

# INTERNATIONAL AVIATION & MILITARY GUIDE

Special analytical export project of Industrial Weekly

№ 05 (23), May 2018

**Rosoboronexport**  
Exclusive state  
intermediary agency



**Best weapons**  
Russian holding creates  
hi-tech innovative arms



**MOTOR SICH JSC**  
Quality and reliability  
of aircraft engines



**ArmHiTec-2018**  
Companies from  
12 states of the world



**KADEX  
2018**  
SPECIAL  
PARTNERSHIP



**High-tech innovations  
for Central Asia**



# KADEX 2018

## V INTERNATIONAL EXHIBITION OF WEAPONS SYSTEMS AND MILITARY EQUIPMENT

23-26 May 2018, Astana  
Republic of Kazakhstan

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## EDITORIAL



### Presumption of Security

It has become already obvious and undeniable that security is becoming increasingly important among the various values of civilization. Today, for any state, the ability to reliably and securely protect the territory, residents and values is a priority.

Political situation in the world (conflicts, sanctions, threats of war and other) makes nations once again reconsider their defense possibilities. Threat of local conflicts to be evolved into global ones, failure of worldwide system of safety and nonending crisis – all of this leads to an unstable and dangerous situation.

One can predict raise of defense means market in times like this. But together with developing of defense technologies in order to secure people's safety, rivalry among sellers of weapons and defense systems increases in order to achieve such goals as increasing profits and market share. KADEX2018 presents in Kazakhstan the best weapons and innovations for global security, which are the undisputed world leaders on price and quality in their segments.

These exhibition and conference will show that it is not serious about how many weapons you have, but quality and possibilities of every single one of them is fact what leads to victory on the battlefield. Other significant factor is technological independence from seller – modern technologies make it possible to shut down any device from any place of the globe if you have appropriate access. With hitech products, solid aftersales service and proven reliability, Russia is honest and friendly partner for all countries, ready for mutual work.

Taking part in KADEX2018 Russia continues the policy of open partnership with the countries of the CSTO (Collective Security Treaty Organization). Russia has a wide product line that meets all the needs of defense in this region.

Valeriy Stolnikov



## HELICOPTERS LAUNCHED TESTS

VR-Technologies design bureau, part of Russian Helicopters (part of Rostec State Corporation) started bench tests of the main systems and assemblies of VRT300 unmanned helicopter. Aircraft flight tests are scheduled to begin by the end of 2018. To date, functional and technical configuration of civil unmanned helicopter has been agreed with a range of Russian companies and authorities. This configuration has become a basis for the development of flight prototype with MTOW of 300 kg. This prototype will be used as a flying test-bed for testing of all UAV's systems and equipment, as well as for testing of its interaction with payload elements and ground-based monitor and control equipment.

To date, we have defined configuration and technical requirements for this helicopter, and carried out an extensive work to select suppliers of the main systems and assemblies of VRT300. The start of bench tests serves as a reference point, and if everything goes as planned, by the end of this year we will start flight tests. Technical solutions of VRT300 will ensure the level of failure-free operation, reliability and safety that is required for the operation in the international market of civil UAVs', – Alexander Okhonko, VR-Technologies director general, said.

VRT300 system is developed in two versions: Arctic Supervision – equipped with a side-view radar for ice reconnaissance and operation in Arctic conditions, and Opticvision – with increased flight range to perform monitoring and remote sensing missions.

The priority missions of VRT300 Arctic Supervision is to expand transport infrastructure of the Northern Sea Route, as well as to aid in the Arctic Regions' exploration. For that purpose, the UAV has been equipped with a side-view high-resolution on-board radar, which allows for a prompt assessment of ice sheet dynamics. A heavy-oil engine and shipborne capabilities make the Arctic version of VRT300 irreplaceable for icebreakers and drilling platforms.

Due to a big payload of 70 kilograms the aircraft can transport various cargoes, such as food and medical supplies, can be engaged in search-and-rescue operations and used to determine the size of ice fields suitable for scientific Polar stations.

VRT300 in Opticvision configuration is designed to improve the diagnostic system, prevent and eliminate emergency situations in the area of energy sources development and transporting. Its other missions include: diagnostics of overhead power lines, mapping, cargo transportation, exploration works, as well as monitoring of environmental situation, roads and roadside infrastructure.

## India's Delegation in Ulyanovsk

*India's delegation led by Mr. Apurva Chandra, Director General Acquisition of the Ministry of Defense, on tour of defense facilities in Russia's Privolzhsky Federal District visited Ulyanovsk-based AviaStar-SP, constituting a part of the United Aircraft Corporation's Transport Aviation Division.*

Russian specialists made a detailed presentation of Russia's state-of-the-art IL-76MD-90A and IL-78MK-90A aircraft.

The rather high interest of foreign specialists in the IL-76/78 family is attributed to its versatility, providing deployment in various roles to include fire-fighting, tanker, transport, flying hospital, airborne CP, and AWACS.

The aircraft is suitable for regional airlift of troops, military equipment, and cargo, as well as their air dropping. The IL-76/78 can be deployed from unpaved runways, something to consider since not all military transports in the world can boast such capability. Being consistent with ICAO's noise and emission requirements, Russia's advanced Ilyushins also service international commercial lines.

Specialists tend to call the platform a 'Universal Soldier', capable of performing tasks in the most complex climatic and weather conditions anywhere in the world. Besides, its deep modernization encompassing deployment of new avionics makes its operation far easier, while replacement of the original D-30KP2 engines with modern PS-90A-76s results in bet-

ter performance and cost effectiveness. Another point in favor of the new power plant is that it will run well even at +40°C without trading off the take-off weight.

'Indian pilots have first-hand experience in flying Ilyushins catering to operational and tactical needs of their military. This explains our meticulous assessment of Russia's modern military transports and tankers, as well as AWACS aircraft based on the platform,' explained Mr. Apurva Chandra.

Russian Ilyushins have proved to be reliable and effective heavy-lift aircraft. India has accumulated considerable experience in operating the type. This and the infrastructure already established in India will prove to be instrumental in providing commonality of parts and components for its aircraft fleet, as well as training and maintenance systems. Besides, the price tag and maintenance costs are relatively low compared to what other manufacturers of similar platforms offer. In terms of cost-effectiveness the Russian ILs are superior to almost every other aircraft, which in itself is a quality mark.



'India is our longtime and reliable partner. It is very much symbolic that paving the way for a full-fledged cooperation of the two countries in aviation were two IL-14Ss in the Salon (VIP) configuration gifted by the head of the Soviet state to the Government of India. As of today, India's Air Force and Navy have between them a considerable number of Russian-made aircraft with Ilyushin's IL-76s, IL-78s, and IL-38s among them. Russia is ready to both upgrade the aircraft already in service and supply new equipment meeting long-term requirements of Indian partners,' noted UAC's Vice President for Transport Aviation and CEO of Ilyushin Aleksey Rogozin.

## Creating VRT500 prototype

*Russian Helicopters (part of Rostec State Corporation) will produce light utility helicopter prototype, VRT500, designed by VR-Technologies design bureau, by the end of 2019.*

Helicopter rotor system strength tests are now underway. VR-Technologies' specialists are going to start aerodynamic tests in the nearest time.

The helicopter is expected to be supplied in the following configurations: passenger, utility, cargo, training, VIP, and Medevac. VRT500 will be the first Medevac helicopter in the world in the segment of helicopters with maximum take-off weight up to two tons to ensure loading and unloading of unified gurneys through the rear cabin doors, which simplifies the process and allows significantly reducing time.

This helicopter combines high flight performance and a great price with operating costs, in addition to its spacious cabin, largest in its class. These characteristics shall allow VRT500 to occupy up to 15% of the global market of civil helicopters with maximum take-off weight up to 2 tons. We expect to produce and sell an average of 700 helicopters by 2030', Alexander Okhonko, VR-Technologies director general, said.

According to him, about 30% of supply would be destined to the countries of Latin America and the Caribbean and about 15% would be

sent to North America, Asia-Pacific region, Europe, Russia and CIS.

VRT500 is a light single-engine helicopter with coaxial rotor scheme and 1600 kg take-off weight. This helicopter will feature the most spacious transport and cargo cabin in its class with a total capacity of up to 5 persons, and will be equipped with the state-of-the-art glass cockpit avionics suite. With improved performance characteristics this helicopter will be capable of accelerating up to 230 km/h and will achieve a range of up to 1000 km and payload of up to 750 kg.

# ОПК РФ

СПЕЦИАЛЬНЫЙ ИНФОРМАЦИОННО-АНАЛИТИЧЕСКИЙ ПРОЕКТ

ОБОРОННО-ПРОМЫШЛЕННЫЙ КОМПЛЕКС РФ



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## SIBER SIGNED A MEMORANDUM

SIBER Holding, Chinese DeWe Group and Far East Agency for investment attraction and export support, which is an autonomous non-profit organization, signed a memorandum on the construction of a shooting and training center in Vladivostok. They plan to develop the facility to become a tourist cluster in future.

The center will use small weapons produced by the manufacturers affiliated to Rostec State Corporation like Kalashnikov Concern, High-Precision Complexes Science-cum-Production Association and Tula Arms Plant. A cluster to come into being on the basis of the center will cater for tourists, in particular, from China, who will be able to practice at the fire range and take part in paramilitary events of technical character. As the SIBER press service informed, the newly created shooting center will be an important supplement to the Primorskoye Koltso (Primorye Ring) entertainment and sports cluster, which is going to be built in the near future.

Under the signed memorandum terms, SIBER will provide consulting and security services within the framework of the project, as well as assistance in obtaining the required permits and licenses. In addition, the Russian holding company will make available firing proficiency programs. The Far East Agency for attracting investment and export support will promote the project on the territory of the Free Port of Vladivostok and public relations service to attract Chinese tourists. Chinese partners will become the main investor in the high-tech shooting complex. They will be responsible for its shaping project designing.

## 'AGAT – CONTROL SYSTEMS'

At exhibition TIBO-2018 Belorussian 'AGAT – control systems' introduced its latest products dedicated to information security, navigation, air traffic management as well as LTE-based solutions at a joint exhibition stand 'Geo information control systems'. The visitors were shown LTE-based 'Mobile aide' dedicated to control rooms of electrical network regions and sites. Among the major topics of the exhibit was the demonstration of call emergency service device which can automatically define traffic accident and transfer data to ERA-RB system operator via GSM channels. IT security-dedicated developments included software 'Cross-platform file integrity monitoring system' and one of the latest products cryptographic information security equipment 'PRIMA'.

## KAMAZ Revenue

*KAMAZ prepared financial results for the last year under IFRS. Consolidated proceeds of PJSC KAMAZ exceeded RUB 156 billion, and net profit amounted to about RUB 3.5 billion in 2017. Almost 40,000 trucks were sold in total.*

Trucks sold on local and foreign markets totaled 38,192 items which is 11% more than in 2016. According to the company, factors that enabled such sales increase included 'outperforming growth rates of new lineup cars sales, effective use of client financing leverage, and pricing flexibility.'

During the accounting period, the company implemented measures to reduce costs, improve labor efficiency, and substitute imported car components. The KAMAZ share on the Russian market of over 14 ton GVW trucks amounted to 45% according to the last year results.

Company's net profit increased up to nearly RUB 3.5 billion. As a comparison, this indicator was at the level of RUB 656 million in 2016. In 2017, EBITDA was almost RUB 10.8



billion, while EBITDA margin increased up to 6.8% versus 4.6% a year earlier. An increase in revenues and effective cost management provided positive operating cash flow amounting to almost RUB 8.8 billion as compared to RUB 5.85 billion in 2016.

During the previous year, the company continued implementing production reengineering and new lineup development programs. According to the company's press service, this resulted in RUB 14.3 billion spent for upgrading and assimilation of new technologies.

## Smart Doorphone

*The Smart Doorphone system designed by Rostec undergoes final tests for integration with Moscow emergency response services, municipal and management companies, Russian Post and security companies. First smart doorphones may appear in Moscow as early as at the end of the year.*

The Smart Doorphone under the working title 'Gorod 77' (City 77) is equipped with a 4.5' color display and a large-format IP FullHD camera with a face recognition option to enable automatic door opening without a key when a dweller approaches the entrance as well as to track unauthorized visits. Moreover, dwellers will be able to open their doors with cell phones via G-Open (Apple Pay equivalent). IDTouch, a fingerprint recognition technology, can be used as an additional identification tool before opening the lock.

A door phone connected to the Internet is integrated in a common network with security and fire alarm so that the device can automatically inform the emergency contact center of a possible fire and warn the residents of a danger.



Due to doorphone synchronization with iOS and Android mobile apps, dwellers will be able to access the data anywhere in the world: to receive video calls from the doorphone on their cell phones, open entrance doors from cell phones, watch doorphone camera webcasts at any time. The application will inform dwellers of any mails, scheduled housing and utilities announcements or new elec-

tronic utility bills for a day/month or previous periods.

The Smart Doorphone will take care of children safety too: parents will receive push notifications to their cell phones when their child leaves the house or yard territory. The system will also protect dwellers' personal vehicles: it will warn the owners immediately in case of a car theft attempt.

[www.adex.az](http://www.adex.az)



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3rd Azerbaijan International

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### 'ROKOT DELIVERED A EUROPEAN SATELLITE

European satellite Sentinel-3B used to perform global environmental monitoring Copernicus has been successfully delivered with Russian space rocket 'Rokot'. It was launched from Plesetsk space port in Arkhangelsk region. The launch was facilitated by Khrunichev state space research and production center and Russian Aerospace Forces. The launch was carried out as planned. Approximately after an hour and a half the space ship reached the assigned sun-synchronous orbit.

The launch contract was concluded by ESA and Eurockot, a joint enterprise of ArianeGroup and Khrunichev center which has an exclusive right to commercially employ launch vehicle 'Rokot'. Copernicus previously known as CMES (Global Monitoring for Environment and Security programme) is implemented under auspices of European Commission in cooperation with ESA and European Environmental Agency. Sentinel-3B, made under Copernicus program by French unit Thales Alenia Space under the order of European Space Agency, is to provide monitoring data as to oceans, sea ice and off-shore areas.

Intercontinental ballistic missile RS-18-based light launch vehicle 'Rokot' was made by Khrunichev center to put space vehicles with weight up to 1.95 tons to near-Earth orbits under Federal space program and commercial programs. 'Rokot' capabilities fully meet requirements of putting small and medium space vehicles to sun-synchronous and near-pole orbits. Thanks to upper stage 'Briz-KM', 'Rokot' can implement various kinds of delivering payload such as putting several space ships in a single or several orbits.

'Rokot' has been employed commercially since 2000 and used under federal programs since 2005. The total number of launches performed from Plesetsk space port (from 2000 till now) is 28 7 of which were done with a hosted payload. Over the previous 17 years 'Rokot' has put into orbit over 60 different space ships.

