

RUSSIAN AVIATION & MILITARY GUIDE

Special analytical export project of the United Industrial Publishing

№ 05 (66), August 2022

THE BEST OF THE BEST
*Details of Russia's
main military parade*



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ROSOBORONEXPORT
*Successes of Russian
defence exports*



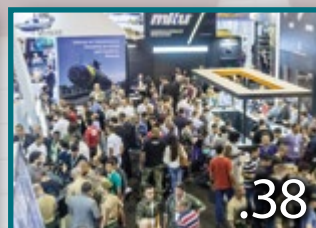
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OFFICIAL GREETINGS



Russia's main defense innovation show

The 8th International Military-Technical Forum 'Army-2022' will be held from 15 till 21 of August 2022, at Patriot Expo, Kubinka Air Base and Alabino military training grounds. International Military-Technical Forum 'Army-2022' is organized and fully supported by the Ministry of Defence of the Russian Federation and combines the exhibition and dynamic demonstration of military equipment capabilities with extensive congress program and strong participation of international audience represented by foreign exhibitors, delegations and visitors. Official operator of Forum 'Army-2022' designated by the Ministry of Defence of the Russian Federation is International Congresses and Exhibitions (MKB).

The scientific-business programme of the International Military-Technical Forum ARMY 2022 will include over 320 events. The emblematic events of the scientific-business programme will include a plenary session with the participation of senior government officials, leading Russian defence industry enterprises and heads of foreign delegations, a congress on Strategic Leadership and Artificial Intelligence Technologies, a congress dedicated to the diversification of the Russian defence industry; an international anti-fascist congress aimed at countering falsified history and the III International Fire and Rescue Congress organised by the Russian Emergency Ministry.

International Military-Technical Forum 'Army-2022' proved to be the major exhibition event in Russia in the field of advanced technologies, armament, military equipment for the armed forces and security agencies. The results of the Forum 'Army' strongly suggest that in recent seven years it has turned into one of the world's leading exhibition of armament and military equipment, the authoritative platform for discussing innovative ideas and developments for the armed forces.

We wish everyone successful and efficient work!
Good luck to you all!

Valeriy Stolnikov

VK-1600V ENGINE FOR KA-62



Twenty-five successful starts of the VK-1600V demonstrator engine were performed at the test facility of Rostec United Engine Corporation's ODK-Klimov. The tests continue. An experimental work package was carried out during the tests of VK-1600V demonstrator engine: adjustment of the engine start-up; checking of joint functioning of the units and systems in various modes; assessment of the obtained parameters for compliance with the product specifications.

The engineering tests confirmed the engine's compliance with the characteristics of the first stage of adjustment. Totally, 25 successful starts were made. Stable operation of the compressor, stable ignition of the combustion chamber, compliance of the vibration level with the established standards were registered.

'In the near future, the tests of the demonstrator engine with improved design elements will be continued, and the units' operation within autonomous plants will be checked. In addition, this year we plan to manufacture pilot samples for certification tests', Vsevolod Yeliseev, general designer of JSC ODK-Klimov, said.

VK-1600V engine developed by JSC ODK-Klimov is designed for installation on multi-purpose and special helicopters with a takeoff mass of 5-8 tons. The first object of its application is the modern multi-purpose helicopter Ka-62.

The engine design allows further development of various modifications (including for use in unmanned aircraft and within the power plant of light passenger and regional cargo planes) and expansion of the range of engines of VK-1600 family.

VK-1600V capacity in the takeoff mode is 1400 horse powers, in the mode of 2.5 minute capacity, in case of engine failure, 1750 horse powers. Specific fuel consumption in the takeoff mode is 200 g/HP-hr. The FADEC electronic system of automatic control is used with the engine. The BARK-15V automatic regulation and control unit has dual-channel architecture, compact dimensions, and combines the functions of instrumentation and control of the engine systems, and has the functions of failure diagnostics and troubleshooting. VK-1600V engines have high indicators of reliability and cost effectiveness, the engines will be operated according to their technical condition.

Status of IT Companies

Nineteen structures that are part of Rostec State Corporation were included in the register of accredited organizations that carry out activities in the field of information technology. The respective status was granted by the Ministry of Digital Development, Communications and Mass Media of the Russian Federation. The status of IT companies allows these institutions to apply for state support measures, the list of which was significantly expanded this spring.

Currently, the Ministry of Digital Development, Communications and Mass Media has granted the status of IT companies to those Rostec units that operate in such digital areas as information security, cryptographic protection, industrial software development, business process, budgeting and HR automation, as well as the creation of data storage systems and video analytics, the implementation of the Safe City and Smart Region projects.

'The Russian IT sector is receiving special support from the state today, because the digitalization of business and the increase in the Digital IQ of Russian companies is a necessity, not just a recent trend. IT solutions help advance activities in the field of public administration and urban economy, corporate and retail commercial structures to a new level of quality. Digital business also plays an important role in Rostec. For instance, the consolidated revenue of the Corporation's enterprises that have IT status exceeded 50 billion rubles in 2021,' commented Andrei Komarov, Director for Digital Transformation at Rostec State Corporation.

Russian IT companies that develop databases and computer software, as well as sell these products and provide services for their adaptation, modification, installation and maintenance, are entitled to be included in a



special state register. The IT sector entities included in the register are entitled to various benefits. Some of these benefits were provided in 2021 as part of the so-called tax maneuver, and the Decree of the President of the Russian Federation No. 83 of March 03, 2022 significantly expanded the list of support measures.

In particular, the organizations listed in the register can participate in tenders for software development and receive loans at a rate of up to 3% to finance current activities and the implementation of new projects. In addition, employees of such companies have access to preferential mortgages and a deferral from military service until they reach the age of 27.

Meeting of the CSTO CCC

Yerevan hosted the XIII meeting of the Council of the Collective Security Treaty Organization Consultative Coordination Center for Computer Incident Response (CSTO CCC), which was attended by delegations of representatives of relevant national authorized bodies.



Members of the CSTO CCC have discussed the most urgent threats to information security, such as phishing and DDoS attacks. They compared the current situation in the field of information security with the situation in 2021. They stressed the importance of further development of information cooperation to detect, prevent and eliminate the consequences of computer attacks, as well as to respond to computer incidents.

The meeting participants considered the essence of attacks, noted the importance of raising user awareness of

information security issues, and exchanged information on national approaches to counteracting the operation of phishing resources. The CCC also discussed the necessary measures to combat botnets, and the importance of interaction with telecommunications operators was emphasized. National approaches and practices used in the CSTO member States were reviewed.

