the expeditionary operations, two versions of Rosomak with open turrets have been manufactured. For the operation in the European Union's Forces (subsequently taken over by the UN) vehicles with light and automatic turrets have been designed for the application of a wide range of arms and an automatic grenade launcher for the Polish ISAF contingent.

The Rosomak-S version is designed to transport Spike sets with the operating crew. The vehicle allows for an efficient and rapid transport of two teams to the area of operations and the maintenance of a stable communication between the vehicles and the command center. The operational compartment has been adapted and retro-fitted in relation to the basic version of the KTO. The vehicle retains all the other functional and operational features of KTO Rosomak.

- *The Rosomak-WD, configured as a tactical level command vehicle of a mechanized subunit, with respect to the specification of the operation and the commander's needs, will be characterized by similar functionality. The vehicle is to be equipped with communication systems, data transmission and fire control to ensure full control at this level of command - says (Krzysztof Omyliński (The Deputy Executive Director of Development and Marketing)).*



PHOTO: WZM S.A.

THE IMPLEMENTED ROSOMAK VARIANTS:

- Medical Evacuation Vehicle- Rosomak MEV (Rosomak WEM)
- Vehicle for the transportation of the Spike team
- KTO Rosomak suitable for PKW ISAF (M1M version with the HEAT resistant RPGNet QinetiQ and the Armstal 550 steel hull by the Huta Stali Jakościowych
- KTO with the automatic open turret for the PKW ISAF
- KTO with the light open turret for the PKW CZAD
- Rosomak NJ - training vehicle
- Multi-Sensor Surveillance and Reconnaissance System - Rosomak WSRiD
- The Contamination Reconnaissance Vehicle- Rosomak RSK
- The Technical Support Vehicle - Rosomak WPT
- The Technical Reconnaissance Vehicle- Rosomak WRT
- The Anti-aircraft Command Vehicle - Łowcza, Rega
- The Tactical Level Command Vehicle - Rosomak WD
- Training Vehicle - Rosomak NJ
- The General-Military Reconnaissance Vehicle - R1 command version and R2 line version
- The Fire Support Vehicle based on the CT-CV 105 mm turret

Within the development, procurements or direct operations, the WZM SA has developed new special versions of the KTO:



PHOTO: A. KIŃSKI



PHOTO: A. ROIK

FIRST KRAB HOWITZER IN THE ARMY

On the 30th of November, the first battalion fire unit will be delivered to the Józef Bem's 11th Masurian Artillery Regiment in Węgorzewo.

Krab 155 mm self-propelled howitzer, after several years of the contract to purchase the technology will go to the Army. 11th Masurian Artillery Regiment will receive eight Krab howitzers, including upgraded prototypes accepted for mass-production, three command vehicles, ammunition vehicle and armament and electronics repair vehicle.

The new weapon has greater range and allows the use of NATO standard precision ammunition. Tactical-technical requirements for the 155 mm artillery system were formulated by the Ministry of National Defense in 1994. In 1997 a tender started, where five offers were made; offers from Germany, South Africa, Slovakia and the UK were qualified for further proceedings.

The tender was cancelled due to lack of funds. In the same year another tender was launched for military and technical cooperation. Of the two bids submitted, only one made it to the last phase - the British modernized AS-90 Braveheart howitzer. Cannon turret to be exact, since one of the requirements was the option to connect the licensed turret with a Polish chassis.

In July of 1999, an agreement was signed on the technology transfer from GEC Marconi (currently BAE Systems). British Braveheart - Chrobry in the Polish variant - was integrated with Kalina chassis and called Krab.

In 2000, the Department of Armaments of the Ministry of National Defence signed a contract with Wola Steelworks to supply two prototypes. Introducing a new generation of 155 mm howitzers equipped with a modern fire control system in 2003 was one of the Poland's obligations towards NATO. However, the contract for the implementation of the battalion fire unit was signed in 2008. The contract amounted to more than 220 million PLN and aside from Krab it also included Azalia (fire control system) and Waran (secure logistics, including supply vehicles) projects.



INCREASED EFFECTIVENESS AT THE BATTLEFIELD

The main change relates to the caliber from existing 152 mm NATO caliber to 155 millimeters. It's only three millimeters, but it is essential to opening up access to precision ammunition. Laser- and GPS-guided ammunition can hit with accuracy of a few meters and destroy the target directly, not by firing through the entire area.