Sentinel-3B is a third Sentinel satellite carried with 'Rokot' under the contracts concluded between ESA and Eurockot. Since 2000 Eurockot has been providing 'Rokot' launch service and ensuring commercial launches of small space ships to low orbits. Many of the launches involve space ships to monitor Earth, carry out research and practice new technologies in space. Under contracts concluded by Eurockot and ESA 'Rokot' has successfully put into orbit six earth global monitoring satellites (GOCE, SMOS, SWARM, Sentinel 3A, Sentinel 5P, Sentinel-3b) as well as technological demonstrator PROBA-2. The launch executed has become a 14th in turn for Eurockot.

### Russian Equipment for Special Units

*Rosoboronexport, Rostec's member, set up a joint Russian exposition at the International Special Operations Forces Exhibition SOFEX-2018 that took place on May 8-10, 2018 in Jordan's capital Amman.*

'SOFEX is a serious platform presenting abundant opportunities to meet partners from Jordan and other Mideastern and North African states. I have no doubt that Russia's exposition stirred interest in everyone. Naturally, the visitors were able to learn lots of useful facts about most demanded on the world market weapons labeled 'Made in Russia.' They included 100-plus pieces of military equipment deployed in special operations units of Russia's Ministry of Defense, Ministry of Interior and Federal Security Service boasting considerable experience in fighting terrorism, drug trafficking, and organized crime,' said Director General of Rosoboronexport Alexander Mikheev.

Being one of the largest exhibitions of gear and systems for special operations forces in the Middle East and North Africa, SOFEX has been conducted since 1996. Russia started coming to the event in 1998. Hosted by Marka RAF base of Jordan, SOFEX is conducted under auspices of King Abdullah II of Jordan and His Royal Highness, LtGen, Prince Faisal Bin Al Hussein. The exhibition is focused on various aspects of special operations forces deployment, including training, transportation, fire and comprehensive support.

Russia's booths housed Tigr- and Tayphoon-K-family vehicles, BTR-80/80A/82A personnel carriers,

A-220M 57mm light artillery system, Kornet-E and Kornet-EM AT missile systems, night sights and vision devices, compact radars, RPO PDM-A Shmel-M rocket-assisted enhanced-range infantry flame thrower, 2B24 82mm mortar, MGK Bur small grenade launcher, various grenade systems and small arms from pistols to sniper rifles and to Kalashnikov's latest assault rifles, as well as man-portable AD systems Igla-S and Verba, Strlets-based super-short range SAMs for the Igla MANPADS, RShG-2 rocket-assisted assault grenade, ammunition, etc.

Another reason to visit the company's booth was to have a look at the unique characteristics of the TOS-1A heavy flame-thrower, which among other Russian systems enjoys consistently high demand on the world arms market. In the Middle East, the weapon's popularity has been on the rise recently due to its outstanding performance in large-scale anti-terrorist operations.

The gamut of Russian weapons and systems brought to Amman was accounted for by the magnitude of today's threats and challenges facing the Middle East and North Africa, let alone the heightened interest of foreign partners in them. Besides, many of them proved their outstanding characteristics in combat fighting as part of Russia's Aerospace Force contingent in Syria.



Rosoboronexport was happy to let all visitors test their shooting skills at the SKATT simulator of the 5.56mm AK-101 Kalashnikov assault rifle, 9mm Yarygin magazine pistol, and 9mm Kedr submachine gun.

Since Russia and Jordan enjoy strong and time-tested ties, its military and technical cooperation established as far back as 1981 has been progressing so far. After 2000, Jordan received IL-76MF transports and Kornet-E ATGMs. The country started production of the Russian-designed RPG-32 Nashshab (Arabic for archer) grenade launcher.

'The military and technical cooperation between Russia and Jordan have a considerable margin for future growth. Plans include meetings with military and political authorities of the host nation to discuss current and future projects in the sphere. Russian specialists will also participate in the Middle East Special Operations Commanders Conference to pave the way for the actual event the next day,' stressed Alexander Mikheev.

### License for 'Perelyet'

*IT Research Institute of 'Roselektronika' has been granted a patent for a prototype system 'Perelyet'. The facility is designed for authorities of state aviation including Defense Ministry, EMERCOM, FSB and National Guard. The system ensures quick planning, coordination and control of flights of state aviation planes and helicopters.*

The main distinct feature of 'Perelyet' is increased state aviation control efficiency. The system ensures transfer and processing data of planned and executed flights, generation of the best flight mode option. For example, the facility can control search and rescue plan

dedicated to aircraft flights by automatically adjusting data as to involved facilities of armed forces and Transport Ministry of Russia. Besides, the system uses secure information exchange channels. Automated control system 'Perelyet' may be integrated in automation

facilities deployed at military aviation and special agencies command units. The system can automatically perform engineering and navigation calculations and make suggestions as to air transport opportunities taking into account aircraft type, cargo carried and fuel option.

## HIGH-PRECISION WEAPONS IN RUSSIA AND IN THE WORLD

# ВЫСОКОТОЧНОЕ ОРУЖИЕ в России и в мире

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"United Industrial Edition" preparing to publish a new quarterly international research project dedicated to the development, creation, production, delivery, maintenance and use in the armed forces of various types of precision weapons. The publication of the bilingual (Russian and English), addressed to professionals, creators and operators of high-precision weapons. Distribution is by subscription.

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### SHOOTING AND TRAINING CENTER IN VLADIVOSTOK

SIBER Holding, Chinese DeWe Group and Far East Agency for investment attraction and export support, which is an autonomous non-profit organization, signed a memorandum on the construction of a shooting and training center in Vladivostok. They plan to develop the facility to become a tourist cluster in future. The center will use small weapons produced by the manufacturers affiliated to Rostec State Corporation like Kalashnikov Concern, High-Precision Complexes Science-cum-Production Association and Tula Arms Plant. A cluster to come into being on the basis of the center will cater for tourists, in particular, from China, who will be able to practice at the fire range and take part in paramilitary events of technical character. As the SIBER press service informed, the newly created shooting center will be an important supplement to the Primorskye Koltso (Primorye Ring) entertainment and sports cluster, which is going to be built in the near future.

### FOR A PROSPECTIVE AIRCRAFT

Holding Technodinamika has developed high-speed synchronous generators GSR-90/120 prototypes for a prospective aircraft with a hire electric power consumption feature. 'The serial production of generators like GSR-90/120 will significantly contribute to the reduction of the Russian aircraft industry dependence on foreign components,' said Igor Nasenkov, Technodinamika General Manager. 'In the long run, such power plants may be installed on a wide range of aircraft, from MC-21 and wide-body long-haul liners in civil aviation to transport aircraft.' Currently, Technodinamika is completing the GSR-90/120 prototypes preparation for full-scale testing, including functional, mechanical and thermal tests. A distinctive feature of the generator is the possibility of its use on board an aircraft without a constant speed drive in a range from 10800 to 24000 rpm.

### THE CONFIGURATION OF HELICOPTER

The Indian party has approved the configuration of Ka-226T light-weight multi-purpose helicopter designed by Russian Helicopters (a member of the Rostec State Corporation). The helicopter is expected to be assembled by a joint enterprise Indo-Russian Helicopters Limited in India. As noted by Andrey Boginsky, General Director of Russian Helicopters, approval of the helicopter's appearance means that the technical aspects of the project have already been agreed upon. 'The Indian party has declared one's readiness to issue RFP for the supply of 200 helicopters, following which we can start preparing contract documents,' he added.

## Gold and global brand BelOMA

*Products under the Belarusian brand BelOMA are very well known throughout the world, in that region and in the countries of the Middle East. The history of the Belarusian Optical and Mechanical Association (BelOMA) springs from foundation of the Minsk Mechanical Works named after S.I. Vavilov (MMW) in 1957 (the first products – cameras and the machines for optical instruments and devices processing).*

In view of expansion of production volume and nomenclature of the products being manufactured, in 1971 the Belarusian Optical and Mechanical Association has been founded on the basis of the MMW named after S.I. Vavilov. BelOMA held the leading position in the optical branch of the USSR and solved the tasks on development and production of special-purpose items and the consumer goods. The plants which were parts of the Association specialized in production of particular kinds of products:

BelOMA has been awarded with the Order of the Red Banner of Labour, 228 workers, experts and employees have been awarded with medals and orders of the USSR, 28 experts have been awarded with the ranks of the Laureates of the State Awards of BSSR and the USSR, 2 Laureates of the Lenin Awards, 3 employees have been awarded with the ranks of the Heroes of Socialist Labour.

BelOMA has also been awarded with 'Gold Globe' prize and Diploma – for the outstanding contribution to development of the national economy and integration into world economy, 'Birmingham Torch' prize and Diploma – for success in survival and development under difficult conditions, other prizes.

In 2009 the enterprises which were the parts of BelOMA have been reorganized into public corporations (Zenit-BelOMA Public Corporation, Diaprojector Rogachev Plant Public Corporation, Svet Zhlobin Factory Public Corporation).

At present, in spite of universality and multiproduct character of production, BelOMA as before is the Company famous for its specialization – production of laser, optoelectronic and optical-and-mechanical systems and devices. The Company manufactures sights, binoculars, night vision devices and many other products of special



destination. The innovation project of BelOMO Holding – production of domestic thermal imaging devices.

High quality, reliability, technological efficiency, durability and ease of exploitation were always the attributes of the products of BelOMO Holding. The products completely correspond to the national and international standards requirements. This means that also in the future BelOMO Holding can work with expansion of the assortment of the products being manufactured and their active sales promotion in the world markets.

## High-Tech Equipment for the Asia Market

*Being a State Corporation Rostec affiliate, the holding company Shvabe has concluded a trilateral agreement on cooperation in the field of promoting national high tech in the Southeast Asia market. The agreement was signed by the Shvabe holding, Singapore company Progression Pte. Ltd. and Russia-Singapore Business Council (RSBC).*

The signing of the agreement took place in the framework of the annual business forum 'Russia-Singapore Business Dialogue'. The parties agreed on cooperating and interacting with the Center for Promoting Russian high-tech companies overseas and presenting investment projects founded on the basis of Progression Pte. Ltd. State Corporation Rostec took part in the Russian-Singapore Business Dialogue forum as a general partner. The Russian delegation was headed by Nikolai Volobuev, Rostec Deputy General Manager and Alexey Gruzdev, Deputy Minister for Economic Development.

It is worth noting that Rostec-supported Russian-Singapore Business Council founded in 2017 in Singapore a Center for Promoting of Russian Technologies overseas and presenting investment projects. It was inaugurated in December 2017 during Rostec General Manager Sergei Chemezov's visit to Singapore. As of 2018, three cluster expositions with the participation of Schwabe in the Pharmaceuticals and Medicine section are to be organized on the center site. They will be accessible to the public in April, May and from August through October.



The holding delegation also took part in the plenary session of the Russian-Singapore Business Dialogue forum dedicated to the Russia – Singapore interaction in the field of innovation and digital technologies pertaining to healthcare, smart city management, investment cooperation of countries and other topics.

# Международный военно-технический форум ARMY 2018

№01, 21 августа 2018 года

ОФИЦИАЛЬНОЕ ЕЖЕДНЕВНОЕ ИЗДАНИЕ ФОРУМА

ОФИЦИАЛЬНЫЙ ПОКАЗ-ДЕНЬ ПЕРВЫЙ

## Главный форум Инновационный союз ОПК России и Вооруженных сил РФ



«С 22 по 27 августа Министерство обороны Российской Федерации проводит Международный военно-технический форум «АРМИЯ-2018». Это третье по счету масштабное мероприятие, в котором примут участие крупные отечественные и зарубежные предприятия оборонно-промышленного комплекса, ведущие конструкторские бюро и научно-исследовательские институты.

Основные мероприятия Форума пройдут в Конгрессно-выставочном центре «Патриот». Общая площадь экспозиции в павильонах и на открытых площадках превысит 300 тыс. кв. м. Динамические показы ходовых, летных и огневых возможностей вооружения, военной и специальной техники состоятся на аэродроме Кубинка, полигоне Алабино, а также в военных округах и на Северном флоте.

Научно-деловая программа пройдет в формате пленарных заседаний, конференций, круглых столов и брифингов, что позволит обсудить актуальные вопросы обороны и безопасности, дальнейшие направления совершенствования способов производства продукции военного назначения.

Тысячи посетителей смогут ознакомиться с последними достижениями в области высоких технологий и перспективными разработками, которые реализуются в военной сфере.

Сегодня Форум впервые можно увидеть изнутри, посетив выставочный центр «Патриот».

## Международный военно-технический форум ARMY INTERNATIONAL MILITARY-TECHNICAL FORUM «ARMY-2018»

International military-technical forum  
'ARMY-2018'

August 21-26, 2018

The Patriot Congress and Exhibition Centre with the Military and Patriotic Park of Recreation and Leisure of the Armed Forces of the Russian Federation

Official information analytical edition of the forum – newspaper show-daily 'ARMY-2018'  
Four issues: 'First day', 'Second day', 'Third day', 'Fourth day'

Reports on the work of the Forum, the most important current business and presentations, the representation of participants, their exposition and programs.

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**TWO SHIP-BASED KA-226T**

Kumertau Aviation Production Enterprise (KumAPE) of Russian Helicopters Holding Company (part of Rostec State Corporation) delivered another two ship-based Ka-226T rotorcraft to the customer, thus completing contract execution ahead of schedule. The helicopters successfully accomplished the entirety of acceptance tests and are to join the special-purpose state aviation fleet shortly.

The current delivery is the third in line: at the end of March 2017, KumAPE hosted a ceremonial handover of the first two ship-based Ka-226T with another two helicopters delivered in December 2017.

'The enterprise's contractual obligations have been fulfilled in advance, and four rotorcraft delivered earlier are already inducted into the special-purpose aviation. Ka-226T has demonstrated an excellent performance in challenging sea conditions. I am sure that such experience will boost the demand for this helicopter both in Russia and abroad,' highlighted Andrey Boginskiy, Director General of Russian Helicopters Holding Company.

As distinct from the 'land-based' version, light utility ship-based Ka-226T helicopter features a blade folding system of the main rotor. Moreover, the helicopter boasts the state-of-the-art avionics suite, its components and systems are fit for operation under aggressive conditions of marine environment. Owing to its small dimensions, the helicopter can be deployed on ships and low-displacement vessels. Ship-based Ka-226T helicopter is intended for performing search and rescue and transport missions round-the-clock in standard or adverse weather.

**COOPERATION AGREEMENT**

The Roscongress Foundation and Moscow State Institute of International Relations (University) under the Ministry of Foreign Affairs of the Russian Federation have concluded an agreement on cooperation. The document was signed by Roscongress Foundation CEO Alexander Stuglev and Moscow State Institute of International Relations Vice Rector Artem Malgin. The parties agreed to cooperate in order to ensure the highest-level preparation and holding of congress, exhibition, and social events in Russia and abroad, involving Moscow State Institute of International Relations. Cooperation will consist of bilateral and multilateral consultations, webinars, forums, roundtables, seminars, conferences, joint projects and initiatives, youth projects, as well as conducting practice-oriented studies on areas of joint activities.