The CCC members have discussed the design and preparation for a planned technical training on computer security in the second half of this year. They shared their positive experience in protecting national critical information infrastructure facilities from cyber threats, information on computer incidents in the information spaces of the CSTO member States, and information and analytical materials provided by national points of contact.

The Armenian side introduced the participants to the deployed hardware-software system for counteraction to computer attacks, using the example of one of the national facilities of critical information infrastructure, which has been upgraded this year.

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UPGRADED RUSSIAN MILITARY HELICOPTERS



Rosoboronexport JSC (part of Rostec State Corporation) showcased its partners and potential customers Russian helicopters new and upgraded versions of Russian helicopters and a wide range of applications in various weather and climatic conditions in the form of scale models and advertising materials. At the 15th International Helicopter Industry Exhibition (HeliRussia 2022) Rosoboronexport demonstrated the Ka-52 scout/attack helicopter, upgraded versions of the Mi-28NE attack and Mi-171Sh military transport helicopters, as well as the Mi-38T transport/assault helicopter. In addition, visitors to the company's booth had opportunity to get acquainted with the Mi-35M transport/attack helicopter, Mi-17V-5, Ka-32A11M, Ka-226T and Ansats military transport and utility helicopters.

The Ka-52 scout/attack helicopter, exhibited at HeliRussia 2022 as a scale model, is currently the best in the class of attack helicopters in terms of its fighting capacity and the range of aircraft weapons used, hover ceiling and rate of climb, maximum weapons load weight and sortie radius, as well as safe and autonomous operation in field conditions. Thanks to its coaxial rotor configuration, the Ka-52 offers unique in-flight performance and maneuverability, allowing it to dominate the battlefield. It is the world's only helicopter equipped with a catapult crew rescue system.

The upgraded Mi-28NE attack helicopter is fitted with the latest guided missile systems and data link equipment for interoperability with unmanned aerial vehicles, thus enhancing its capabilities against enemy targets covered by air defenses. The Mi-28NE helicopter has an increased flight speed and a higher service ceiling.

The Ka-52 and Mi-28NE are equipped with a state-of-the-art defensive aids system, which automatically protects them against infrared guided missiles, thereby greatly increasing their survivability in combat conditions. The main advantages of the Mi-38T transport/assault helicopter over the helicopters of its class available on the world market are extended flight range, payload capacity and cargo cabin volume. This helicopter can more effectively carry out troop transport and special roles (search-and-rescue, medical evacuation, VIP transportation).

Ansats Helicopter and BAS-200 UAV

Russian Helicopters Holding Company of the Rostec State Corporation will present ambulance and business versions of the Ansats helicopter and unmanned aerial system BAS-200 at the International Helicopter Industry Exhibition HeliRussia 2022.

Participants and guests of the exhibition will have an opportunity to see the modernized Ansats in an ambulance version, as supplied for the National Air Ambulance Service (NSSA). The helicopter is now fitted with a 'glass cockpit' electronic display system. Integrated onboard radio-electronic equipment is produced by the Concern Radio-Electronic Technologies. The Ansats cabins were prepared for the installation of medical modules. These aircraft are designed to transport one patient accompanied by two medical specialists.

First modernized Ansats ambulances for NSSA are on duty in Tambov, Tula, Ryazan, Beslan, Novosibirsk, Samara and other cities and regions. Due to the short takeoff preparation time important for emergency medevac the Ansats is an efficient air ambulance. Kazan Helicopter Plant and NSSA have signed contracts for 66 helicopters at the MAKS-2021 air show. As of today the Medical Service of Rostec has received 24 helicopters (14 Ansats and 10 Mi-8), with a total of 66 aircraft to be delivered: 29 Mi-8MTV-1 and 37 Ansats. The development of the regional air ambulance service is part of the Health Care National Project.

Another exhibit is Ansats Aurus, a certified version of the premium Ansats helicopter. The first Ansats Aurus has already been used for business flights at official events.

Ansats Aurus Design project was created by specialists of FSUE 'NAMI', the leading Russian scientific organization specializing in automotive development, the developer and manufacturer of the Aurus luxury cars brand.

The unmanned helicopter-based aerial system BAS-200 presented at the exhibition is suitable for a wide range of operations: area monitoring, cargo delivery, search and rescue



missions and agricultural work. The maximum takeoff weight of the drone is 200 kilograms. It can speed up to 160 km/h and carry a payload of up to 50 kg. At the same time, the BAS-200 is capable of flying up to 4 hours at altitudes up to 3900 meters. BAS-200 is currently undergoing a cycle of flight tests. The aircraft is adapted to different weather conditions. A series of test flights were conducted in December 2021, during which an airborne gravity survey using a UAV was performed for the first time. The tests were conducted jointly with the specialists of Aerogeophysics and Gazpromneft R&D center and confirmed the general possibility of performing airborne gravity measurements with the new generation of airborne gravity meters using UAVs as carriers.

The development of the BAS-200 project and flight tests of the UAV are conducted by the Mil and Kamov National Center for Helicopter Engineering. As part of the HeliRussia 2022 business program the Mil and Kamov specialists will hold the conference 'Regional demand priorities for the UAVs application: Cases and prospects' to discuss possible applications of UAVs, priorities, and market demand for unmanned aerial vehicles.

Working meeting in Minsk

In accordance with the Plan of joint training of command bodies and formations of forces and means of the CSTO collective security system for 2022, approved by the decisions of the CSTO Defense Ministers Council and the CSTO Committee of Secretaries of Security Councils, a working meeting of the heads of central bodies of encryption services of the armed forces of the CSTO member States was held in Minsk.



The working meeting was attended by the heads of the central encryption services of the armed forces of the Republic of Armenia, the Republic of Belarus, the Republic of Kazakhstan, the Kyrgyz Republic, the Russian Federation

and the Republic of Tajikistan, as well as representatives of the State Secrets Protection Department of the CSTO Center for Planning, Preparation and Training of Troops (Collective Forces) of the CSTO Joint Staff.

The working meeting participants have heard information from Colonel Sergei Voloshin, head of the State Secrets Protection Department of the CSTO Center for Planning, Preparation and Training of Troops (Collective Forces) of the CSTO Joint Staff, on the development of systems for protecting classified information and covert communications between the CSTO Joint Staff and the general staffs of the armed forces of the CSTO member States and the commands of coalition groupings of troops (forces) of the CSTO.