Precision ammunition does not hit the surface, on which the tanks stand, but the tanks themselves. In addition, greater accuracy means lower costs - instead of firing hundreds of shells, it's enough to fire just a few, and with the reduced dispersion, the losses among the civilians can be minimized.

Krab's prototype was the British AS-90 howitzer, which had a barrel length of 39 calibres, while Krab has the barrel length of 52 calibres, which increases its range. Krab can fire at 40 km, while the Dana howitzers that were used so far had a range of 18 km. This enables the army to move its artillery to safer distance in case of any conflict. It is also worth mentioning that 60 km gliding ammunition is also available and 100 km ammunition is also being designed. The Polish howitzer can use any ammunition that meets the NATO ballistic requirements for 155 mm projectiles.

POLISH ARMY GETS NEW WEAPONS

On the 30th of November, the first battalion fire unit will be delivered to the Józef Bem's 11th Masurian Artillery Regiment in Węgorzewo. It will comprise eight Krab howitzers, including upgraded prototypes accepted for mass-production, three command vehicles, ammunition vehicle and armament and electronics repair vehicle.

So far, 80 soldiers were trained in operating the new equipment. Experiences with the use of the first Krab howitzer module and assisting vehicles were given to the manufacturer in order to get rid of any concealed defects.

By the end of 2015, HSW will provide 16 more Krab howitzers, 8 command vehicles and 5 ammunition vehicles - in 2016 the battalion fire unit will be complete and will comprise 24 howitzers. The contract value for the equipment of the whole battalion amounts to 550 million PLN.

THE POLISH INDUSTRY CONSTRUCTS SPY AIRCRAFTS

FlyEye is the first unmanned reconnaissance and patrol aircraft, developed and built from scratch by a Polish company, WB Electronics.

FlyEye is an entirely Polish mini UAV constructed by the Flytronic engineers, a member company of WB Electronics seated in Gliwice. The aircraft has been first publicly shown on the 14th of June 2010 at the Eurosatory in Paris. In the October of 2010, the NIL military unit has announced a tender for the supply of two sets of the unmanned aircraft vehicles. WB Electronics, which has presented a slightly modernized version on the 10th of December of that year, has been awarded the order.

– *The FlyEye UAV combines the characteristics of the larger solutions of that type. These are the endurance, the possibility to determine the coordinates, the stabilized optical head with two sensors allowing for the night and day observation. All this is complemented by the operating comfort resulting from the more compact design - says Dariusz Sobczak, the Director of Marketing and Sales at WB Electronics.*

Following the Aeronautics Orbiter, Aeronautics Aerostar and the Boeing ScanEagle, The FlyEye will be the next unmanned aerial vehicle at the disposal of the Polish Armed Forces. The FlyEye UAV sets have already been supplied for the Special Forces Command.

– *The FlyEye UAV can be used for the purpose of imagery intelligence (IMINT) and in tasks requiring additional information about the observed object - such as geographic coordinates, calculated by the system with accuracy better than 15 m - Dariusz Sobczak adds.*

THE USER MANUAL

With the application of the static thrust of the drive similar to the airframe mass, for the take-off purposes, the aircraft is released from hand. This way, the issues of logistics related to the system are extremely simplified (no launcher applied). The possibility to launch the UAV in very narrow spaces, such as urban areas or forest clearings is another advantage of this system. The UAV can be controlled manually - from the control station or operate autonomously, along the pre-programmed route with the possibility of introducing manual adjustments during the flight.



– *The handling of aircraft is extremely simple. Besides the two trained operators carrying the equipment in backpacks, literally no other infrastructure to start the plane, carry out the observation and land safely is necessary. To set up the station, a small open outdoor area of about 50 to 100 meters is required, and that's it - Dariusz Sobczak says.*

The landing system consists in the automatic drop of the battery tray and the surveillance payload using a parachute. The tray drop moment is calculated by the on-board computer to allow the parachute to safely deploy and descent to the pre-programmed point of contact with the ground. The landing accuracy range is within 10 meters. This solution allows for an effective protection of the most expensive part of the system, that is the surveillance payload as well as the maintenance of full steering capability of the aircraft in the final phase of flight at minimum speeds.

THE DEVELOPMENT PLAN

WB Electronics constantly works to improve its newest product.