**Tecmash in 2017**

*Tecmash Concern has summed up the results for 2017. More than 40 military-cum-technical cooperation contracts were fulfilled and a 45% increase in civilian production output was recorded during the reporting period.*

For instance, the Concern delivered all the main targets under the State Defense Order, fulfilled more than 40 military-cum-technical cooperation contracts, and decreased the number of toxic assets almost by half. Eight federal target programs and ten restructuring projects have also been completed in 2017.

The annual volume of civilian goods production went up by 45%. It was RUR 11.2 billion last year against RUR 7.7 billion in 2016. New civilian products including drilling equipment and refrigerators, have been designed and put into batch production by the holding facilities as part of the Rostec overall strategy implying a 50% increase of civilian production share by 2025.

Science-cum-production Concern Tecmash was founded by the Rostec State Corporation in 2011. The



Tecmash holding structure includes 36 enterprises of the ammunition industry. Highly effective models of military hardware manufactured by the Tecmash holding are used in more than 100 countries around the world.

The scope of the Concern affiliates civilian production encompasses the fossil and power production complex equipment, industrial and medical refrigeration equipment, agricultural machinery and consumer goods.

**Light Aircraft TVS-2DTS**

*The Rostec State Corporation launches manufacturing of TVS-2DTS light aircraft at the facilities of the Ulan-Ude Aviation Plant (U-UAZ), a member of the Russian Helicopters holding company. The aircraft will be utilised for regional passenger operations, initially – in Siberia and the Russian Far East where a new airline company will be established for these purposes.*



The agreement on local airline operations was signed during the Russian Investment Forum in Sochi by the Ministry of Industry and Trade of the Russian Federation, the Ministry of Transport of the Russian Federation, representatives of the Republic of Buryatia and the Sakha Republic (Yakutia), as well as the Russian Helicopters holding company. According to the agreement, new TVS-2DTS aircraft manufacturing facilities will be built at U-UAZ by 2019. During the period of 2021-2025, the plant agrees to supply at least 200 vehicles for regional aviation.

TVS-2DTS is a lightweight multi-purpose aircraft with an all-composite structure. It is equipped with an avionics system allowing to operate it during any time of day or night and

in any weather conditions. Another advantage of the aircraft is that it does not require any special take-off or landing site. Its cruising speed reaches 350 km/h, load-lifting capacity – 3.5 tons, and the maximum flying range is 4,500 km.

TVS-2DTS aircraft will replace the obsolete An-2 aircraft built in USSR and abroad that are still massively used by regional airline operators. The vehicle was first demonstrated by the Rostec State Corporation at the MAKS Air Show in 2017.

# РОССИЙСКО-АРМЯНСКИЙ ДЕЛОВОЙ ЖУРНАЛ

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### CERTIFICATE FOR KA-226T

Russian Federal Aviation Agency (Rosaviation) has issued a supplement to the certificate for Ka-226T helicopter that allows the machine operation at high temperatures. The document makes it possible to start exporting the helicopters to countries with the hot climate. The Rosaviation issued certificate has become a result of testing, carried out by Russian Helicopters specialists and Iran Helicopter Support and Renewal Company technicians in Iran in September 2017. The testing was done in order to prove normal functioning of the machine at outdoor temperature of up to 50 °C. 'The potential users of our helicopter had a chance to learn about its capabilities at a news conference we had upon completion of the testing in Iran last fall. Naturally, the official approval will help us negotiate with companies interested to purchase the machine', Russian Helicopters Holding Director General Andrey Boginsky acknowledged.

### KRONSTADT GROUP AT DSA & NATSEC ASIA



Kronstadt Group presented its Unmanned Aircraft Systems in Kuala Lumpur at Defence Services Asia 2018.

Kronstadt Group in delegation under the auspices of JSC 'Rosoboronexport' at DSA & NATSEC ASIA 2018 which was taking place on April 16 to 19. Defence and Security Ministries' officials and industry professionals got acquainted with Russia's latest developments in UAV technology during the first overseas appearance of Orion-E Medium-Altitude Long-Endurance Unmanned Surveillance Aircraft System. DSA is the top Defence and National Security event for South-East Asia and ranked among top-5 global defence exhibitions, providing an excellent platform to share latest ideas, products and technologies for army, navy and airforce from around the world.

'Being part of Russia's official delegation chaired by Rosoboronexport is both an honor and an excellent opportunity to present our defence solutions to the Asia Pacific region,' stated Kirill Dybko, Executive Vice-President of Kronstadt Group. 'We are happy to witness a growing interest in our latest UAV solutions on behalf of regional clients.'

### Russian 'Viking'

*JSC Rosoboronexport (part of the Rostec State Corporation) is starting the promotion to the foreign markets of the newest air defence missile system (ADMS) 'Viking' (a 'Buk-M3' type ADMS).*

'That's good news for us and our foreign partners. The 'Viking' complex preserves the best characteristics of the famous line of the 'Buk' air defence missile systems and represents the milestone in the development of the medium-range ADMS. The producers allotted unique characteristics to it, which are in line with the current requirements in the area of force and infrastructure protection from the strikes of present-day and future air assault weapons in conditions of radio-electronic countermeasures and firing. The 'Viking' has no countertypes today in the world armaments market,' said Rosoboronexport's Deputy Director General Sergey Ladygin.

The multimissile highly mobile medium-range air defence missile system 'Viking' is the next step in the development of the famous 'Kub' – 'Buk' ADMS line. In comparison with the 'Buk-M2E' ADMS, its range of fire has increased nearly by 1.5 times – up to 65 kilometers. Besides, the number of simultaneously fired targets has also increased by 1.5 times, which is 6 by each self-propelled

launching installation, and the number of ready-for-launch air defence guided missiles in one firing position made of two combat units has grown up from 8 to 18.

ADMS 'Viking' has received a number of unique features, which were not previously available in any air defence missile system. For instance, it has a capability of integrating launchers from the 'Antei-2500' ADMS, which provides for the capability of target engagement at a distance up to 130 kilometers and will boost the efficiency of the whole AD grouping in the fight against enemy's pilot-controlled aviation.

The 'Viking' was developed and designed with the account of the world market trends. Its technical characteristics allow the system to be adapted to the greatest possible extent for the priorities of Rosoboronexport's foreign customers. The combat control station of the 'Viking' has a possibility of integration with the organic radar system as well as with other radars, including the ones produced outside Russia, but possessing required character-



istics. Besides, the ADMS envisages a capability of the autonomous use of the firing sections and even separate self-propelled firing installations, which enlarges the total defended area and increases the number of covered sites. In addition, it helps to minimize the expenses for the air defence configuration set up.

'Commissioned by the Russian Armed Forces 'Buk-M3' system and its export version 'Viking' have proved a very high level of combat efficiency during their daily operation and exercises. The 'Viking' has a very high kill probability in relation to enemy's aviation, attacking elements of precision-guided munitions, as well as tactical ballistic missiles, maritime and ground targets,' added Sergey Ladygin.

### Next Generation Helicopter Engine

*United Engine-building Corporation, a part of the Rostec State Corporation, has started works on development of a prospective helicopter engine of the next generation. New construction materials and additive technologies, as well as 3D-printing, will be used in the process of development.*

In addition to proven effective technologies and materials, new design visions and aviation engines production methods will be implemented in the process of development. The contractor of the project Saint-Petersburg 'ODK 'Klimov' is planning to implement the technologies that were already used for other ODK aircraft engine models, such as PD-14 engine for civil aircraft MC-21, a prospective engine for Su-57 fighter of the fifth generation and BK-2500M helicopter engine. New construction materials and additive technologies, as well

as 3D-printing, will be used in the process of development.

'While developing new products and technologies, the Rostec State Corporation has a unique chance to use the resources of not a single company or research center but employ the united effort of all companies that are parts of the corporation to contribute to the process of development of brand new equipment for aviation industry,' Aviation Cluster Industrial Director of the Rostec State Corporation commented.

The sample engine is expected to be complete in 2021 while the



power unit is supposed to be ready for serial production in 2025. The weight of the unit will be reduced by 15 per cent compared to existing competitive models while its operation costs will be 30 per cent lower.



## MUTUAL INTEREST

*Ministry of industry and economic development of Ryazan region hosted a meeting of Ryazan and Vladimir defense enterprises representatives. The participants discussed priority cooperation areas such as personnel training, joint civil production and research developments.*

The minister of industry and economic development of Ryazan region Svetlana Goryachkina said that the regions were linked not only with geographical vicinity but also with many Rostec-owned enterprises.

An offer to establish a closer cooperation between the regions as to defense enterprises production was made in the end of 2017. The meeting was attended by the largest Ryazan enterprises such as JSC 'NII 'Plazma' (Gas-discharge equipment research institute), JSC 'Globus' (Ryazan Design Office), JSC 'Ryazan State instrumental plant', JSC 'Ryazan Radiozavod' (Radio

plant), JSC 'RPTP 'Granit'. Many of them have already contacts with Vladimir companies Kovrov state technology academy named after V.A.Degtyarev, JSC 'Kovrov electromechanical plant', JSC 'Degtyarev plant', JSC 'MIKRON' (research and technology institute), JSC 'VNII 'Signal'.

The Vladimir enterprises representatives made presentations about their priority activities followed by the host taking floor. JSC 'Ryazan Radiozavod' was presented by sales department executive manager Dmitry Nechushkin. He said that the plant had been involved in efficient coopera-

tion with Vladimir region enterprises for a long time. Thus in the context of state defense procurement it delivers radio stations and auxiliary equipment for JSC 'VNII 'Signal' and JSC 'Degtyarev plant' to complete finished facilities produced by these companies.

Mr. Nechushkin would like to establish a closer cooperation with JSC 'VNII 'Signal' during trials and design activities. 'I am sure we have something to offer our Vladimir partners. We have many areas for cooperation and productive work dedicated to both parts,' he emphasized.

## RESEARCH AND EDUCATION CENTER

*JSC 'Concern 'Sozvezdie' together with Voronezh State Engineering University has opened basic research and education center 'Radio engineering systems' to integrate education, science and production which is among the key conditions for innovative development of Russian economy. The center has been created to train highly qualified experts and carry out joint research activities.*

'Radio engineering systems' center is a structural unit of the university being a part of radio engineering and electronics department. It is headed by the chief of research and technology department of 'Sozvezdie' Nikolay Tikhomirov. 'The priority task of the center is training personnel for 'intellectual special forces of Russia', those who will be able to become the elite designers of the enterprise, create up-to-date and sophisticated radio engineering facilities and systems as well as produce globally competitive products. Since personnel are

very important we should grow up specialists who have knowledge to meet world standards. That is why the center instructors are not tutors but first of all students' co-workers, assistants, like-minded persons and companions,' Nikolay Tikhomirov said.

The center is involved in dedicated training of 'Radio electronic systems and facilities' specialists; radio engineering and electronics design and technologies masters. The training period is two years. The lessons involve not only the university teachers but also production specialists of the enterprise. It is

important that among the center tasks are professional skills to be acquired by students, enhancing of knowledge gained during theoretical training. Another factor dedicated to practical orientation of training process is carrying out joint researches and introduction of research results in production.

It should be stated that Voronezh State Engineering University has been a strategic partner of 'Sozvezdie' with regard to engineering personnel training for many years. Over 55% research and engineering personnel are graduates of the center.





# INNOVATIONS AT KADEX-2018

## *Rosoboronexport Shows Modern Russian Weapons and Desitions*

Rosoboronexport, Rostec's member, presents Russian exposition at the KADEX-2018. The gamut of Russian weapons and systems brought to Astana is accounted for by the magnitude of today's threats and challenges facing the countries of the CSTO (Collective Security Treaty Organization), let alone the heightened interest of foreign partners in them. Besides, many of them proved their outstanding characteristics in combat fighting as part of Russia's Aerospace Force contingent in Syria.

**B**eing one of the largest exhibitions in the CSTO, KADEX-2018 makes it possible to see the best Russian defense developments. It is important to remember that only Rosoboronexport has the right to supply the world market with a full range of arms and military equipment manufactured by Russia's defense industrial complex and approved to be exported. Rosoboronexport accounts for more

than 85% of Russia's arms exports. Rosoboronexport is among the major operators in the world market for arms and military equipment. This year JSC Rosoboronexport will mark its 18th anniversary.

Rosoboronexport was set up by RF President's Decree as a federal state unitary enterprise tasked to implement the national policy in the area of military-technical cooperation between Russia and foreign countries. Since 1 July 2011 Rosoboronexport

has been operating as an open joint stock company. Rosoboronexport operates under the strict supervision of the Russian President, the Russian Government and in full conformity with the UN arms control treaties and the relevant international agreements. Director General of Rosoboronexport – Alexander Mikheev.

The official status of the exclusive state intermediary agency gives Rosoboronexport unique opportunities to expand long-term



**Alexander Mikheev,  
Director General of Rosoboronexport**  
*'We consider participation in international defense exhibitions as one of the key areas of the Company's marketing activities. In 2018, our delegations will visit 23 events in various regions of the world. Particular attention will be paid to the most promising markets such as the Asia Pacific region, the Middle East and Latin America.*

*Clearly, the exhibitions held in Russia continue to be priority and probably most productive for us. This year,*

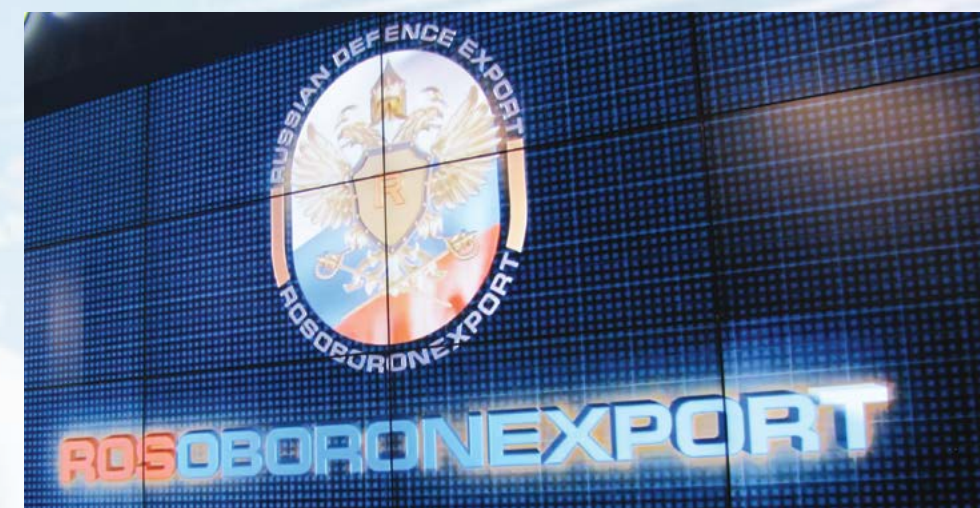
*Rosoboronexport traditionally organizes its displays at the Army Forum, International Helicopter Industry Exhibition (HeliRussia 2018), Interpolitex and will exhibit its promoted products at the International Far East Naval Salon 2018 in Vladivostok for the first time.*

*To strengthen our military-technical cooperation with the Philippines that received a major boost in 2017, we will for the first time organize a Russian display at the Asian Defense & Security (ADAS) 2018 Exhibition and Conference, to be held in September in Manila. I am confident that our participation will strengthen Russia's position on the highly competitive Asian and Pacific arms market.'*

mutually beneficial cooperation with foreign partners, provide guaranteed state support of all export-import operations, and strengthen Russia's leadership in the world arms market.