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STAFF TALKS ON THE EXERCISE OF THE CSTO



In the Republic of Kazakhstan in accordance with the Plan of joint training of command bodies and formations of forces and means of collective security system of the Collective Security Treaty Organization for 2022, were held the second staff talks on preparation and holding of special exercises 'Search-2022', 'Echelon-2022' and command-staff exercise 'Interaction-2022'.

Representatives of concerned ministries and agencies of the Republic of Armenia, Republic of Belarus, Republic of Kazakhstan, Kyrgyz Republic, Russian Federation, Republic of Tajikistan and a group of officers of the CSTO Joint Staff headed by Air Major General Turaly Koishikulov participated in the talks.

In the course of these staff talks, the plans for joint exercises were considered and agreed upon, the composition of national contingents of CSTO member states and issues of comprehensive support were specified. A reconnaissance of the exercise areas, command and control facilities and the deployment of personnel of the units was conducted. All three exercises, which combine the training of various components of CSTO troops (Collective Forces), are planned to be conducted in a single operational environment on the territory of the Republic of Kazakhstan at the 'Matybulak' training range.

During the special training exercise 'Search-2022', the issues of the organization and conduct of reconnaissance by forces and means of the intelligence agencies of CSTO member States in the interests of the CSTO Collective Rapid Reaction Force (CRRF) will be practised. Special exercise 'Echelon-2022' is aimed at practicing the organization of logistical support.

The command-staff exercise 'Interaction-2022' with the Collective Security Treaty Organization (CSTO) provides for practicing the preparation and conduct of a joint operation to localize an armed conflict in the Central Asian region of collective security. A new subdivision of the collective forces – a joint formation of the CSTO RBC protection and medical support – will participate in the exercise for the first time. It is planned to conduct studies on the use of the CSTO Collective Air Forces and the provision of air defence for the forces and means of the CSTO CRRF.

Portable Radar for Critical Infrastructure Facilities

Ruselectronics Holding (part of the Rostec State Corporation) has developed a portable multifunctional radar station to protect critical infrastructure facilities. The device is capable of detecting small-sized drones at a distance of more than 1,000 m, including at ultra-low altitudes. The radar is created on a domestic element base, weighs only 5 kg and can be used as a portable device.

The principle of operation of the new radar is based on the use of the Doppler effect and the processing of signals from moving objects or their moving parts. The station is capable of detecting even inconspicuous UAVs that are in hover mode by rotating the propellers. In addition, the device can be used to search for ground objects, the radar is able to detect a car at a distance of more than 10 km. As part of the Ruselectronics Holding, the development of the radar is carried out by the Rybinsk Instrument Making Plant (RZP).

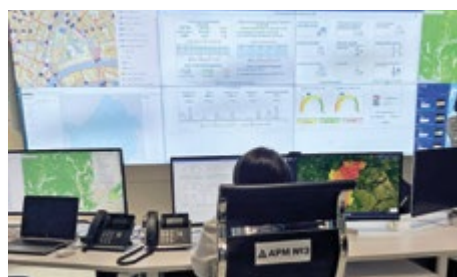
'The development of unmanned technologies is tightening security requirements at industrial, infrastructure and other critical facilities. The main task of the new radar station is to search for low-flying small-sized air targets and



other threats, such as ground-based robotic complexes. The radar can simultaneously track up to 32 targets, as well as work in conjunction with other radar monitoring systems. At the moment, the station has already passed preliminary tests,' said Andrey Komogortsev, General Director of the RZP.

Safe City

The Ruselectronics Holding has installed Forpost cyberattack detection, monitoring and prevention system at the Safe City test bench created for the EMERCOM of Russia.



The solution ensures security of personal data and automated control system data at critical facilities. Thanks to customized algorithms, Avtomatika's Forpost system ensures cybersecurity and cyberattack protection for govern-

ment and enterprise information systems, and automated process control systems. Forpost functionality includes resource integrity control, report and system message logging, software inventory information collection and hardware package instability warning.

'Nowdays, the use of systems that enable to detect and mitigate malicious actions is an essential and crucial task. This is of particular importance when it comes to cybersecurity of large software and hardware packages such as Safe City which shall continuously acquire and analyze large data volumes. Earlier, Forpost proved effective during the 2014 Winter Olympic and Paralympic Games in Sochi,' said Andrey Motorko, General Director, Concern Avtomatika.

Ballistic protection system

Helicopter Service Company of the Russian Helicopters Holding has developed a ballistic protection system for the crew and passengers of Mi-8AMT and Mi-8MTV-1 helicopters.

The armor system will be installed on helicopters used for UN peacekeeping missions. Significant advantages of armor are the possibility to use it in various climatic conditions in the temperature range from -50 to +50 degrees and it is resistant to corrosion and wear. The ballistic protection is based on a domestic fire-resistant composite material, which differs from analogues in a lower surface density while maintaining high protective properties.

The developed system guarantees a high level of protection for crew members and passengers from small arms bullets up to 7.62 mm caliber. A set of composite armor covers not only the cockpit, but also the cargo com-



partment, and its weight does not exceed 230 kilograms. The protection system is reliable, lightweight and easy to install. These advantages allow us to talk about the great potential of its use on Mi-8 series helicopters.

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GOLD MEDAL

Shvabe's Ural-based company was awarded a gold medal for BONNY mobile incubator at the 64th International Technical Fair held in Belgrade in May, 2022. Today, it is a unique portable system developed and commercially produced in Russia which is designed to ensure safe movement and transportation of newborn babies and to sustain their lives. The system has a range of advantages compared with foreign equivalents. The incubator has been developed by the Urals Optical and Mechanical Plant (UOMP) in Yekaterinburg. The product may be used both in stationary hospital conditions (including one-person operation mode) and for long-range transportation in ambulances, airplanes, helicopters and other means of transportation. This device is especially important for hard-to-reach places, for example, mountainous and forest areas. The incubator is intended for transportation of babies weighing from 1 kg to 6 kg. The system provides safe conditions inside the baby module, protects against low temperatures, vibrations and noise. Its competitive advantages include body temperature, heart rate and blood oxygen level monitoring sensors. Earlier, BONNY has been honoured with awards by the Archimedes Innovation Club (Russia), Highly Innovative Unique Foundation (Saudi Arabia), World Invention Intellectual Property Associations (WIIPA) and Toronto International Society of Innovation and Advanced Skills (TISIAS).