– *Our plan is to extend the flight endurance, as -with respect to our clients- this is the most desired feature. Today, we are limited by the available battery technology - the aircraft is driven by an electric motor. As the technology advances, we should be able to provide longer flight times. We have also been examining a new kind of dedicated surveillance payloads. As the FlyEye has been completely designed by our engineers, we have the flexibility to introduce changes and improvements, at the customer's request - says Dariusz Sobczak*



**DARIUSZ
SOBCZAK,**
the Director of Marketing
and Sales at WB Electronics

The FlyEye UAV inspires a great interest of the foreign customers. The Polish design has first entered the market

that, even few months ago, seemed to be dominated by the manufacturers from Israel and USA. As the design is relatively new, it incorporates the most modern solutions. The potential customers ask both, about the possibility of purchasing as well as offer cooperation in the development of custom solutions. We do not reject this form of cooperation. Many foreign customers are at the stage of evaluation or the summary of presentations that we have performed in the conditions determined by the clients. I suppose that in 2013, the FlyEye will be operating permanently in the airspace of one of our non-European customers.





THE FEATURES

Description

- The entire system is handled by two operators.
- The drive of the UAV: a silent electric motor powered by lithium polymer batteries.
- The launch of the UAV from hand. During the take-off and landing, no auxiliary elements are required.
- The Safe Landing System of the platform due to the innovative surveillance payload protection method.
- The Ergonomic ground control station of the flight (LGCS).
- The ease of the assembly and disassembly of the UAV, modular design, readiness to start the system achieved in less than 10 minutes.
- The basic version of the system can be carried in two backpacks.
- The communication system operating in the NATO harmonized band for mobile applications (4.4 - 5.0 GHz).

The Applications

- - Determining the coordinates for the artillery,
- - Interaction with artillery systems as a means of reconnaissance,
- - Observation of the battlefield,
- - Escorting,
- - Surveillance of the national borders,
- - Protection of mass events,
- - Monitoring of natural disasters and their consequences,
- - Monitoring of forest fires,
- - Searching for missing persons e.g. in forest areas.



The surveillance payload placed under the fuselage
Such a solution provides a better range of observation than the surveillance payload at the front of the UAV.

Two cameras in the surveillance payload
This allows the quick switch of the video imaging.

Flight simulator allowing for video synthesis
The simulator allows for the regular training of the crew, regardless of the weather conditions and the availability of airport infrastructure. The simulator allows to conduct training in the scope of:

- Mission planning,
- Setting up and controlling the parameters of the system,
- The mission performance in simulated environmental conditions (wind, turbulence),
- The simulation of the payload use and reconnaissance...

The possibility to control the system using two separate LGCS Light Ground Control Stations
(Such as the UAV system operator and the commander)

The advanced systems for the improvement of flight safety
(e.g. the anti-spin system, the protection against the Prandtl tube icing)
The automatic flight mode for escorting
(using the mobile transceiver station)

The remote video terminal (RVT)
Portable and compact - does not require a large antenna system while providing very good ranges, including the built-up areas.





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WB Electronics, a private company of Ożarów Mazowiecki, with entirely Polish capital, is one of the major companies of the Polish arms market.

The company, as one of the major suppliers for the Armed Forces of the Republic of Poland, has been actively contributing to improving the defence capabilities of the Polish army for more than twenty years. This contribution consists in creation of new technologies as well as modernisation of military equipment. Compared to large world corporations, WB Electronics is a small company, but with a comparable range of product offerings. WB ELECTRONICS for years has consequently been conquering new areas of electronics and IT applications in the military technology. Proprietary solutions in new technology make it possible to develop innovative products with unique utility properties.

The offerings of WB Electronics include mainly military electronics, software as well as services associated with integration of military vehicles. The primary client of WB Electronics are the Armed Forces of the Republic of Poland. The company is also actively involved in overseas trading.

The technology offered by WB Electronics is based on long-term experience resulting from the use of the company's solutions implemented in the Polish army as well as from participation of WB Electronics in international tenders and long-term cooperation with the most demanding customers from around the world.

WB Electronics is a resilient and rapidly growing company, which undertakes new challenges in the field of development and modernization programs for security and defence.

Consistency, perseverance, commitment and the belief in continuing development makes company one of the best participants in the Polish and foreign arms markets.