The main result of biography of Rosoboronexport, despite the difficult economic conditions and fierce, often unfair, competition in the global arms market, that company have managed not only to carry its sales, but also significantly enlarge its footprint in the traditional and new arms markets. Through integrated marketing strategies, company have ensured that order book today exceeds US\$ 46 billion.

The special exporter makes painstaking efforts on a daily basis to increase Russian arms exports resulting in more than a thousand contract documents signed with foreign customers every year. Over the period of its operation in the international market, Rosoboronexport has delivered hundreds of thousands of units of military equipment and weapons worth more than US\$ 120 billion to 115 countries.



***Rosoboronexport pursues a marketing strategy targeted to expand the geography, range and volume of export deliveries. A number of special programs and projects for exporting products to specific countries have been developed based on a comprehensive analysis of the arms markets and foreign partners' needs. Rosoboronexport seeks to operate flexibly and efficiently in the market, using modern and advanced marketing and customers' settlement methods.***





Rosoboronexport pays great attention to both major billion dollar contracts and small deals. The company seeks to operate flexibly and efficiently by using modern and advanced marketing and customer settlement methods. The special exporter cooperates with more than 700 Russian defense-industrial enterprises and organizations, which enables it to offer partner countries the comprehensive and cost-effective solutions for strengthening their defense capability and national security.

By concluding export contracts, Rosoboronexport supports the Russian defense industry, which is especially important under difficult conditions in the global market. High-tech products are in increased

demand in the world arms market today and thus the company is interested in developing smart manufacturing in Russia. In addition, Rosoboronexport is actively involved in a number of charitable and sponsorship projects. The company provides assistance to military hospitals, military historical museums, and children's educational institutions. Rosoboronexport supports major sporting events and various sports federations, acts as sponsor and partner of the largest industrial exhibitions and cultural events held in Russia and abroad.

Rosoboronexport pursues a marketing strategy targeted to expand

the geography, range and volume of export deliveries. A number of special programs and projects for exporting products to specific countries have been developed based on a comprehensive analysis of the arms markets and foreign partners' needs. Rosoboronexport seeks to operate flexibly and efficiently in the market, using modern and advanced marketing and customers' settlement methods.

Foreign customers are offered package solutions for national systems intended to defend land, air and seaside borders, which feature the optimal trade-off between cost and performance. These solutions may



include both the supply of military products and services and organization of licensed production in customer countries, the setting-up of joint ventures to manufacture and maintain equipment, as well as joint R&D efforts. Rosoboronexport widely uses the optimal offset programs. With regard to foreign customers' interests and the opportunities of the Russian defense industrial complex to increase its exports, Rosoboronexport pays much attention both to major billion-dollar contracts and small deals worth the hundreds of thousands to several millions of dollars.

/IA&MG/

The first Soviet state intermediary agency for military-technical cooperation with foreign countries was created on 8th May 1953 after the USSR Council of Ministers had decided on forming the General Engineering Department within the then Ministry of Domestic and Foreign Trade. Other special foreign trade bodies were created later on to provide for further expansion of military-technical cooperation activities. In the late 1990s there were two federal state unitary enterprises in Russia acting as state arms exporters Rosvoorouzhnie State Corporation and Promexport.

In November 2000 the two enterprises were merged into a single one –Rosoboronexport Federal State Unitary Enterprise, the sole state intermediary for export/import of defence products, by the Presidential Decree No. 1834 dated 4th November 2000 aimed at restructuring the system of military and technical cooperation of the Russian Federation with foreign states, and improving its performance. Since September the 1st, 2014 Rosoboronexport has been operating as a joint stock company.

Core areas of activities of Rosoboronexport

- Export / import of all types of conventional weapons, military and dual-use equipment and services.

- Organization of licensed production of armaments and military equipment abroad, joint R&D efforts with foreign partners.
- Maintenance and repair of earlier supplied weaponry and military equipment.
- Modernization of Russian-made weapons and military equipment.
- Training foreign specialists in Russia and customer countries in the operation and maintenance of supplied military equipment.
- Technical assistance in the construction of military infrastructure facilities: defense plants, airfields, depots, ranges, training centers.

Rosoboronexport is the only state-owned arms trade company in the Russian Federation authorized to export the full range of military and dual-purpose products, technologies and services. It is a subsidiary of the Rostec Corporation. Founded on 4 November, 2000, now Rosoboronexport is one of the leading world arms exporters to the international market. Its share in Russia's military exports exceeds 85 percent. Rosoboronexport cooperates with more than 700 enterprises and organizations in the Russian defence industrial complex. Russia maintains military technical cooperation with more than 100 countries around the world.

**Only Rosoboronexport has the right to supply the world market with a full range of arms and military equipment manufactured by Russia's defense industrial complex and approved to be exported. Rosoboronexport accounts for more than 85% of Russia's arms exports. Rosoboronexport is among the major operators in the world market for arms and military equipment. This year JSC Rosoboronexport will mark its 18th anniversary.**







## Dear Ladies and Gentlemen!

**On** behalf of the Ministry of Defense and Aerospace Industry of the Republic of Kazakhstan and on my own behalf, I welcome you and I am pleased to announce the holding of the V International Exhibition Weapons Systems and Military Equipment KADEX-2018, which will be held from May 23 to 26, 2018 in Astana.

This is the first exhibition held under the auspices of the Ministry of Defense and Aerospace Industry of the Republic of Kazakhstan. It will be attended by domestic and foreign enterprises of the defense-industrial complex and space industry, leading design bureaus and research institutes.

During the years of the exhibition KADEX it rightfully became one of the world's leading exhibition platforms for demonstrating weapons, military and special equipment, technologies in the field of information security.

For the first time, the International Forum 'Space Days in Kazakhstan' will be held within the framework of the exhibition KADEX-2018, which will become one of the central dialogue platforms of the exhibition.

Within the framework of the forum, an extensive scientific and business program will be held that will take place in the format of plenary and sectional meetings, conferences, roundtables, which will allow specialists from all countries to exchange views on topical issues of defense and security, development of the world cosmonautics as well as to discuss the problems of ensuring cyber security at the present stage.

Visitors and participants of the exhibition will see the latest achievements and perspective scientific developments of the enterprises of the defense-industrial complex and the space sphere. A special emphasis on the exhibition will be made on the development of electronic systems, communication systems and weapons control, and search for modern solutions in the field of information security.

The practical result of all of this should be the conclusion of mutually beneficial contracts, the signing of agreements and memorandums, which in turn will promote the development of partnerships in the field of military-technical cooperation, cyber security and the development of outer space.

I invite everyone to participate in the V International Exhibition Weapons Systems and Military Equipment 'KADEX-2018'.

I am confident that the exhibition 'KADEX-2018' will become a large-scale event for the domestic defense industry complex and space enterprises of the country and will be held at a high level.

I wish the participants and guests of this event productive work and high achievements!

Sincerely yours,  
Beibut Atamkulov,  
Minister of Defense and Aerospace Industry of the Republic of Kazakhstan



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**23-26.05\***

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\*23,24 -ЖАБЫҚ КҮНДЕРІ/ЗАКРЫТЫЕ ДНИ

Өткізу орны - Қазақстан Республикасы Қарулы Күштерінің Авиациялық базасы, Астана қ.

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**АО «Повет»**  
Ивановский парашютный завод

АО «Повет» Ивановский парашютный завод является единственным в России предприятием полного цикла по производству и реализации парашютной техники людского назначения.

Предприятие выпускает самый широкий ассортимент парашютно-десантной техники: десантные, запасные, спортивные, аварийно-спасательные, учебно-тренировочные, тормозные посадочные системы, парашюты специального назначения.

АО «Повет» имеет полный пакет государственных лицензий на разработку и производство парашютной техники, в том числе техники двойного назначения.

Завод включен в список предприятий, имеющих стратегическое значение Департаментом авиационной промышленности Минпромторга РФ, осуществляет как серийный, так и индивидуальный выпуск парашютной техники.

Заказчиками Ивановского парашютного завода являются силовые ведомства Российской Федерации: предприятие более 70 лет является основным поставщиком Министерства Обороны (ВВС, ВДВ), МВД, ФСБ, ФСО, МЧС.

Коллектив завода - это более 600 квалифицированных специалистов и рабочих.

**SC «Polyot»**  
Ivanovo parachute works

SC Polyot Ivanovo parachute works is a unique Russian company, manufacturing practically all types of parachute systems: troop-type parachutes, reserve parachute systems, student-training parachutes, brake landing parachutes, special-purpose parachute systems, sports parachute systems.

SC "Polet" has a full package of state licenses for the development and manufacture of parachute technology, including double-purpose technologies.

Our manufacture is included in the list of enterprises of strategic importance by the Department of Aviation Industry of the Ministry of Industry and Trade of the Russian Federation, carries out both serial and individual production of parachute equipment.

The customers of the Ivanovo Parachute Works are the power departments of the Russian Federation: the enterprise has been the main supplier of the Ministry of Defense (Air Force, Airborne Forces), the Ministry of Internal Affairs, the FSB, FSO, and the Ministry for Emergency Situations for more than 70 years.

The collective of the manufactory is more than 600 qualified specialists and workers.

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# FIRE CONTROL

## Russian automated systems

For several decades VNII 'Signal', a part of the High-Precision Weapons Holding (Corporation Rostec), has been a Russian leading enterprise involved in development and production of automated fire control systems dedicated to artillery units as well as automated fire control systems dedicated to self-propelled guns and MLRS vehicles.

### 'Mashina-M' and 'Kapustnik-B'

**A**utomated fire control system 'Mashina-M' is used for automated control of operations and both Russian and foreign self-propelled artillery battalion (squadron) fire.

'Mashina-M' system includes two types of control vehicles which are command and observation vehicles 1V15-3 (1V14-3) and command and control vehicles 1V16-8 (1V13-3).

1V15-3 (1V14-3) can be used as follows:

- artillery reconnaissance command station;

- artillery battalion (squadron) command and observation post;
- forward observation post;
- battalion artillery squadron command post.

1V16-8 (1V13-3) can be used as squadron and battalion fire control stations.

Automated fire control system 'Kapustnik-B' is designed to control towed gun squadrons (battalions), mortar units and multiple launch rocket systems.

'Kapustnik-B' includes two types of vehicles which are command and observation vehicles 1V152 and command and control vehicles 1V153.

### Automated control

'Mashina-M' and 'Kapustnik-B' systems can be used as follows:

- for performing automated control of fire and maneuver of an artillery battalion consisting of up to 4 squadrons and up to 8 guns during preparation and combat;
- as a part of fire reconnaissance system with guns (vehicles) dispersed at fire positions and while performing counterfire maneuver in real-time manner;
- in case of individual command posts failure in high threat conditions.

'Mashina-M' and 'Kapustnik-B' systems can be effectively used to prepare, control operations and fire led by battalion (squadron) in automated mode including the following tasks:

- reconnaissance, registration fire, observation of combat area and scoring;
- laser illumination when guided munitions are used;
- finding position and directing guns (vehicles) scattered at fire positions;
- finding position and directing command and observation stations;
- positioning control vehicles on the move and during travel;



**The best tactical effectiveness of 'Mashina-M' and 'Kapustnik-B' systems is achieved when controlling guns (MLRS vehicles) equipped with automated fire control systems being end links of control loop. In this case a continuous automated fire control can be ensured from the moment a target is detected with command and observation station equipment and by command and control team, to the moment firing data is automatically transmitted to automated fire control system and all guns (MLRS vehicles) are simultaneously guided on targets in automated mode.**





Main characteristics and operational capabilities, 1V12-3 'Mashina-M' and 1V126 'Kapustnik-B'

	Automation level	Comprehensive automation of preparation and fire and combat activities control procedures including calculating firing data for each gun taking into account its position
1.	Fire and maneuver control: - Battalion - Squadron	up to 4 squadrons up to 8 guns
2.	Battalion (squadron) ready to fire time on the move, min	4
3.	Data calculation time for impromptu task, sec	40
4.	Flash spotting range, km: - day - night	10 2.5
5.	Range of communication, km	20
6.	Finding initial bearing grid angle of vehicle's center line with mean error, angular resolution	2.0
7.	Vehicle position mean error, m	10

- ensuring communications and data exchange via radio and wire channels equipped or not equipped with coded automatic communication between control vehicles, mobile command and observation posts, as well as communication with commanding artillery officers, operational commanders (headquarters), weapons and technical reconnaissance equipment;
- integration of reconnaissance and fire adjustment;
- control of unit's movements;
- battery deployment on the run with weapons free positioned;
- measurement of weather data at fire positions;
- measurement of cloud base altitude;
- NBC reconnaissance;
- performing command and control at mobile command stations and observation posts;
- ensuring protection against unauthorized access to information stored at data base and used at command posts.

The vehicles are fitted with modular equipment based on standard hardware.

Thanks to modular design the command posts can meet customers' requirements and all equipment and units can be easily replaced.

Tactical effectiveness of automated fire control systems

The required battalion fire timeliness is achieved with preparation period reduced 1.5-2 times as compared to available counterparts.

Thanks to modern gunnery equipment and new solution algorithms fire accuracy has been increased 25-30%.

Surprise of fire is ensured with coded (concealed) control of fire at all stages from preparation to end of mission.

Fire density has been increased 30-40% due to hardware and software used at fire control systems and guns for conducting simultaneous fire at different trajectories.

The quality of decisions made during planning and fire preparation has been increased 20 -30% thanks to support and decision making system as well 3D mapping.

New engagement modes help increase fire efficiency 15 -20%.

Thanks to new generation high precision guided projectiles kill probability is 0.98 – 0.99.

The use of modern unmanned flying vehicles (UFVs) and unmanned reconnaissance systems ensure high fidelity and timeliness of target detection. Besides, UFVs help conduct observed target fire at any distance with 1.5-2 times reduced ammo consumption.

The best tactical effectiveness of 'Mashina-M' and 'Kapustnik-B' systems is achieved when controlling guns (MLRS vehicles) equipped with automated fire control systems being end links of control loop. In this case a continuous automated fire control can be ensured from the moment a target is detected with command and observation station equipment and by command and control team, to the moment firing data is automatically transmitted

to automated fire control system and all guns (MLRS vehicles) are simultaneously guided on targets in automated mode.