SECURE MESSENGER 'KOLIBRI'

The Roselectronics holding together with Open Mobile Platform company has completed the development of a secure corporate messenger 'Kolibri'. The solution, designed for devices running the Aurora 4.0 operating system, allows to securely exchange information and minimizes the possibility of information leaks. The messenger is part of a comprehensive solution that also includes a VPN client 'Kolibri' and a subscriber specialized module for cryptographic information processing in microSD card format. The module is built on a domestic element base, supports Russian crypto algorithms and has built-in information security hardware. This eliminates the risk of information leaks when connecting to corporate cloud web services. As part of the state corporation, the project is being implemented by the Penza Research Electrotechnical Institute (PNIEI) of the Roselectronics holding. 'The messenger uses only Russian trusted solutions, which guarantees the information security of corporate communications. In the future, we plan to adapt the authentication technology developed by PNIEI based on biometrics, neural networks and cryptography for the Aurora OS, as well as supplement Hummingbird products with this option,' said Vyacheslav Funtikov, CEO of PNIEI.

Certification Flight Tests of BAS-200

Certification flight tests of the BAS-200 system have been started at the Mil and Kamov National Helicopter Center. The first helicopter-type unmanned aerial system with a maximum take-off weight of 200kg and a payload of 50 kg has been included in the register of preproduction aircraft of the Ministry of Industry and Trade of the Russian Federation with No. 393 assigned to it. The type certificate for BAS-200 is expected to be obtained as early as in 2022.



BAS-200 has been accepted by the Methodological Board and has performed its first flight within the certification test at the Shuovoe air field (Moscow Region, Yegorievsk District). The flight lasted 11 minutes at an altitude of 100 meters and a speed of 60 km/h. The first flight was per-

formed satisfactorily in accordance with the approved flight program.

BAS-200 helicopter type unmanned aerial system includes two UMA's, ground control station and an aircraft transportation container. The flight preparation takes about 10 minutes only.

The unmanned aerial system flies in fully automatic mode and a semi-automatic control functionality is also available.

This model makes it possible to use a group of large UAV's to perform special missions.

BAS-200 is designed for terrain monitoring, target detection and tracking, online video transmission to the control station, cargo carriage and rescue operations.

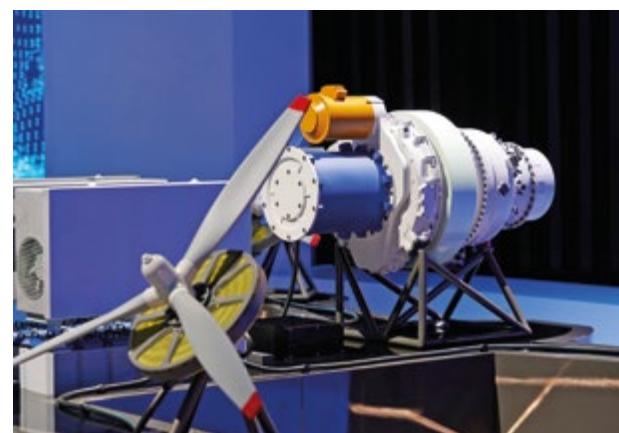
From the end of 2021, several demonstration flights and tests of BAS-200 have been performed for potential customers, where the drone has proved its target performance and functionality. Several commercial and public sector customers were interested in the BAS-200 system.

Hybrid Propulsion System Demonstrator

The hybrid propulsion system (HPS) combining the functionality of a gas-turbine engine and motor is expected to be used in light aircraft, including unmanned aerial vehicles (UAV).

UEC-Klimov, as part of the United Engine Corporation, is the primary developer. An HPS prototype was first presented at HeliRussia-2022. JSC UEC-Klimov has involved partner companies to start the manufacture of batteries, electrical machines, gas turbine drive, power control and HPS control units.

'The design engineering stage for a 150 kW HPS demonstrator has been completed, a cooperation group has been formed and the partners has started to manufacture the system components and parts. The system demonstrator is to be assembled and tested by the end of the year,' said Vsevolod Eliseev, General Designer, JSC UEC-Klimov. Upon completion of the HPS component tests in the second half of



2022, the assembly, system interaction testing and demo system testing are planned in order to validate the system performance and adopt engineering solutions. Taking into account the test results, a 500kW HPS demonstrator on the basis of

VK-650V engine will be produced. Potential applications of HPS will include light multipurpose helicopters, UAVs with a take-off weight from 2 tons to 8 tons, regional planes, air taxi, business aviation, vertical take-off and landing aircraft.

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BUSINESS VISIT



During his visit to the St. Petersburg International Economic Forum, Román Maniglia, President of Banco de Venezuela, Deputy Minister of digital economy, banking, insurance and securities under the Ministry of Economy, Finance and Foreign Trade of the Bolivarian Republic, has visited Rostec stand and got acquainted with Rostec's commercial manufacturing capabilities. Currently, Rostec is the leader in the Russian commercial and defence sectors and comprises more than 800 companies in 60 constituents of Russia. Rostec holding companies are presented in most of Russian industry sectors. Commercial products account for 45.5% of the consolidated revenue and exports cover 100 countries worldwide. 'Rostec's cooperation with South American countries has been proved for years and have survived more than one global economic crisis. Today, our professionals are focused on a range of offers for Venezuela – from IT solutions for transport and travel segments to innovative financial technology exports,' said Aleksander Nazarov, Deputy CEO of Rostec State Corporation.

Trusted strategic partnership has been established between the Russian Federation and Venezuela, the parties develop cooperation in various fields. Both countries withstand sanctions pressure and are building independent financial infrastructure.

THE CSTO JOINT TRAINING 'COBALT-2022'

In August in the Kyrgyz Republic, at the 'Edelweiss' training range in Balykchy, the tactical and special training 'Cobalt-2022' with the special forces formations included in the CSTO Collective Rapid Reaction Forces (CRRF) took place. During the training, combined groups of special forces of the member states performed training and applied operational and combat tasks of searching, blocking and neutralizing of gangs, terrorist groups, as well as closing drug smuggling channels and detection of caches, laboratories for the storage and production of drugs and their destruction. The training plan called for a command and staff training with the Operational Staff of the CSTO Collective Rapid Deployment Forces.

Next generation navigation

Concern Radio-Electronic Technologies of Rostec State Corporation has presented a prototype of the next generation navigation equipment package for helicopters. The first multifunctional central control panel similar to the systems provided for the next generation MC-21 u SSJ New planes now has been developed for helicopters.

The innovative product will make it possible to reduce the number of consoles in the helicopter cockpit and will facilitate the crew performance.