The strategic directions of development of the offer of WB ELECTRONICS S.A. include:

- C4ISR systems - integrated command support systems and battlefield visualisation systems,
- Software - integration of platforms and systems
- Military Electronics - gun and cannon automation, communication systems, sensors, computers and terminals,
- Integration of Military Vehicle Electronics - in combat vehicles, command vehicles, reconnaissance vehicles, specialist vehicles as well as gun and cannon automation



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Areas of activity Military Institute of Armament Technology is the leading scientific - research centre that has been creating new developments for 80 years to be used by the Polish Armed Forces.

Institute is involved in:

- scientific - research and development works;
- new design and upgrading projects;
- prognostic and expertise reports;
- functional tests;
- standardisation and unification;
- software for command and fire control systems.

Small Arms and Aircraft Weapon Systems

- analyses and prognostic reports for small arms;
- research, development and design works on small arms weapons and ammunition;
- aircraft and small arms weapons testing;
- methodological and experimental works on aircraft and small arms weapons service life extension;
- aircraft and small arms weapons expert reports and analyses.

Artillery

- analyses and prognostic reports for artillery weapon systems;
- research and design works on artillery weapon systems;
- testing and upgrading of artillery systems;
- designing, upgrading and testing of artillery ammunition;
- designing of training ammunition, aerial target imitators and fuses for training and service ammunition.

Service

- theory of using and systems - models and projects for subsystems and components of servicing and using of explosive ordnance;
- technical diagnostics - methods for evaluation and diagnostic examinations, quality assurance and prognosis, explosive ordnance safety and functional reliability;
- evaluation and post-incident expert reports for explosive ordnance;
- using of missiles and rockets in decreased range dimensions;
- testing of combat effectiveness for rockets and missiles and prognostic reports for extension of their service life time;
- repair technologies, upgrading works and non-destructive testing of rockets and missiles.



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Wojskowe Zakłady Uzbrojenia SA is a defense industry company focusing on the sector of defense rocket launcher technology, mostly mid- and long-range. The company has extensive experience gained during the 50 years of providing services related to repairs and upgrades of missile defense technology to the Polish Armed Forces.

The Company's mission is to achieve innovative growth in order to support the security of Poland and to maintain a level technical condition of weapons and equipment used by the Polish Armed Forces and by the armed forces of Poland's allies that will allow them to maintain their combat effectiveness and to comply with the applicable NATO standards. Such growth must be in line with Poland's national security policy and must assure full satisfaction of the Company's customers, as well as continuous improvement of the Company's employees and full use of their capabilities.

Wojskowe Zakłady Uzbrojenia SA is a professional company that supports Poland's engineering ideas and promotes the development of new technologies and the implementation of innovative solution in the missile technology used by the Polish Armed Forces. The Company's achievements in this area are highly valued by Polish engineers and scientists, as well as foreign defense and military experts.

The Company has become an important player in the missile defence technology upgrade sector and is one of the leading European companies in the sector of anti-aircraft missile systems repairs.



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Lubawa SA is experts in the field of ballistic protection, technical and pneumatic tents as well as special coated fabrics. The experience of company has been confirmed by NATO certificates, quality management standards as well as special production and trade controlling systems. Due to these facts, Lubawa is able to manufacture every product and meet all expectations of services responsible for public safety. It is proved by domestic and foreign orders placed with Lubawa SA.

The company specializes in industrial safety systems. Products of Lubawa SA distinctive by their functionality, shape and coloring can be seen in every construction site and project requiring works to be done at high altitude. Customers' safety is a challenge and mission for Lubawa SA. The potential, market position and long-term experience of the company allow us to pick up the glove on the new fields. Pneumatic tent systems become Lubawa SA's "hit" products. They are assigned for active contractors offering their services and products wherever the customers expect it, it means even in the field conditions, far from civilization infrastructure and facilities. In such places we are always ready to meet requirements of our clients.

Lubawa SA is present in the market since 1951. Since 1996 the company is listed on Warsaw Stock Exchange. The company fulfills orders of Polish Army, Police, Polish Border Guard, State Fire Service and municipal guards. Lubawa SA supplies also tourism and industrial safety sectors.

The company has a certified quality management system meeting requirements of PN-EN ISO 9001:2008 standard as well as system ensuring quality meeting NATO AQAP-2110 requirements. The following certificates have been awarded to Lubawa SA: ISO 9001:2009, AQAP 2110:2006, WSK and WI Conformance Certificate.