Artillery small automated control systems

Modern engagements including joint operations by coalition task force require alternative approach to automated control systems being used by artillery units. There is a necessity of reducing physical parameters, increasing agility and maneuverability of command stations, decreasing range of equipment, simplifying procedures, reducing officers' training time and significant reduction of systems' cost. Besides, systems performance should ensure performing nearly every task to control artillery units. It is especially important for fire control systems dedicated to weapons nor equipped with automation facilities (mortars, towed guns and MLRS).

Research Institute 'Signal' is now engaged in developing small man-portable (vehicle-carried) fire control systems to control guns, mortars and MLRSs. Small automated fire con-

- capability of being used with wide range of communication, reconnaissance, navigation, weather and ballistic support equipment
- simplified procedure and reduced squadron-dedicated officers' training time (6-8 hours);
- short deployment time (no longer than 1-2 minutes);
- uninterrupted units control in case of any command station failure and up the chain control; significantly reduced time to prepare fire task (system response time is 10-15 sec);
- simplified maintenance and repair procedures including field environment.

/IA&MG/

Research Institute 'Signal' is now engaged in developing small man-portable (vehicle-carried) fire control systems to control guns, mortars and MLRSs. Small automated fire control systems include individual standardized packages, communication, reconnaissance, navigation, weather and ballistic support equipment.

control systems include individual standardized packages, communication, reconnaissance, navigation, weather and ballistic support equipment.

As a result of creating small portable automated fire control system tactical effectiveness of guns, mortars and MLRSs has been improved due to the following points:

- system low cost without sacrificing main tactical performance and high degree of harmonization of equipment;
- use of small systems to control any artillery unit both equipped and not equipped with automation hardware;







Mi-2 with AI-450M-B

# GREAT BRAND MOTOR SICH

*Quality and reliability is confirmed by long-term operations in more than 100 countries*

MOTOR SICH JSC is specialising in designing, manufacture and aftersale support of aircraft gas-turbine engines, industrial gas-turbine drives and gas-turbine power generating sets with these drives. Currently, the Company actively creates helicopter industry in Ukraine. Quality and reliability of our aircraft engines is confirmed by their long-term operation as part of airplanes and helicopters in more than 100 countries of the world. One of the Company's success criteria is participation in the international air shows. MOTOR SICH JSC constantly represents new engines and other products at aerospace shows in Kazakhstan, United Arab Emirates, France, Germany, Great Britain, India, China and other countries.

**T**oday, the list of our series-produced and developed engines for passenger and transport airplanes includes turboprop and propfan engines with power from 400 to 14000 h.p. The most perfect engine of this type is the D-27 turbopropfan engine. MOTOR SICH also manufactures the D-18T turbopropfan engine with high bypass ratio and thrust from 1500 to 23400 kgf for the An-124 Ruslan and An-225 Mriya, which are the biggest load-lifting transport airplanes in the world.

It is necessary to mention the D-436-148 engine for the An-148 pas-

senger aircraft. It complies with current ICAO requirements and is as good as similar foreign engines. From the middle of 2013, a 100-seat An-158 aircraft (a new version of the An-148 aircraft) is in service in the Republic of Cuba.

At present, designers of IVCHENKO-PROGRESS State Enterprise and MOTOR SICH JSC develop the D-436-148FM engine for the An-178 transport aircraft with load-carrying capacity from 16 to 18 tons. It is intended to replace the An-12 veteran transport aircraft. The D-436-148FM engine is a new version of the D-436-148 engine with the takeoff thrust increased up to



**Vyacheslav A. Boguslayev,**  
President of Motor Sich JSC

7900 kgf and the contingency power thrust of 8790 kgf due to application of more efficient engine units.

Currently, MOTOR SICH JSC is collaborating with IVCHENKO-PROGRESS State Enterprise in the development of a new generation

of the AI-28 bypass engine family of 8 to 10 tons thrust class. The family basic engine is developed based on the Company's research and development potential and advanced technologies. It will have an ultra-high bypass ratio due to application of the geared fan drive.

MOTOR SICH cooperates with IVCHENKO-PROGRESS in the development of the AI-222 family of engines and manufactures them in series. These engines may provide maximum thrust from 2500 to 3000 kgf, and up to 5000 kgf with the afterburner installed.

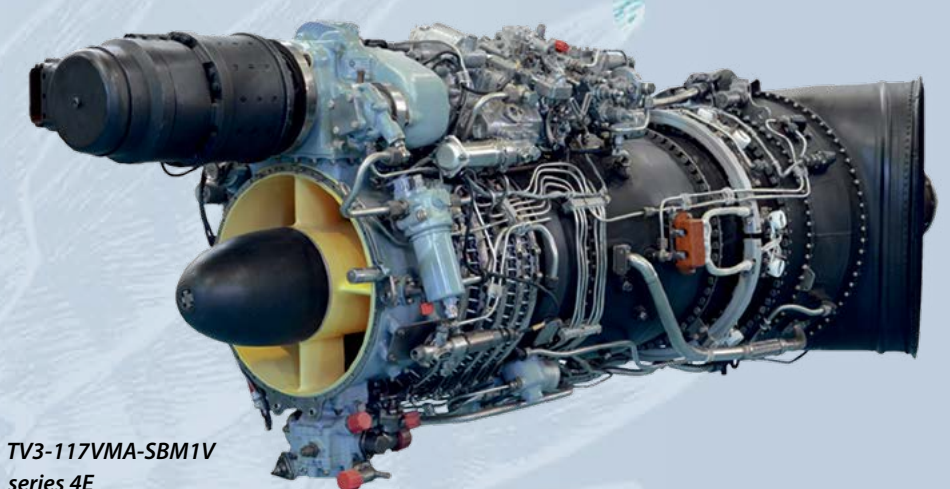
The AI-222K-25 version of the engine (without afterburner) and the AI-322F version of the engine (with afterburner) are intended for the L-15A twin-engine subsonic basic and advanced training aircraft and for the L-15B supersonic training aircraft produced by Hongdu Aviation Industrial Corporation (HAIC), China. The AI-322F engine was the first afterburning engine which was designed and manufactured in Ukraine.

MOTOR SICH JSC is one of world leaders in production of helicopter engines. In the course of years, the Company has produced more than 30 thousand of the TV3-117/TV3-117V engines. And they are constantly upgraded.

To improve helicopter performance in high-mountainous regions of countries with hot climate, MOTOR SICH JSC has developed the TV3-117VMA-SBM1V engine with the total service life of 12000 hours/12000 cycles and the first overhaul period of 5000 hours/5000 cycles.

Nowadays, Kamov Ka-32 helicopters powered by the TV3-117VMA (VMA series 02) engines are widely used for transportation of cargo on the external load sling system with multiple takeoffs during the flight cycle.

In order to increase the customer appeal and competitiveness of these helicopters, MOTOR SICH has developed the TV3-117VMA-SBM1V-02K version of the TV3-117VMA-SBM1V engine, which power specifications are adapted to this helicopter. The Company has got Type Certificate of the IAC Aviation Register and the State Aviation Administration of Ukraine for this engine.



**TV3-117VMA-SBM1V**  
series 4E

The TV3-117VMA-SBM1V series 1 version with electronic-digital ACS is developed for new rotary-wing projects. New automated control system will improve performance of engines and helicopters.

The TV3-117VMA-SBM1V series 4 and 4E engines (with air or electrical starting systems) are versions of the TV3-117VMA-SBM1V engine. They are intended for re-engining of the Mi-8T helicopters in order to improve their performance.

The TV3-117VMA-SBM1V series 3 engine was designed for the Mi-8MSB1-V helicopter (and other similar helicopters). Its power ratings and service conditions correspond to those of the basic TV3-117VMA-SBM1V engine. Its distinctive feature is electrical starting system instead of air starting system. In December 2017, MOTOR SICH JSC has got Main Change Approval of the IAC Aviation Register No. CT267-AMД/ОГН-15 for the TV3-117VMA-SBM1V series 3 propulsion engine.

The TV3-117VMA-SBM1V series 5 engine is a new project. This

engine is developed in cooperation with IVCHENKO-PROGRESS SE. The engine has takeoff power of 2800 h.p. and 2.5-minute OEI power of 3200 h.p. It has higher power due to the changed design.

MOTOR SICH is working on development, manufacture, and overhaul of helicopter gearboxes. The company has mastered overhaul of the VR-8A, VR-14, and VR-24 main gearboxes for helicopters of the Mi-8, Mi-17 and Mi-24 family.

MOTOR SICH and IVCHENKO-PROGRESS SE are developing the VR-17MS main gearbox, which is a new version of the VR-14 gearbox for the Mi-17 helicopters with take-off weight increased up to 14 tons.

In 2017, there was successfully extended application range of the AI-9V APU. Starting altitude was increased from 4550 m up to 6500 m.

In order to improve performance of the APU, IVCHENKO-PROGRESS SE and MOTOR SICH have created new versions of this engine. One of them is the AI-9V series 1 APU. This version features the following modes: air

**MOTOR SICH JSC is one of world leaders in production of helicopter engines. In the course of years, the Company has produced more than 30 thousand of the TV3-117/TV3-117V engines. And they are constantly upgraded. To improve helicopter performance in high-mountainous regions of countries with hot climate, MOTOR SICH JSC has developed the TV3-117VMA-SBM1V engine with the total service life of 12000 hours/12000 cycles and the first overhaul period of 5000 hours/5000 cycles.**



***At present, MOTOR SICH is intensely developing its own Helicopter Program. MOTOR SICH helicopter production facilities include modern machining and assembly workshops, paint removal and application section, Flight-Test Complex, Simulator Complex for training of flight crews in all types of helicopters produced by the Company.***

bleed for the cabin conditioning system, simultaneous air bleed and up to 3 kW power offtake, 3 to 4.5 kW generator mode. This APU also features extended continuous operation time.

The other versions of the AI-9V family are the AI-9V-1 APU (with STG-9M starter-generator) and the AI-9V-1T APU (with THALES starter-generator). They have an improved performance and wider operating range than the basic AI-9V APU. In particular, they have the following advantages: increased critical altitude, improved power efficiency, extended power settings.

Nowadays, small aircraft are very popular throughout the world, that is why MOTOR SICH and IVCHENKO-PROGRESS actively develop small-size turboshaft and turboprop engines of the AI-450 family.

On April 15, 2015, the AI-450M version of the engine with take-off power of 400 h.p., 430 h.p. or 465 h.p. depending on the ACS settings has successfully passed life and certification tests. The Company has got Type Certificate of the IAC Aviation Register for this engine.

MOTOR SICH is developing the MS-500V turboshaft engines of new generation. These engines will have take-off power from 600 to 1100 h.p. They are intended for different helicop-

ters with take-off weight from 3.5 to 6 tons. The MS-500V engine with take-off power of 630 h.p. and the MS-500V-01 engine with take-off power of 810 h.p. have passed tests, and the Company has got Type Certificates of the IAC Aviation Register for these engines.

The Company is also developing turboprop versions of the MS-500V-S family with take-off power from 950 to 1050 h.p. These engines are intended for general purpose, trainer and passenger aircraft.

At present, MOTOR SICH is intensely developing its own Helicopter Program. MOTOR SICH helicopter production facilities include modern machining and assembly workshops, paint removal and application section, Flight-Test Complex, Simulator Complex for training of flight crews in all types of helicopters produced by the Company.

Flight-Test Complex has a multi-purpose test bench intended for optimization and ground testing of airframe components and helicopter systems.

The Mi-8MSB medium multipurpose helicopter with maximum take-off weight of 12,500 kg is the first implemented project under MOTOR SICH Helicopter Program. The helicopter is equipped with a powerplant consisting of two TV3-117VMA-SBM1V Series 4E gas-turbine engines with electrical starting.

The Mi-8MSB helicopter powered by the TV3-117VMA-SBM1V series 4E engines has set several world records. Among them is an absolute record of level flight altitude in E1 class – 9150 metres, that is 300 m higher than Mount Everest.

The Mi-8MSB helicopter is distinguished from similar helicopters by simplicity of maintenance, repairability and reliability. The helicopter design makes it possible to install a wide range of specialized equipment for various missions. The helicopter is equipped with advanced navigational complex complying with EASA and ICAO requirements.

Development and manufacture of light helicopters is another line of MOTOR SICH Helicopter Program. The Mi-2 helicopter powered by the AI-450M-B engines has become the first certified light helicopter that was developed by MOTOR SICH JSC. Main design change involves replacement of obsolete GTD-350 engines with modern AI-450M-B engines developed by IVCHENKO-PROGRESS and manufactured by MOTOR SICH.

The Mi-2 multipurpose helicopter powered by the AI-450M-B engines differs from other light helicopters by a spacious passenger compartment and twin-engine powerplant. As compared with the Mi-2 helicopter, power of each engine is increased from 400 to 430 h.p.

The Mi-2 helicopter powered by the AI-450M-B engines has the following advantages as compared to the Mi-2 helicopter: fuel flow rate is reduced by 30 %; flight range without additional external tanks is increased by 40 %; service ceiling is increased from 4 to 5 km.



Mi-8MSB

The MOTOR SICH logo is at the top left, featuring a stylized 'M' and 'S' with 'MOTOR' and 'SICH' on either side, and '1907' at the bottom. Below the logo, the text 'MOTOR SICH' is written in large, bold, white letters, with 'power to fly' in smaller, red, lowercase letters underneath. To the right of the text is a large, detailed illustration of an eagle with its wings spread, perched on a branch. The background of the entire section is a dark blue gradient with a large, stylized turbine or propeller graphic in the upper left corner.

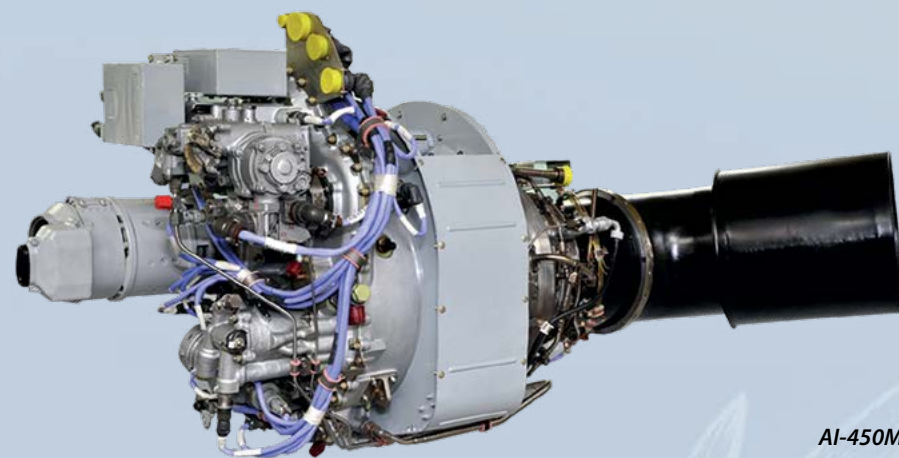
**Development, manufacturing, upgrading, overhaul and service support of:**

- Aircraft gas turbine engines;
- Helicopters;
- Industrial ground gas turbine power plants.