KRET's multifunctional console provides all necessary flight and navigational data for the crew and downloads, stores and updates databases containing all flight data – aeronautical, topographic and user data – as well as online and technical documentation.

The new navigation equipment package has been developed by the Ulyanovsk Instrumentation Design Bureau (as part of KRET). The multifunctional console includes: IM-16M-4NL multifunctional display, BFNI-1



navigational data generation unit and PT-3 trackball. The product enables both alphanumeric data input and operation of several interfac-

ing devices. A trackball or multi-position thumbstick and an additional multi-position control knob are used as controls.

Unique Dump Truck

The designers of the Scientific and Technical center of KAMAZ have developed a unique dump truck Kamaz-6559 designed for quarry work in autonomous mode.



The vehicle is a successor of the KAMAZ line of mining dump trucks. The unmanned vehicle, named Jupiter 30, is designed to transport loosened rock mass or ore using unmanned technology – without the presence of people in the danger zone of heavy vehicles and excavators. Because of this feature, there is no cab for the driver.

'Jupiter' was originally designed as an autonomous vehicle for quarry operations. It was equipped with all the necessary devices. It has special video cameras protected from dust, dirt, moisture and vibrations, 2D and 3D lidars, ultrasound sensors, radars. There are also GSM antennas and GPS/GLONASS navigation. Both

axles are swivel, so the vehicle has good maneuverability,' said Sergey Nazarenko, Chief Designer of Innovative Vehicles of the Research and Development Center of KAMAZ PTC.

The robotic vehicle is equipped with a KAMAZ in-line six-cylinder engine 910.12-450 with a capacity of 11.9 liters. The engine powers an electric generator that provides energy to the traction motor and charges traction batteries. All-wheel drive without a transfer case is provided by two traction electric motors, one per each axle.

The haul truck is 8,769 mm long, 2,709 mm wide, 3,499 mm high. The curb weight of the chassis is 23 tonnes, both axles (front and rear) can carry the same load – up to 25 tonnes each. The truck can transport cargo weighing up to 30 tonnes in a fully automatic or remote control mode. The speed of the vehicle is limited to 56 kph.

HELD UNDER THE PATRONAGE OF HIS EXCELLENCY, PRESIDENT ABDEL FATTAH EL-SISI
THE PRESIDENT OF THE ARAB REPUBLIC OF EGYPT,
THE SUPREME COMMANDER OF THE EGYPTIAN ARMED FORCES



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WORLD ARMS MARKET'S BESTSELLERS

Rosoboronexport JSC (part of Rostec State Corporation) has been actively promoting advanced Russian weapons and military equipment to the world arms market, which were presented during the solemn events dedicated to Victory Day commemorating the end of the Great Patriotic War of 1941-1945.



Traditionally, military parades in Russia are not only a symbol of the memory of the Great Victory over fascism, but also a demonstration of the most advanced equipment produced by the country's defense industry. In 2022, dozens of models of domestically-made weapons and military equipment drove along the streets of Moscow and other cities of the country.

Russia's main military parade took place on May 9 on Red Square in Moscow. According to the Ministry of Defense of the Russian Federation, the mechanized column included 131 units of modern military equipment, including T-14 Armata tanks, Typhoon-family MRAP wheeled armored vehicles fit-

ted with various remote-controlled weapon stations, BTR-82A armored personnel carriers, an advanced wheeled armored personnel carrier based on the Boomerang platform, Uran-9 multifunctional tracked unmanned ground combat vehicle, Tornado-G multiple rocket launcher system, MSTA-S self-propelled howitzer, Buk-M3 and Tor-M2 SAM systems, S-400 air defense missile system.

In addition, dozens of airplanes and helicopters could be seen in the skies of Russian cities across the country during these May days, as part of numerous commemorative events and preparations for them, in particular, fifth-generation Su-57 fighters, Su-30SM super-maneuverable multifunctional fighters, Su-35S multirole super-maneuverable fighters, IL-76/78 military transport aircraft and tankers, Mi-28N and Ka-52 attack helicopters.

Solemn events were also held in a number of other countries, where it was possible to get acquainted, for example, with Tigr and Patrol special purpose armored cars, Kord heavy machine gun, 7.62-mm Pecheneg machine gun, 5.45-mm AK-12 Kalashnikov assault rifle, Orlan-10 multifunctional unmanned aircraft system, etc.

Export versions of the equipment showcased during the Victory Day celebration are available in the Rosoboronexport catalog.



ROSOBORONEXPORT is Russia's sole state agency for export of the full range of defense-related and dual-use products, services and technologies. It is part of Rostec State Corporation. Rosoboronexport is among leaders in the global arms market. Rosoboronexport accounts for over 85% of Russia's exports of arms and military equipment. Rosoboronexport cooperates with more than 700 Russian defense industrial enterprises and organizations. The geographical scope of Russia's military-technical cooperation encompasses more than 100 countries.

Rosoboronexport tracks global trends, new challenges and threats to security at various levels in a timely manner and, in close cooperation with the Russian defense industry, responds promptly to emerging market demands. In recent years emphasis has been placed on the development of proposals in the field of unmanned aircraft and robotics, AI-based high-

tech products, precision guided ammunition.

In 2022, full-scale models of Russian weapons and military equipment exported by Rosoboronexport will be presented to journalists and specialized foreign professionals in the framework of the International Military-Technical Forum ARMY-2022 (August 15-21, Kubinka, rusexpo.ru).

/RA&MG/



MEASURES TO NEUTRALIZE CHALLENGES AND THREATS TO SECURITY OF CSTO

Committee of Secretaries of CSTO Security Councils discussed measures to neutralize challenges and threats to security of CSTO member states. The event took place in the narrow format of a plenary session. Secretaries of Security Councils discussed measures to neutralize challenges and threats to the security of CSTO member states, and reviewed and approved a number of important documents related to improving the management of troops (Collective Forces) and counter-terrorism. In particular, they approved a decision of the CSTO Collective Security Council to give the complex of preventive measures 'Mercenary' the status of a standing regional anti-terrorist operation.

The plan of joint training of command bodies and formations of forces and means of the CSTO Collective Security System for 2023 and a number of other documents, as well as the Plan of consultations of representatives of the CSTO member – states on the issues of foreign policy, defense and security for 2022 – 2024 were approved by the CSTO Collective Security Council. The document was elaborated taking into account the main provisions of the 2025 CSTO Collective Security Strategy and serves as a basis for consultations in the field of counter-terrorism.