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Bumar sp. z o.o. is a leading supplier and exporter of armaments and military equipment manufactured in the Polish defence industry.

For over 40 years the company has been a leader in the domestic and international market of weaponry, construction plant, mining and handling equipment. Its extensive experience, world-recognized and distinguishable brand, achievements in implementing new technologies in the Polish industry and in initiating relationships with renowned producers all over the world, professional and skilful personnel are company's main assets. Bumar has been supplying and selling its equipment and services to the Polish Army and in over 40 countries in Europe, Africa, Asia, South America and the U.S., winning many international bids.

The Bumar Group was formed in 2002 as a result of adoption of Strategy for Structural Transformation of the Defence Sector Capacity 2002-2005 by the Polish Government.

Bumar sp. z o.o. was appointed the integrator of the newly formed Bumar Group, with the responsibility for exercising owners supervision. The Bumar Group consists of 22 manufacturing companies from the Polish defence industry (PPO) specializing in munitions radars, rockets, armour and vehicles including 2 trade companies. Some of the dependent companies form capital groups. Bumar also holds shares in other companies, including foreign ones. More than 50 entities belong to the Bumar Group.

The internal structure of the Bumar Group form Bumar Electronics SA, two capital subgroups Bumar Ammunition SA and Bumar Soldier SA and the product division Bumar Land.

Market activities of the Bumar Group are concentrated around four product groups constituting the subject matter of production and service divisions respectively:

- **BUMARAMMUNITION:** ammunitions and missiles (shooting ammunition, artillery and missiles, SPIKE, GROM, FENIKS missiles);
- **BUMAR SOLDIER:** the soldier and the official (individual equipment and armament of the soldiers including: pistols, guns, optoelectronic equipment, protective means: gas masks, helmets, bullet-proof jackets);
- **BUMAR ELECTRONICS:** electronics and IT (commandment systems, radars, sensors, anticraft and anti-missiles systems);
- **BUMAR LAND:** land platforms (wheel, caterpillar platforms, military vehicles, tanks, special vehicles, technical backup vehicles, bridges).



TELDAT

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TELDAT is a Polish business entity, which has been dynamically operating in the defence market for sixteen years. It is the leading constructor and producer of the world's most innovative data communications solutions, which are dedicated mostly to security and national defence.

The solutions has been awarded by Buyers and Users (also from NATO). TELDAT solutions in many cases are unique in international scale and reference to the systems of other countries. Their advantages and reliability have been confirmed by the following certificates and awards signed by NATO Communications and Information Agency / NATO C3 Agency.

The company has the all necessary capabilities to meet requirements and standards imposed to the companies participating in bid projects and research and development in the area of C4ISR systems. It comprises: research and development, production capacity and service, lessons learned drawn from the participation in NATO and USEUCOM exercises, certificates, awards and honors. These attributes locate the company closely to the top of producers of the specialized military data communication solutions.

Since the beginning of its operation the company has been involved in: research & development, designing, development and production, implementation and maintenance (including remote supervision) of specialized electronic, data communication, IT, telecommunication and alarm systems and devices dedicated mostly to security and national defence.

In this field company has collaborated with many national and international institutions which develop for security and defence. TELDAT has provided for them with research and development, supplies, technical support of implementation and maintenance of specialized data communication systems (including mobile and stationary versions), which are implemented into the Polish Armed Forces (in accordance with required procedures).

All of above mentioned activities have been performed with the highest accuracy, faultlessly and always on time what is confirmed by awarded certificates, prizes, numerous references.

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The institute is involved in the innovative work in the following areas:

- Designing and Integration of Aeronautical Systems
- Logistics Systems
- Safety and Reliability
- Unmanned Aerial Vehicles
- Training Systems, including E-learning
- Air Armament
- Airfield and Road Infrastructure
- Substitute Fuels, Working Liquids and Lubricating Oils
- Biocomponents in POL's Engineering Products

We've got:

- NATO Commercial and Government Entity Code (NCAGE) 0481H
- The State concession No. B-404/2003 granted by the Ministry of the Interior & Administration
- The Internal Audits System No. W-45/5/2012 in the field of scientific research to support operation/maintenance of military aeronautical systems
- The Industry Safety Certificate of the First Degree No 3/I-38/T/W III/2009