**MOTOR SICH – EFFICIENCY AND QUALITY EXAMINED BY THE TIME**

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AI-450M-B

**Development and manufacture of light helicopters is another line of MOTOR SICH Helicopter Program. The Mi-2 helicopter powered by the AI-450M-B engines has become the first certified light helicopter that was developed by MOTOR SICH JSC. Main design change involves replacement of obsolete GTD-350 engines with modern AI-450M-B engines developed by IVCHENKO-PROGRESS and manufactured by MOTOR SICH.**

Thanks to the changed shape of cowlings, the helicopter has received a renovated, more dynamic external view. The cowlings are made of advanced composite materials in order to reduce the structural weight. It was changed design of the structural frame, engine fuel, oil and cooling systems.

The instrument panel is supplemented with digital indicators of the engine parameters. 'Glass cockpit' onboard equipment may be installed as an option.

One of the key advantages of the upgraded helicopter is its altitude performance, which opens its way for export to the mountainous countries. On April 18, 2016, the Mi-2 helicopter powered by the AI-450M-B engines has set a new record of reaching seven thousand meter altitude.

Another advantage of the helicopter: it may be stored without hangar. Almost all similar helicopters do not have such feature.

In spite of the fact that the Mi-2 helicopter powered by the AI-450M-B engines belongs to the light helicopters, its transport capabilities are rather high. 8 passengers may seat in the helicopter cabin (excluding the pilot). Thus, seating capacity of

the Mi-2 exceeds capacity of more expensive similar foreign helicopters.

New flexible U-shaped fuel tank which configuration ensures exit of rope of the external sling system. Another advantage of new design of the external sling system is location of lock at the helicopter center of gravity. At present, new design of the external sling system is tested at our company and confirmed the possibility to increase the load-carrying capacity by 25% (from 800 to 1000 kg).

In addition to increase of the flight range due to more efficient engines, this parameter may be enhanced due to installation of external fuel tanks of higher capacity. Capacity of each external fuel tank is 300 litres.

The dual-control helicopter version may be used for training of pilots. The helicopter has one more advantage for training purposes: its design is similar to heavier helicopters of the Mi-8 type. The Mi-2 helicopter powered by the AI-450M-B engines as well as the Mi-8 helicopter has 2 gas-turbine engines and wheeled landing gear with nose landing gear.

The helicopter may also be used for treatment of agricultural fields

and may be equipped with spraying or fertilization system featuring two composite tanks having total volume of up to 1200 litres.

The Mi-2 helicopter powered by the AI-450M-B engines may be equipped with medevac equipment. Rescue variant may be equipped with the search floodlight, the winch for fast lifting of 2 persons, and other mission equipment.

The MSB-2 is a light multipurpose helicopter partially unified with the Mi-2 helicopter powered by the AI-450M-B engines. This helicopter has more powerful AI-450M-P engines (465 shp each) and new transmission based on the VR-442 main gearbox. Full-size mockup of the helicopter was demonstrated at some specialized air shows and exhibitions.

The helicopter design is optimal for passengers transportation, search-and-rescue operations and medical evacuation. As compared with the Mi-2, the MSB-2 helicopter has the following additional advantages: fuel flow rate is reduced by 30 %; cargo compartment space is expanded by 1 m<sup>3</sup>; automatic drive of the cargo-and-passenger compartment door; large area of the flight compartment windows.

At present, the first MSB-2 helicopter is assembled for ground tests at MOTOR SICH. The first prototype model is also prepared for flight tests and static tests of the helicopter airframe.

Current activity of MOTOR SICH JSC fully meets the criteria of global economy. The corporate strategy is aimed at increase of the production output, development and commercializing of new products, and expansion of the sales markets.



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## 'KB RADAR': FROM BELARUS – TO ALL OVER THE WORLD

JSC 'KB Radar' – Managing Company of the 'Radar Systems' Holding – is one of the leading research and production enterprises of the military-industrial complex of the Republic of Belarus, and one of the recognized world leaders in its segment. The products of the enterprise are well known and are used practically on all continents of the world.

**J**SC 'KB Radar' – Managing Company of 'Radar Systems' Holding, which has been set up with the purpose of joint coordinated implementation of the processes of development and commissioning of radar systems and EW assets, other military and dual-use systems in accordance with the specialization and regulations of the Managing and Participant companies of the Holding, based on the latest achievements of science and innovative technologies.

The 'Radar Systems' Holding is one of the leading organizations of the Military and Industrial Committee of the Republic of Belarus conducting the uniform policy in the sphere of defense, development of the military industries sector, cooperation of the Republic of Belarus with foreign states in military technologies.

The Holding would perform a 'turnkey' work cycle – from devel-

opment to production and follow-up of the equipment designed, training the Customer's specialists in its operation, maintenance and repairs.

The Holding joins the companies with a long-standing record, offering their specialization, unique technologies and achievements.

The company's history starting from April 6, 1974 when a special department was set up at the Science Research Institute of Automation Means (city of Minsk), is the history of selfless service of the team of scientists, specialists, all employees in the interests of the country, strengthening its defense, scientific and industrial potential.

9th March 2006 is today's company founding date. The RUE 'KB Radar', based on resolution of the Minsk City Council, was registered in the Unified State Register of Juridical Entities and Individual Entrepreneurs as Entry No 190699027.

From 30 December 2010, the company bears the legal status of an Open Joint Stock Company (JSC 'KB Radar'). Currently 100% of the shares belong to the State.

In connection with establishment of the 'Radar Systems' Holding, as from 17th October 2011 the company was re-named into JSC 'KB Radar' – Managing Company of 'Radar Systems' Holding controlled by the State Military and Industrial Committee of the Republic of Belarus.



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# 'ALMAZ – ANTEY' AIR and Space Defense Corporation will introduce several products for military and civil purposes at the Exhibition of Arms in Astana

The JSC 'Almaz – Antey' Air and Space Defense Corporation is going to show products and technological capabilities of its enterprises at the 5th International Exhibition of Weapon Systems and Military Equipment 'KADEX-2018' that will be held on May 23-26, 2018 in Astana, the capital of Kazakhstan. The integrated 'Almaz – Antey' exposition will include the products of five subsidiary enterprises of the Corporation, such as IEMZ Kupol (JSC Izhevsk Electromechanical Plant), UMZ, FNPC 'NNIIRT' and RIRT.

**T**he models, videos and presentations of long-range air defense systems S-400 'Triumf', S-300VM 'Antey-2500' and S-300PMU2 'Favorit' as well as the short and medium-range air defense missile systems 'Buk' and 'Tor' will be presented in the integrated exposition at the exhibition hall 5.

In addition, visitors will be able to learn more about multimode radar facility 55Zh6ME, mobile air surveillance radar station 55Zh6UME, mobile air surveillance 'Nebo-SVU', mobile radar 1L121E, small radar 1L122-1E and mobile radar 1L125E.

According to foreign trade deputy director Vyacheslav Dzirkaln, 'Almaz –

*In the context of Russian existing laws 'Almaz – Antey' has its autonomous right to deliver final examples of the military products under Interstate Agreements on Military and Technical Cooperation as well as to perform after-sale maintenance of previously supplied military products, deliver spare parts and components, prolong service life, repair, upgrade and dispose of the products made before.*

Antey' is going to focus on products and services that are relevant for Central Asian region during the 'KADEX-2018'.

He said that the delegates would hold some meetings during the exhibition and would negotiate with the state agencies, foreign officials and would-be customers for the products including spare parts, certification services, maintenance, repairs, upgrade and disposal of air defense facilities as well as foreign specialists training in this regard.

'At 'KADEX-2018' we expect great interest to be shown by foreign clients both in the air defense missile

systems with ground-based facilities and in the military and dual-use products that have good export opportunities thanks to their exclusive performance', V. Dzirkaln said.

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'Almaz – Antey' Air and Space Defense Corporation is one of the largest integrated enterprises of Russian defense industry with around 130 thousand personnel strength. The Corporation has been ranking 11 for the last three years according to Defense News rating of 100 largest international defense-oriented enterprises among which there are Boeing, Lockheed Martin, Raytheon, General Dynamics, Northrop Grumman, BAE Systems, Thales, EADS, IAI. The company's products are being used by more than 50 countries.



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Joint Stock Company**  
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# FAMOUS BRAND

## Peredovaya Tekstilschitsa: the best production traditions since 1875

Within the framework of the exhibition in Astana, CJSC KSF Peredovaya Tekstilschitsa – one of the leading enterprises of Russia and the world in its segment – will present its developments and products. 'Peredovaya Tekstilschitsa' was founded in 1875 and today is engaged in manufacture of technical fabrics. The enterprises arise in different ways: some grow on the basis of old plants, while the others are the new ones. Peredovaya Tekstilschitsa has its own fate and rich history, and as well as a confident technological present and future.

**F**rom a factory with the employees dependent on manufacturer, through nationalization, controversial stage of state property to leased enterprise and to joint-stock company – such is a 135 years way of development of the enterprise. One can see a date – 1875 – above the entrance to the central building, made of bricks. This is a year, when the famous company of Sapozhnikov acquired an unprofitable, unpromising and dilapidated factory in

Kurakino village. Just in two years weaving facilities were ready and equipped with new equipment for manufacture of fabrics of natural silk. It is amazing – when there was no even a definition of technical design, our ancestors instinctively obtained the perfect combination of beauty and usefulness. The factory facilities were built for a full due.

Combination of foreign architects' talent and witty mind of the Russian handworkers multiplied by the money and will of Sapozhnikovs' gen-

eration generated wonders of engineering and technology, which make us admire even today. Silk and brocade of the Sapozhnikovs' company represented our company at respected level at international and world exhibitions. Fabrics of Sapozhnikovs company are our national treasure, a phenomenon not only of industry, but also of a culture. It's no coincidence that Fedor Ivanovich Shalyapin compared the impression of silks from Sapozhnikovs with exposure to art, ennobling and elevating the soul.



And we are proud of the facts that this beauty was born in our factory.

After Russian revolution was over, the factory was nationalized and the manufacture was stopped. To kick-start production was a dream of all workers and the main task of Shelkotrest that was in charge of the factory. But nobody thought about silk or brocade of Sapozhnikovs, but about cheap cotton chintz. By the decision of the Supreme council of national economy due to lack of natural raw materials the factory launched the manufacture of semi-silk fabrics in 1922. In 1923 the factory took the first place at competition among the factories of Shelkotrest and got a name of 'Peredovaya Tekstilschitsa' (Leading Textile Worker) and carries it proudly till today. In the 30s there was a spreading Stakhanov movement across the country, which was maintained by many workers of the Peredovaya Tekstilschitsa and hereditary weaver Maria Nikolaevna Dvoryaninova was among them. In 1939 Maria Nikolaevna was awarded an Order of the Red Banner of Labor and laid foundation to glorious history of order bearers of the factory. Let's pay tribute to our veterans, whose experience and skills are honored and enriched by young employees.

As for the present of Peredovaya Tekstilschitsa it is a modern textile manufacturing enterprise equipped with home and imported equipment. Due to external factors connected with historical stages of the country development, the factory Peredovaya Tekstilschitsa totally changed its profile of manufactured

products. During the war the factory shifted to production of military products – technical fabrics for special purposes: parachute silk, military cloth, fabrics for camouflage cloaks. In the 60s, the period of rapid development of chemical industry, the factory was one of the first that began producing technical fabrics

for special purposes made of synthetic fibers and threads.

The fabrics of Peredovaya Tekstilschitsa work as thermal panels of spacecraft; meteorite traps on space stations are equipped with these fabrics and they are used for descent modules. Peredovaya Tekstilschitsa works with high strength aramid fibers that are used for production of ballistic protection means for equipment and manufacture of body protection means for military personnel of any kind of military branch, as well as for high strength and ultralight composite materials for aircraft and rocket and missile engineering, for pneumatic structures on request of Emergency Control Ministry and other high-end technologies. Another important direction is a manufacture of fabrics for different parachute systems, starting with lightweight sports models and till cargo type parachutes.

**More than 143 years is a huge period as for an enterprise of the Russian textile industry. The experience gained over the years, well established team of highly qualified specialists, well-trained employees, dynamic managers create the necessary level of technological culture that determines the priorities of development of the enterprise and allows it to take a rightful place within new Russian economy.**





***Aramid fiber of new generation 'Rusar' was developed for manufacture of fabrics for strategic missiles 'Topol-M', 'Bulava', for armor crewmen protection suits of 'Cowboy' type and military forces protection suits of 'Permyachka' type. Fluorine-containing fabrics produced by the enterprise Peredovaya Tekstilschitsa work as thermal panels of spacecraft; meteorite traps on space stations are equipped with aramid fabrics – they are used for descent modules.***



Another assortment line of business is manufacture of filter cloths. These filters from Peredovaya Tekstilschitsa are used for porcelain and faience, ore mining and smelting, aluminium as well as dairy industries.

Serious and unique nature of range of products involves high technological and professional level. 1980 was a year when the reconstruction of the weaving manufacture was finished and all manufacturing

equipment was replaced with new machines. The company constantly introduces new technologies of production of fabrics, develops a new competitive range of products, and carries out modernization of existing equipment. New weaving machines placed in commission with reference to reconstruction allowed the factory to improve significantly the working conditions.

There are relaxation rooms; the factory pays for workers visiting a pool, massage room. The enterprise has a physician, a dentist. The company pays for treatment and vacations in sanatoria and rest houses of its employees.

In order to develop commercial relationships, the joint-stock company management structure suffered considerable changes during the last years. A commercial center was established, which includes marketing service and distribution service. The company participates in different exhibitions and fairs in order to study the directions of development of textile industry and introduces its own products on home and foreign markets.

1992 has become a new landmark in a long history of the Peredovaya Tekstilschitsa – form of ownership was changed and the enterprise became a closed joint-stock company with a stock of shares belonging to corporate team. Perhaps the extra privatization was necessary – the state was unable to provide the livelihoods of entire industries, not to mention the individual enterprises. It was a hard time for Peredovaya Tekstilschitsa. But we survived, we

are working, developing, making plans for future.

The factor hindering the development of manufacture was lack of finishing production in the structure of factory. A finishing block was placed in commission under terms of challenging economic environment; new modern equipment of the leading foreign firms, which has not analogues in domestic engineering, was installed.

Thanks for considered measures of the management of the company the rate of increase in production during the first half of a year reached in volume and money terms the figures comparable with the period of the last year that allows the company to retain the qualified personnel and to have sources for development of the enterprise. Our plans are calculated for the nearest year. We've worked a lot of on it, understanding that the factory is a complex mechanism that is designed to serve to people and town.