At the end of the session of the Committee of Secretaries of Security Councils the Chairman of the CSSC, Secretary of the Security Council of Armenia Armen Grigoryan and Secretary General of the CSTO Stanislav Zass briefed the representatives of mass media.

Stanislav Zass said, in particular: 'Dear representatives of the mass media! The meeting of the Committee of Secretaries of Security Councils has just finished in the hospitable Armenian land in the jubilee year – the 30th anniversary of the Collective Security Treaty Organization and the 20th anniversary of the Collective

Security Treaty Organization. I want to thank the Armenian side for the excellent organization of the event. We accomplished all the tasks we set out to do.

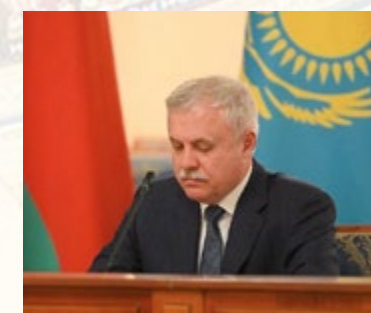
During the meeting, we conducted a detailed analysis of the military and political situation in the world and assessed the situation in the CSTO area of responsibility, as well as in the adjacent regions. Today it is with regret that we can state the crisis of the world security system as such. The arrangements that have existed for decades are in fact no longer functioning and the level of mistrust between a number of leading players has reached a critical point. At the same time, regional challenges and threats have not only not lost their acuteness, but, by virtue of the growing global uncertainty, tend to become more acute.



The CSTO principled position remains the same: we are convinced of the need for a political settlement of all existing contradictions and call upon all forces on which the state of international security depends. Along with this, we are taking all necessary measures to strengthen peace and stability in the CSTO member states and are ready to defend their interests.

We have to note the simultaneous increase of threats to the security of our states in several directions.

One of the main instruments for ensuring the security of the Organization's member States and counteracting the challenges and threats is to build up the potential of collective security forces and means and also to organize close cooperation between special services and law enforcement bodies in conducting operational and preventive measures. For the last three years within the CSTO framework we have been conducting a special preventive



operation 'Mercenary', aimed at suppressing recruitment and blocking channels for citizens of CSTO member States to enter/leave CSTO member States to participate in terrorist activities and also at neutralizing the resource base of international terrorist organizations in the CSTO area. In the first half of this year, work was actively carried out to make the CSTO special operation 'Mercenary' a standing CSTO regional anti-terrorist operation. All states supported this proposal, and today a decision has been signed on the matter.

From year to year we are building up our capacity and experience in countering drug trafficking, illegal migration and the use of information and communication technologies for criminal purposes. Special operations, respectively – 'Channel', 'Illegal' and 'PROXI', show their effectiveness and efficiency. Our operations have been recognized as best practices among professionals, including international ones, over the years. This is evidenced by the great interest in the organization of special operations by specialists in many countries and international, regional organizations. Special operations are planned for this year as well.

Given the growing challenges and threats in the information

sphere and information technology, ensuring the security of critical information infrastructure has become one of the top government priorities for all states of the Organization. Of course, the most important priority is an active offensive against criminal activities in the field of information technology.

This year we have a lot of work to do to organize practical activities of the Coordinating Council on ensuring biological security of our states.



Considering the discussion of issues of operational response to challenges and threats to security of our states, the CSTO Secretariat is preparing a package of regulatory legal acts to improve the crisis response system, which we plan to present at the fall session of the statutory bodies and the CSC.

Thus, taking into account the current situation, we have serious tasks to accomplish in order to strengthen the comprehensive potential of our Organization, to continue to work towards enhancing the prestige of the CSTO in the international arena.

The CSTO also adopted a protocol decision on holding the next meeting of the CSTO Committee of Secretaries of Security Councils in the Republic of Armenia in the fourth quarter of 2022.

/RA&MG/



TRAINING MILITARY PERSONNEL

In Moscow, a training and methodological meeting with the heads of basic training and methodological organizations for training military personnel for the CSTO member States and CSTO basic research organizations in the field of military cooperation research was held at the Military Academy of the General Staff of the Armed Forces of the Russian Federation.

The event was attended by representatives of the military education management bodies of the defense departments of the CSTO member States, the CSTO Joint Staff and the CSTO Secretariat, the management of basic training and methodological and research organizations, and other military educational institutions.

Speaking to the meeting participants, Colonel General Anatoly Sidorov, Chief of the CSTO Joint Staff, noted that the joint training of military personnel and specialists for the armed forces of the CSTO member States was one of the priority areas of military cooperation within the CSTO. The Chief of the CSTO Joint Staff said that the system of military personnel training was designed to ensure a high

level of military personnel training that met modern requirements.

Joint training is conducted in four CSTO member States: the Republic of Armenia, the Republic of Belarus, the Republic of Kazakhstan and the Russian Federation. Every year about 2,600 servicemen of the CSTO member States have joint training in 58 military educational institutions in more than 750 specialties. During the years of cooperation in the interests of the CSTO about 20,000 servicemen have been trained in universities of the CSTO member States, Colonel General Anatoly Sidorov said.

In order to solve urgent problems in the system of joint training, the Plan to improve the system of joint training of military personnel for the armed forces of the CSTO member States, which includes activities aimed at the practical

implementation of joint training of military personnel and development of scientific work within the CSTO, was approved in September 2021 by the Council of Defense Ministers and the Committee of Secretaries of Security Councils of the CSTO.

The CSTO has created and successfully operates a network of basic training, methodological and research organizations in the field of training of military personnel and specialists, aimed at diffusion of advanced technologies in educational, methodological and scientific activities, scientific support for the development of forces and means of collective security system of the CSTO.

The status of basic educational and methodological organizations of the CSTO has been assigned to



11 military educational institutions that provide training in: combined arms, air defense, missile forces and artillery, military air defense, communications, logistics, information security, electronic warfare, training of personnel of the CSTO Peacekeeping Forces, medical and pharmaceutical specialties, as well as training responsible for ensuring national security and defense capabilities of the CSTO member States.

In addition, 7 specialized research organizations and military educational institutions have been given the status of basic research organizations that carry out scientific, theoretical and practical work on the creation, improvement, training and use of the forces and means of the CSTO collective security system in the study of air defense, missile defense, Acquisition, Technology, and Logistics, medical support, electronic warfare, military and technical cooperation of the Organization and the development and use of the aviation component of the CSTO.

The Military Academy of the General Staff of the Armed Forces of the Russian Federation is the leading among the basic training and research organizations of the CSTO member States and the basic organization in the field of training personnel responsible for ensuring national security and defense capabilities of the CSTO member States.