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Today the factory produces unique products of a wide range. Technical fabrics for special purposes, produced from polyamide, polyester and aramid threads of 3.3-167 tex. Wide range of linear densities and up-to-date manufacturing equipment make it possible to produce fabrics of different linear densities and structures. Scores of different fabric styles have been developed and introduced into different national economy areas. Aramid fiber of new generation 'Rusar' was developed for manufacture of fabrics for strategic missiles 'Topol-M', 'Bulava', for armor crewmen protection suits of 'Cowboy' type and military forces protection suits of 'Permyachka' type. Fluorine-containing fabrics produced by the enterprise Peredovaya



***Fluorine-containing fabrics produced by the enterprise Peredovaya Tekstilschitsa work as thermal panels of spacecraft; meteorite traps on space stations are equipped with aramid fabrics – they are used for descent modules. Fabrics made of high strength aramid fibers are used for production of ballistic protection means for equipment and manufacture of body protection means for military personnel of any kind of military branch, as well as for high strength and ultralight composite materials for aircraft, rocket and missile engineering, for pneumatic structures on request of Emergency Control Ministry and other high-end technologies.***

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Control Ministry and other high-end technologies.

Another important direction is a manufacture of fabrics for different parachute systems, starting with lightweight sports models and till cargo type parachutes. Besides, the enterprise has developed fabrics for CU-22 and MIG-21 parachute systems. Another assortment line of business is manufacture of filter cloths. These fabrics from Peredovaya Tekstilschitsa are used for porcelain and faience, ore mining and smelting, as well as dairy industries. /IA&MG/

**The problem of protecting people from any kind of weapon is an old one and to solve this problem people went all the way from chain armor to modern universal body armor. Ballistic materials technologies are constantly developing since the 60th when the first concealable vests were produced on the basis of Nylon T-728 and that could withstand the bullets of low energy. But a really revolutionary occurrence in the field of body armor facilities was an invention of high strength fabrics on the basis of aramid fibers of new generation Rusar. High strength fabric packages are able to stop the bullets of the most pistols and revolvers produced throughout the world. The days when the manufacturers of armored clothes used the advantages of really excellent aramid fabric Rusar and produced isotropic in terms of thickness packages are irrevocably gone. Besides, an era of steel bulletproof plates is close to its end. Solution of such tasks as weight-saving and adding flexibility to armored packages and at the same time bullet and fragments resistance improvement creates a field of activity for designing new fabrics for body armors. Various fabric structures, application of threads of different number of cords, twists and application of microfilamentary fibers gives more opportunities for development of range of fabrics.**



# 'RIPR' PJSC AT KADEX-2018

At KADEX-2018 the 'Russian Institute for Power Radiobuilding' PJSC (RIPR) will present the latest products in the field of radio communications. 'Russian Institute for Power Radiobuilding' PJSC is the successor of the first Russian Research & Production Company in the field of radio engineering founded on the basis of the Kronstadt workshop of the inventor A.S. Popov in 1911 that was widely known as Komintern Research & Production Company later.

**'R'**IPR PJSC is the only company in Russia (and one of the few in the world) which has a unique experience in the development and construction of modern powerful VLF and ELF radio transmitting complexes. Our expertise and scientific innovations in this field of radio engineering are worldwide acknowledged and recognized.

The Institute belongs to GIC 'TIRA' Corporation' and is based in St. Petersburg. The corporation unites 14 departments and laboratories for development of radio transmit-

ting equipment and control systems. The Institute has a Scientific and Technical Board, Postgraduate Course and Scientific Board.

'RIPR' PJSC has an extensive experience of work at all lifecycle phases of the equipment and radio communications complexes, from research, experimental development and tests to production, maintenance, exploitation and upgrading. The company is the platform for development of software and hardware complexes and radio communications and control facilities, as well as for their system integration.

The main area of business of 'RIPR' PJSC is design and production of the

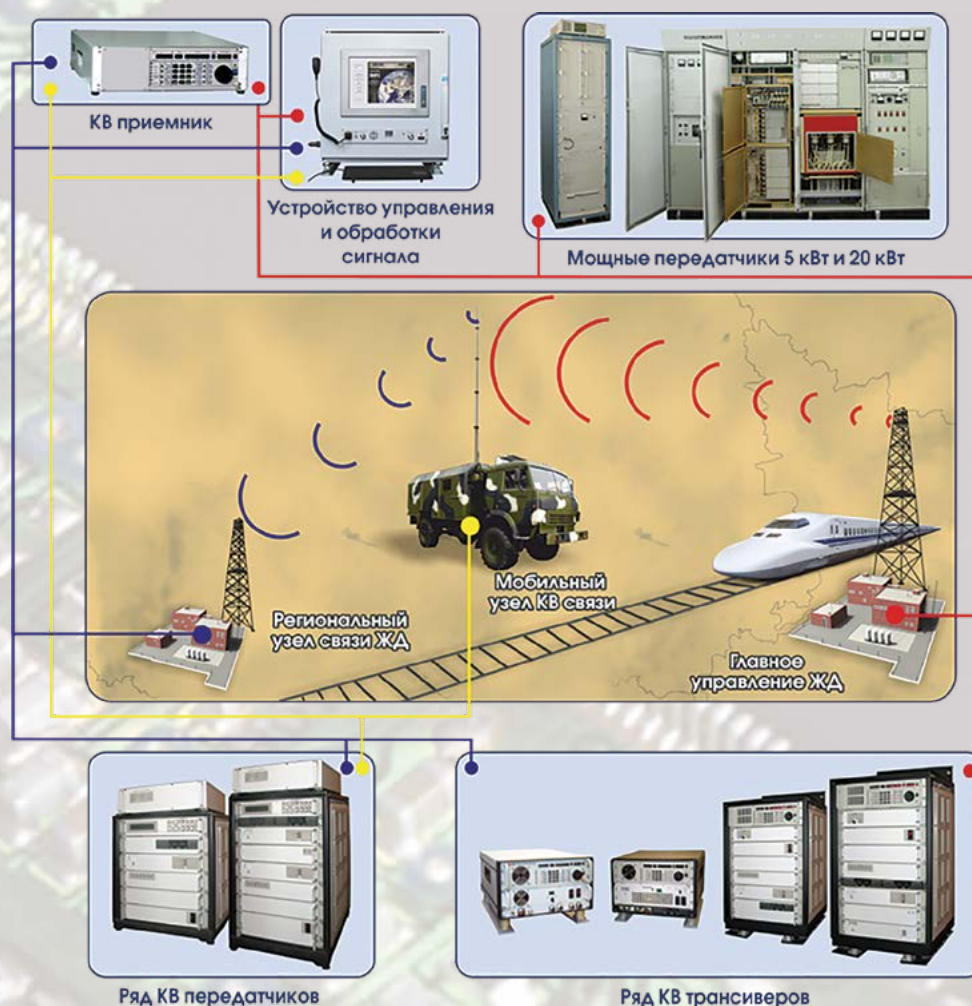
powerful LF, MF, HF radio transmitters for radio communication, radio communication for specific purposes, radio broadcasting, control complexes of various purposes and automated powerful radio stations for specific purposes. We have more than 200 types of equipments in production and more than 60 in development.

'RIPR' PJSC possesses unique testing facilities that allow to conduct full scale testing (with power up to 1 MW). Experimental modal production allows to design new samples in the shortest possible time. With the help of special testing equipment that we develop we can provide checking and testing of the radio transmitter paths in regard to the passing of the digital signal, thus all our transmitters are hybrid type transmitters – capable of analogue and digital transmitting.

Company is keeping pace with the world trends and innovations in radio communication industry. Recently we have studied and introduced a special engineering technique for transistorized radio transmitter equipment, linear and digital equipment on microprocessors, signal processor units, peak processors, programmable crystals, and fast Fourier transformation. In our equipment we also use the most advanced computing tools, software, programming languages etc. 'RIPR' PJSC have introduced new energy efficient principles in radio engineering.

Not long ago, 'RIPR' PJSC became the first Russian company to develop and commission powerful HF and VLF radio transmitting sets, solid state HF transmitters with power of 5 kW and 20 kW, the unique equipment that has been introduced in the armed forces of the Russian Federation.

/IA&amp;MG/



# ISS-RESHETNEV'S ACHIEVEMENTS ON DISPLAY IN SPACE PAVILION

Models of ISS-Reshetnev-built satellites are exhibited in the new Cosmonautics and Aviation Center which opened as part of the renovated Space Pavilion at VDNKh, Moscow.

**I**SS-Reshetnev Company's unique and long track record in designing and building satellites for a wide range of applications is presented in the Space Pavilion at Moscow-based VDNKh exhibition (Exhibition of Achievements of National Economy). The Space Pavilion, which opened its doors to visitors on April 13 after extensive restoration, includes full-scale models of Express-A, Express-AT1, Loutch-5A, Glonass-K and Geo-IK satellites.

Satellite models which ISS-Reshetnev Company built specially for the new Cosmonautics and

Aviation Center demonstrate ample opportunities that satellites and space technologies can provide to benefit social and economic development of Russia. For instance, satellites of the Express fleet (built by ISS-Reshetnev Company for the national satellite operator RSCC) make reliable satellite communications and broadcasting services available to millions of users both in Russia and other countries.

Central stage of the Space Pavilion is taken by a full-scale model of the Loutch-5A data relay satellite. Hanging high under the dome of the Cosmonautics and Aviation Center, Loutch-5A symbolizes close ties

between manned and unmanned exploration of space.

Another two models – those of a Glonass-K and Geo-IK satellites – provide visitors with an insight into achievements made by ISS-Reshetnev Company in the field of satellite navigation and geodesy.

The Cosmonautics and Aviation Center is Russia's and world's largest museum dedicated to space. Having a total area of 27700 sq. meters, it includes more than 120 exhibits, 2000 archival records, photo and video materials. The center is capable of welcoming up to 20000 visitors every day.







# DEFENSE INNOVATIONS FROM SERBIA

J.P. Jugoimport-SDPR is a state-owned company with a decades-long tradition in the trade of armaments, defense equipment and transfer of technology. J.P. Jugoimport-SDPR's core business activity from its incorporation up to this date is foreign trade in armaments and defense equipment, including both import and export of armaments and defense equipment, services in the field of overhaul and upgrade of armaments and defense equipment, personnel education and training and complex cooperation – primarily transfer of defense technologies, capital investment in the field of defense infrastructure, joint development and production etc.



**K**nown globally as an arms dealer, Jugoimport-SDPR has innovated its business policy with an ambition to position itself in the future as a manufacturer of complex weapon systems and defense equipment.

The business policy of Jugoimport-SDPR J. P. focuses on three missions:

- Mission of Integrator of the Serbian defense industry companies in the world defense market
- Mission of development and production organization of complex weapon systems in the capacity of system integrator

- Mission of equipping the Ministry of Defense of the Republic of Serbia with imported complex weapon systems

The mission of a system integrator of the Serbian defense complex on the global defense market is carried out in cooperation with the Ministry of Defense and its institutions, as well as with the relevant state authorities, with which we have organized successfully a number of presentations and visits to state officials of the countries we cooperate with.

The second mission, no less important, includes in-house development



and production of complex weapon systems. In order to improve this business activity in an adequate way, Jugoimport-SDPR J. P. has invested considerable funds to improve the business processes of some Serbian defense companies, to make jointly market-oriented and technically competitive products and services. To this effect, at the end of the last year, Complex Weapon Systems Factory was opened in which production of complex systems will be completed.

Market research, following the trends of customer's needs and equipping, taking active part in international defense shows are and will be the basic marketing tools in defining the five-year plan necessary to keep our position on the markets of those partners with which we have been collaborating for many years, but also to acquire, with determination and know-how, new markets and create new strategic partners.

For all its success of which it is proud, Jugoimport-SDPR J. P. will continue to pursue its missions in the future and strive to adjust its business operations and its offer to the requirements of the international defense market, with the aim of accomplishing new, significant results in the global market.

For example, defense achievements of the company were presented at the exhibition of armament and military equipment UMEX 2018, which was held in UAE. As UMEX 2018 is one of the largest international fairs of armament and military equipment for unmanned water, air and ground systems, the goal of the participation at this exhibition was to present the development and production programs as well

as the technological capabilities of Jugoimport-SDPR and the Defense Industry of Serbia to a wide circle of visitors.

The models of unmanned systems which have been developed or are still under development by Jugoimport-SDPR, the Military Technical Institute and the Defense Industry of Serbia were at the core of the promotional activity at the exhibition. In addition to the unmanned systems, other complex combat systems for which the host country and some neighboring countries expressed their interest were presented through presentational modules, posters and films.

Among the systems presented were: 'Lazar 3' multi-purpose armoured vehicle, 155 mm NORA self-propelled howitzer, 'Milos' multi-purpose armoured vehicle, patrol boats, as well as 'LASTA' aircraft from the development and production programs of Jugoimport-SDPR as a system integrator.

A number of successful meetings and presentations took place during the exhibition. Jugoimport-SDPR's exhibition booth was attended by a large number of commercial visitors and foreign delegations, in particular Sheikh Abdullah bin Zayed Al Nahyan, as well as the delegations from Saudi Arabia, Indonesia, Egypt, Belarus and Mauritius.



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# 'KAZAKHSTAN PARAMOUNT ENGINEERING'

'Kazakhstan Paramount Engineering' LLP – one of flagships of defense industry of Kazakhstan, will astonish with armored wheeled vehicles (AWV) of new generation at upcoming KADEX-2018 international exhibition. Company is planning to display armored vehicles of 'Barys' family, with 6x6 and 8x8 wheel arrangement, and also 'Arlan' and 'Alan' armored vehicles with 4x4 wheel arrangement.

**If** Barys 8x8 at the previous exhibition KADEX-2016 was demonstrated with a Russian 57 mm automatic cannon on the 'AU-220M' remote weapon station, this year the AWV will appear with a remote weapon station from the Kazakhstan manufacturer 'KAE' LLP. During 2 years of manufacturer's and demonstration trials of 'Barys

8x8' a number of design, technical and tactical changes took place.

After carrying out development work for two years, 'Barys 6x6' will be presented with a unified combat compartment with stabilized cannon-machine-gun armament of the BTR 82-A.

Visitors of the exhibition will be able to see the most popular Kazakhstani armored vehicle 'Arlan' in different versions: with the 'SARP'

remote weapon station as well as with the 'SARP-S' modernized remote weapon station with a paired 7.62 mm PKT machine gun, in addition, 'Arlan' will be with reconnaissance equipment.

For the first time the company will show the 'Alan' AWV to the general public. The vehicle was designed to perform various tasks, including law enforcement, special forces and special response teams' operations,

assurance of internal security, patrolling of borders and resolution of armed conflicts.

'Kazakhstan Paramount Engineering' LLP is a domestic, unique and innovative enterprise in the territory of Central Asia. The armored vehicles manufactured at the plant comply with the highest international standards and,

by some of their military and technical characteristics, stand head and shoulders above foreign counterparts. Distinctive features of our armored vehicles are reliability, mobility and a high level of protection.

The plant is successfully fulfilling the government orders on supply of 'Arlan' and 'Alan' AWVs for the

Ministry of Defense of the Republic of Kazakhstan, as well as other law enforcement agencies of the country.

It should be noted that 'Arlan' armored wheeled vehicles that passed into service of Kazakhstani army will participate in demonstrational displays at training range during the exhibition.