The Chief of the CSTO Joint Staff also informed about the organization of research work during joint trainings in the CSTO format. In order to study topical problems in the development of the forces and

means of the CSTO collective security system, representatives (experts) of defense agencies, basic training, methodological and research organizations and the CSTO Joint Staff are involved in annual joint trainings held within the framework of the Organization during operational and combat training activities. Research teams, taking part in joint trainings, develop practical recommendations for resolving problematic issues and identifying areas for the further development of coalition groupings of the CSTO Troops (Collective Forces) and their use.

'Such approaches make it possible to increase the role of the scientific potential of basic training and research organizations in the development of the military component of the Organization,' Colonel General Anatoly Sidorov said.

In the course of the training and methodological meeting a wide range of topical issues of improving the system of joint training of military personnel for the CSTO member States was discussed. An exchange of views took place on the experience of organizing training in joint groups under unified training programs and plans for highly qualified military personnel in the specialties required for the formations, military forces, military units and subunits of the armed forces, other troops and military formations that are part of the CSTO forces and means of collective security.

In the course of the event, agreed approaches were developed to improve the system of joint training of military personnel for the CSTO member States and research activities.

/RA&MG/





BRIEFING FOR FOREIGN MILITARY ATTACHES

A briefing on the International Military-Technical Forum ARMY 2022 was held at the end of June this year at the Patriot congress and exhibition centre for representatives of the military and diplomatic corps of foreign states. This year, it was the first meeting for foreign military attaches authorised in the Russian Federation.



The main objectives of the event are to involve delegations and companies from foreign countries to ARMY 2022 forum and to inform foreign partners about the its events. The briefing has been attended by over 70 military diplomatic officials authorised in the Russian Federation from 40 countries.

Chief of the Main Directorate of Innovative Development of the Ministry of Defence of the Russian Federation Major General Aleksandr Osadchuk informed about the peculiarities of this forum and answered the questions of foreign visitors.



A cultural and sightseeing programme was also organised for representatives of the military diplomatic corps at the Patriot park. In particular, the foreign guests visited the museum expositions of the local Technical Centre, that has already become popular not only among amateurs, but also among recognised experts in the field of tank building and development of armoured forces.

This year, the forum is to be attended by official delegations and industrial enterprises from 129 foreign countries. At the time of this briefing, 42 countries have confirmed the participation of their delegations in the forum. Seven countries have expressed their intention to form national expositions. The forum is an international venue for negotiations, meetings of heads of foreign defence establishments with the senior staff of Russian Defence Ministry, repre-

sentatives of executive authorities of Russia and national defence industrial complex. Foreign partners take an active part in the static, dynamic and scientific-business programmes of the forum.

The International Military-Technical Forum ARMY 2022 will be held between August 15 and 21, simultaneously with the International Army Games and the X Moscow Conference on International Security that allows visitors and participants of the forum to organise their work with maximum efficiency.

The forum will be held in Patriot congress and exhibition centre, at Kubinka airfield, Alabino training ground, as well as in all the military districts and in the Northern Fleet. The representative of the organiser by the Main Directorate of Innovative Development of the Ministry of Defence of the Russian Federation. /RA&MG/



ROSOBORONEXPORT: MORE THAN 20 YEARS ON GLOBAL ARMS MARKET

November 4, 2022 will mark the 22nd anniversary of Rosoboronexport (part of the Rostec State Corporation). The company was established by decree of the President of the Russian Federation as part of the reform of the country's military-technical cooperation system. Before 2000, deliveries of Russian arms to the world market were made by Rosvooruzhenie and Promexport as well as by a number of manufacturers. Rosoboronexport was set up as the basis of effective vertical executive power in the field of military-technical cooperation. The company received the right to export the entire range of military products.

Rosoboronexport has become a leader in the international arms market over the past two decades and achieved strong results in promoting products manufactured by domestic enterprises, including those affiliated to Rostec. Its key financial indicators – the order book and the value of deliveries – have increased fivefold since 2000. Over the years, Rosoboronexport has signed more than 26,000 contracts with partners and delivered over \$180 billion worth of products to 122 countries around the world. A high level of competence, attention to trends and customer needs,

demonstrated over the years, clearly suggest that the company has good prospects for expanding its footprint and deepening cooperation with partners,' said Sergey Chemezov, CEO of Rostec and Chairman of the Board of Directors of Rosoboronexport.

Russia has consistently ranked second among the world's exporters of arms and military equipment. In two decades, foreign customers have been supplied with products for all services of the armed forces.

'Our foreign partners have received products worth over \$85 billion for their Air Force. Exports of equipment for Air Defense and Ground Forces exceeded \$30 billion for each of

these services of the armed forces and \$28 billion for the Navy,' said Alexander Mikheev, Director General of Rosoboronexport and Deputy Chairman of the Russian Engineering Union.

A key challenge facing Rosoboronexport is to bring the latest high-tech weapons and military equipment to the global arms market.

It can be expected that Rosoboronexport will launch about 50 new modern weapons and pieces of military equipment on the global arms market in the next five to seven years. Potential 'bestsellers' include products developed and manufactured by Rostec subsidiaries: Armata-



based armored vehicles assembled at UralVagonZavod (UVZ), Su-57E fifth-generation fighter jet from UAC, Ka-52K ship-based helicopter, and the upgraded Mi-28NE from Russian Helicopters. Among the products of other companies, the Antey-4000 air defense missile system from the Almaz-Antey Air and Space Corporation cannot be ignored.

In addition to the export of final products for the armed forces, Rosoboronexport has successfully extended its foreign trade competencies to the construction of infrastructure facilities, provision of space services, and training of foreign specialists in the operation of Russian products.

Foreign customers appreciate Rosoboronexport competencies and the opportunity to cooperate with Russia's defense industry through the company as a unique one-stop shop offering a full package of services for the export of high-tech military and civilian products and technology transfer.

Rosoboronexport pays special attention to industrial partnership projects with foreign customers. The company has a large portfolio of fulfilled projects for licensed production and joint ventures in India, Jordan, Malaysia, Vietnam and several other countries.

'Today the world's economies require localization and are interested in technology transfer and

job creation. Therefore, Southeast Asian and North African countries, India, and China have already established their own industrial platforms. Rosoboronexport is ready to work on them and, together with industry and Rostec State Corporation, promote Russian high-tech solutions, develop new products jointly with partners,' said Alexander Mikheev.