/IA&MG/





# SAMPLES OF EQUIPMENT OF LAND FORCES AND SPECIAL PURPOSE

Semipalatinsk Machine-Building Plant will show samples of automotive and special equipment at the exhibition 'KADEX-2018'. So, the attention of potential customers and participants of the exhibition an enterprise will demonstrate a crawler transporter-truck tractor GT-T representing a high-speed landing vehicle of the high floatation with a monocoque hull and front leading wheels.

**T**he car is characterized by environmental friendliness, simplicity of construction, excellent maintainability and is designed to work in difficult climatic conditions on soils with low bearing capacity.

Among the exhibits are also fire tankers – AC-5 chassis-based KAMAZ and AC-11 chassis-based MAZ. The first vehicle equipped with a fire

pump, tanks for liquid fire extinguishing agents is used for delivery to the place of fire combat calculation, fire-technical equipment, emergency rescue tools, fire extinguishing agents and for conduction works on emergency response.

The second can be used as an independent combat unit or pumping unit when working 'in pumping' with one or more other tankers.

JSC 'Semipalatinsk Machine-Building Plant', which is a part of the national company 'Kazakhstan engineering', has a full cycle of machine-building production and it is specialized in the production of crawler vehicles of high passability and spare parts.

Currently, SMP is the only Kazakh enterprise having a license for the Assembly of trucks MAZ. /IA&MG/



Tatiana Valeeva

## ARMHITEC-2018

*Among the key sites for CSTO defense cooperation*

The second international exhibition of weapon systems and defense technologies ArmHiTec-2018, which is held at the 'ErevanEXPO' Exhibition Complex in Yerevan, was held in Yerevan under the auspices of Armenian Ministry of Defense. The exhibition is quickly becoming popular among the largest CSTO defense industry players. ArmHiTec participants have done great work to facilitate enhancing military and technical cooperation as well as good neighborliness between Russia and Armenia. JSC Rosoboronexport (part of the Rostec State Corporation) was organizing a unified Russian exhibit at the ArmHiTec-2018.

**O**ver 94 distinguished companies from 12 states of the world took part in the ArmHiTec-2018 which was visited by more than five thousand specialists. The biggest Exhibitor of the show was the Russian Defence-Industry Complex which exhibited 591 products. The Opening Ceremony of exhibition was visited by the President of Armenia, Minister of Defence of Armenia, Deputy Secretary General of CSTO and other honored guests. After cultural program and performance presented by the special division of the

Ministry of Defence of Armenia for the occasion of exhibition opening, President of Armenia examined the exposition area of the event which covered the territory of nearly two thousand square meters. The national pavilions of Armenian and foreign companies were presented at the show, including the enterprises from Russia, Belarus, Kazakhstan, Germany, Italy, France, Croatia, Poland, Serbia, India and China. The key goal of ArmHiTec-2018 event was to strengthen the capability of national defence, develop the Military-Industry Complex of Armenia and







**Rosoboronexport provided information on the exported aviation equipment and helicopters. Among the exhibit items were the supermaneuverable multi-purpose fighters Su-30MK and Su-35, military transport Il-76MD-90A, combat trainer Yak-130, attack helicopters Mi-28NE and Ka-52, military transport helicopter Mi-171SH and Mi-35 transport and combat helicopter. The special exporter's exhibit also demonstrated some pieces of security equipment.**

further cooperation maintenance with the partners of the state.

Deputy Director of the Federal Service on Military and Technical Cooperation of Russia Vladimir Drozhzhov was appointed head of the official Russian delegation, the combined team of the Rostec State Corporation and Rosoboronexport worked at the exhibition was headed by the special exporter's Deputy Head of the Department of Marketing Activity Vladimir Goncharov.

'Rosoboronexport traditionally pays considerable attention to defence exhibitions in the territory of CIS countries. They provide to the company an excellent opportunity to present the best models of the modern Russian weapons at the markets, which are familiar with the history and traditions of our armaments business, to display the high level of technological development

in our country. As we saw during the previous ArmHiTec exhibition, its extensive business program contributes to the strengthening of the military and technical cooperation and good neighborly relations between Russia and Armenia,' said Vladimir Goncharov.

Rosoboronexport acted as the organizer of the unified Russian exhibit at the show. At the special exporter's exhibit, representatives of foreign delegations were have a chance to see over 200 models of military equipment offered by Rosoboronexport.

Among the exhibited models of land forces armaments and materiel, the most advanced were the BTR-82A armoured personnel carrier, BMPT tank support combat vehicle, special armoured vehicles VPK-233136, 'Typhoon-K' family vehicles, 'Khризantema-S' and 'Metis'M1' anti-tank systems, as well as firearms – AK-100 series Kalashnikov assault rifles and 'Pecheneg' machineguns.

Rosoboronexport also provided information on the exported aviation equipment and helicopters. Among the exhibit items were the supermaneuverable multi-purpose fighters Su-30MK and Su-35, military transport Il-76MD-90A, combat trainer Yak-130, attack helicopters Mi-28NE

and Ka-52, military transport helicopter Mi-171SH and Mi-35 transport and combat helicopter.

The special exporter's exhibit also demonstrated some pieces of security equipment, i.e. an autonomous complex of personal identification, mobile system for situation monitoring, autonomous video and thermal surveillance posts, as well as other latest developments aimed at the protection of infrastructure and critical sites, at the fight against terrorism and organized crime.

The business program of the exhibition included many meetings between the members of the delegation and Rosoboronexport's partners from the law-enforcement agencies of Armenia and other ArmHiTec-2018 participating nations.

It should be noted that this year International exhibition ArmHiTec-2018 was attended by military delegations, leading industrial and business representatives from Europe and Near East who share ideas as to creation of up-to-date equipment. The exhibition scenario included static exposition and business events focused on introducing would-be customers to innovative, hi-tech developments and ready solutions with regard to production of military equipment and tech-

**Oleg Pogonyshchev,  
Deputy General Director, 'MONITOR SOFT' Co. Ltd**

*'Military and technical cooperation within CSTO framework has been developing with quite a success though there are some suggestions that it could be more active and efficient. Exhibitions like ArmHiTec make us know better what products are currently topical at markets and which the industry trends are. On the one hand as participants of the exhibition we have acquainted ourselves with the latest developments and achievements of our counterparts and on the other hand we have specified our suggestions in the context of military and technical cooperation to further enhance defense capabilities of all CSTO members.'*

*Our company has been engaged in IT for 25 years now. It is mostly involved in development and production of software and hardware for Federal Air Transport Agency of Russia (Rosaviatsiya), Unified Air Traffic Management System, airports, airlines and state aviation units. Our equipment is being used in all AFTN data switching centers; main, zonal and regional air traffic management centers; almost in every Russian airport and in 7 CIS states. We also do works dedicated to Ministry of Defense. Among our developments is flight plan submission system, aeronautical information management system, on-board navigation systems etc.*

*At the exhibition held in Armenia we have introduced a wide range of capabilities and products including aeronautical and traffic control information management system dedicated to air traffic service units with an electronic flight bag connected to it etc. The main concept of our developments is a maximum possible combination of capabilities and equipment in a single product which could match available systems. The products produced by our company are reasonably competitive at world markets and can outperform existing counterparts in many ways. That is why we feel safe when showing and delivering them to our clients.'*

nologies which meet armed forces' requirements.

The exhibition has been attended by many Russian enterprises. Thus, JSC 'Ryazanskiy Radiozavod' (Ryazan Radio Plant) has shown its products as part of the joint exhibition stand of JSC 'Concern 'Sozvezdie' which in its turn is a part of a stand of Rosoboronexport, the sponsor of the integrated Russian exposition. Besides simulators KUTS-E 'Ryazanskiy Radiozavod' introduced communication facilities to upgrade tanks. Such activities dedicated to Russian enterprises have been performed by the company for a long

time. Now there is an interest in it abroad.

Before the major events the radio plant has represented together with other members of the extended delegation took part in preliminary negotiations with Armenian Deputy Defense Minister. This meeting helped outline Armenian part's interest in the communication facilities produced. In the context of the exhibition defense ministry representatives of Armenia visited the stand and saw the capabilities of the goods produced by the radio plant. Following the event another meeting was hosted by the Deputy





Defense Minister to schedule further work plans as to cooperation between 'Roselektronika' holding and Ministry of Defense of Armenia.

Rostec-owned 'Roselektronika' introduced airborne troops-dedicated mobile components of integrated automated control system 'Andromeda-D'. The system components developed by Communications and Control Research Institute (Moscow) have been shown for the first time at the exhibition abroad. 'Andromeda-D' is used to control special force units as well as to ensure cooperation with other formations during combat. The system includes communication facilities, command and control vehicles, mobile command stations and other equipment. The system covers all command and control levels from top-rank commanders to fighting vehicle and individual servicemen. It provides various types of secure communications including high-speed Ethernet and videoconference.

The upgraded automated control system has been delivered to Russian airborne troops since 2015. The mobile system can be quickly deployed at special operation areas even with unprepared terrain. It includes the widest range of data transfer facilities including customary radio communication working in different bands and distances up to several hundreds km.



'Andromeda-D' instrument rooms can create an integrated network which includes every multimedia service. They use the latest technologies of full-communication radio networks to match radio stations in a number of bands including VHF, slow-speed and wide-bands. Thanks to these features the communication range may increase many times without sacrificing high-speed data transfer. 'Andromeda-D' features a wide range of unique functions to control troops during special and counter-

terrorist operations. The system has proven itself and highly appreciated by military.

In Armenia foreign experts were shown a standard field command station dedicated to all-level officers including operational command, formation-level command and special force commanders. Integrated communication facilities to create data exchange network between mobile communications stations will be shown too.

ArmHiTec-2018 has been also attended by MiG corporation representatives. 'The exhibition held in Yerevan is a good site not only for sharing experience between leading defense industry enterprises but for carrying out cooperation between industrial companies in Europe and Near East. We expect an increased interest in fighter MiG-35 which has high export capabilities', emphasized Ilya Tarasenko, General Director, MiG. In the context of the exhibition MiG introduced a model of the latest aircraft system MiG-35. The company is to hold a number of negotiations with promising partners. Russian military base located in Armenia has MiG-29 aircraft.

The products of JSC 'PO 'Elektropribor' have been much interested in at ArmHiTec-2018. The company showed speech and documentary information cryptographic encoding equipment. Besides, the exhibition stand included samples

of sophisticated multilayer printed boards, noise-suppression filters, filtering units and connections. The exhibit was attended by representatives of more than 10 countries including members of силовых структур, and defense enterprises. Following the exhibition civil products (printed boards and TV units) delivery has been outlined.

During the ArmHiTec-2018 exhibition The Russian company 'Stilsoft' discussed an opportunity to open co-production in Armenia. The company produces several complexes. One of them are the site safety control systems (military and civil). Others are radar-location and thermal-vision systems for raider detection on many kilometers distance from the border. These complexes are autonomous which is very important in border protection environment.

The production of almost all equipment is provided entirely by the company – from metal cases to microelectronics, programming of 'low level' ('insertion' of details) and 'top' (programs for the user). Moreover, the company has also presented a novelty which is now tested in Russia for the FIFA World Cup. The 'Akila' system ('eagle') recognizes faces in a flow of people. This powered box can be installed in any crowded place (including stadiums). Eight hours of effective work without external power supply is guaranteed.

The Armenian side was interested in the products of the Moscow-based Defense Systems interstate financial-industrial group. The products of this enterprise are aimed at fighting against drones, and Armenia also participates in its manufacturing projects.

At the ArmHiTec-2018 Armenian companies presented the unmanned aerial vehicles, anti-shooting arms, means of protection of staff and many other things. For example, PRO MAQ company exhibited the unmanned aerial vehicle of their own design called Hreesh ('the monster'). The 'KVKh' enterprise demonstrated the unmanned tank which is capable of transporting cargo of more than 300 kg of weight having 200 kg of its own weight. The 'Elbat' company showcased the electrolytic cells and

systems of uninterruptable power maintenance. The 'Elektron' plant presented the 'EKA-1' metal detector, 'RIA-1' mine detecting set and other solutions.

The defence industry of other foreign states was also very well presented at the event. For example, Indian company Larsen&Toubro (L&T) had its own pavilion, French NEXTER Systems corp. presented the unmanned multitask robot, Military

meetings with the members of governmental and ministry delegations, representatives of military industry of Armenia and other states. The key event of the Business Program was the International Scientific and Practical Conference held by the Ministry of Defence of Armenia and devoted to: 'Technologies of the 21st century in development of armed forces of Armenia. International cooperation experience'.



**Over 94 distinguished companies from 12 states of the world took part in the ArmHiTec-2018 which was visited by more than five thousand specialists. The biggest Exhibitor of the show was the Russian Defence-Industry Complex which exhibited 591 products. The national pavilions were of Armenia, Russia, Belarus, Kazakhstan, Germany, Italy, France, Croatia, Poland, Serbia, India and China.**

and Technical Institute of Arms and Institute of Air Force Technologies from Poland showcased the integrated aviation systems solutions and UAV samples while Bulgarian 'Arsenal' exhibited their types of small arms and ammunition among other foreign participants of the ArmHiTec-2018 show.

The Business Program of the event included a number of round-table discussions, conferences, business

The delegations of all member-states of CSTO took part in the Council meeting held on the fields of ArmHiTec-2018 event. During the exhibition work the management of the Ministry of Defence of Armenia held a line of personal meetings with representatives of more than 40 companies – exhibitors of the show. A number of agreements devoted to cooperation establishment was signed.

/IA&MG/





INTERNATIONAL AEROSPACE, MILITARY, NAVY AND TECHNOLOGY GUIDES IN 2018

	Release dates	Additional distribution
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'RA&MG' №02 (20)	April 10th	<b>DEFEXPO INDIA 2018</b> (11-14.04.2018 Chennai, India)
'RA&MG' №03 (21)	April 23th	<b>Eurasia Airshow 2018</b> (25-28.04.2018, Turkey, Antalya)
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'RA&MG'№09 (27)	September 24th	<b>ADEX 2018</b> (26-29.09.2018, Azerbaijan, Baku)
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'RA&MG'№11 (29)	October 15th	<b>Future Forces 2018</b> (15-19.10.2018, Czech, Prague)
'RA&MG'№12 (30)	October 22th	<b>EURONAVAL 2018</b> (23-26.10.2018, France, Paris)
'RA&MG'№13 (31)	November 05th	<b>Airshow China 2018</b> (06-11.11.2018, Zhuhai, China)
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'RA&MG'№16 (34)	November 26th	<b>IDEAS 2018</b> (27-30.11.2018, Pakistan, Karachi)
'RA&MG'№17 (35)	November 27th	<b>JIAE 2018</b> (28-30.11.2018, Japan, Tokyo)
'RA&MG'№18 (36)	December 01th	<b>EDEX 2018</b> (03-05.12.2018, Egypt, Cairo)
'RA&MG'№19 (37)	December 03th	<b>Expo Naval 2018</b> (04-07.12.2018, Valparaiso, Chile)

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