The promotion of dual-use and civilian products to foreign markets has become a new and promising area of Rosoboronexport's activities. The company has extensive experience in integrated supplies of utility, fire and other specialized equipment. Today, the state special exporter also delivers non-military and service weapons and is active in the markets of high-tech security equipment,

medical equipment, hospitals, and special equipment for public and private structures.

'The President has challenged the defense industry to diversify into manufacturing competitive civilian products. In order to promote them to the world market,

Rosoboronexport has set up a special business unit that will deal only with non-military products and assist companies that have no experience in independent foreign trade activities. This is a new direction that the company is implementing together with enterprises both inside and outside the defense-industrial complex. Here we see our responsibility to develop the economy of Russian regions and industry in general,' Alexander Mikheev added. /RA&MG/



ARMY2022

INTERNATIONAL MILITARY-TECHNICAL FORUM 'ARMY-2022'

August 15-21, 2022

The 8th International Military-Technical Forum 'Army-2022' will be held from 15 till 21 of August 2022, at Patriot Expo, Kubinka Air Base and Alabino military training grounds.

International Military-Technical Forum 'Army-2022' is organized and fully supported by the Ministry of Defence of the Russian Federation and combines the exhibition and dynamic demonstration of military equipment capabilities with extensive congress program and strong participation of international audience represented by foreign exhibitors, delegations and visitors.

The results of the Forum 'Army' strongly suggest that in recent seven years it has turned into one of the world's leading exhibition of armament and military equipment, the authoritative platform for discussing innovative ideas and developments for the armed forces.

Official operator of Forum 'Army-2022' designated by the Ministry of Defence of the Russian Federation is International Congresses and Exhibitions (MKB).

TOP 5

Rosoboronexport presented new russian export products of 2021

Rosoboronexport JSC (part of the Rostec State Corporation) has summed up its efforts to promote Russian weapons and military equipment on the world market in 2021.

'In 2021, the global arms market has largely adapted to work under coronavirus pandemic conditions. Exhibition activities have resumed largely, contacts with foreign customers have returned to the format of direct negotiations. Rosoboronexport took part in 10 international exhibitions abroad and 7 events held in Russia,' said Rosoboronexport General Director Alexander Mikheev. 'At the same time, the trend for promoting products on digital platforms has continued. Organizing web exhibitions, conduct of remote negotiations and multimedia presentations, and online demonstrations of new products have significantly increased interest in Russian weapons.'

Rosoboronexport and Russian defense manufacturers showed their

partners long-awaited new products at defense and security exhibitions held in 2021.

'The top 5 new export products unveiled in 2021 includes the Checkmate light tactical aircraft showcased at MAKS and Dubai Airshows, Orion-E reconnaissance/strike unmanned aircraft system demonstrated in Russia and abroad, TOS-2 Tosochka MRL with thermobaric ammunition, Kalashnikov AK-19 assault rifle and the S-350E Vityaz air defense missile system,' added Alexander Mikheev.

Rosoboronexport noted increased attention to other latest Russian-made products. In particular, great interest was shown in the Pantsir-S1M anti-aircraft gun/missile system, the Krasukha EW system and the Repellent-Patrol mobile EW system for countering small drones, which were contracted for the first

time in 2021. The full-scale models of the Mi-28NE, Ka-52 and Ka-226T helicopters in new configurations, showcased at the Dubai Air Show by Rostec's Russian Helicopters Company, have become among the most popular exhibits.

A full-scale demonstration of Russian shipbuilding industry's new ships in export configurations to foreign customers became the main achievement of the International Maritime Defense Show 2021. The delegations of Rosoboronexport's partner countries which visited the IMDS expressed satisfaction with the fact that they were able to see, visit and evaluate the ships offered to them.

'Rosoboronexport continued to strengthen its positions in regional markets. Its order book in Southeast Asia has grown significantly, the value of contracts signed in 2021 with sub-



Saharan African countries reached 2.5 billion euros,' said Alexander Mikheev. During the summit in India, a long-awaited contract was signed for the licensed production of AK-203 assault rifles with a final unprecedented 100 percent localization in the country. Negotiations on new breakthrough topics in the field of military-technical cooperation were also launched in New Delhi.

In 2022, Rosoboronexport plans to further expand the range of weapons and military equipment exported from Russia and its presence in the global market.

'We closely and timely monitor global trends, new challenges and threats to security at various levels and, in close cooperation with defense industry enterprises, respond

'The top 5 new export products unveiled in 2021 includes the Checkmate light tactical aircraft showcased at MAKS and Dubai Airshows, Orion-E reconnaissance/strike unmanned aircraft system demonstrated in Russia and abroad, TOS-2 Tosochka MRL with thermobaric ammunition, Kalashnikov AK-19 assault rifle and the S-350E Vityaz air defense missile system.'

Alexander Mikheev

to emerging market demands in a timely manner,' emphasized the head of Rosoboronexport. 'Next year we will focus on the development of proposals in the field of unmanned aircraft and robotics, AI-based high-tech products, and precision guided

ammunition. At the same time, the largest demand is expected to be for defensive systems designed to protect the sovereignty of our partners and repel air, sea and land threats, as well as for counterterrorism equipment.'

/RA&MG/





JSC RADIOZAVOD: THE BEST CONTROL SYSTEMS

In modern conditions of warfare, a real advantage over the enemy can be achieved only by improving the control system and, first of all, its basis – communication and automated control systems.

For more than 45 years JSC Radiozavod has been developing control systems and complexes for air defense formations of the Ground Forces and artillery at all levels of control.

in various geographical and climatic weather conditions, at any time of the day. The article can be used as a command post to control artillery units.

The number of unified command and staff vehicles is determined by the organizational and staff structure of military formations. The MP32M1 article as a unified command post (CP) can be used as a CP of a jet (missile) brigade /regiment /division/battery/mixed jet and missile formations of all levels of control. The MP32M1 article provides automated control of batteries (divisions) of jet and missile systems equipped with 9A52 and BM-21 combat vehicles and their modifications of large/medium-caliber MLRS complexes, foreign-made MLRS complexes, tactical and operational-tactical missile complexes.

The unified command and staff vehicle MP32M1 carries out:

- collection, processing and transmission to higher control units of data on the position, condition and security of subordinate units and subdivisions; reception, processing, documentation, display, formation and transmission to subordinate control units of commands for the preparation and application of fire strikes, including data from unmanned aircraft and space reconnaissance;

- protection against unauthorized issuance of commands for firing strikes;
- solution of special operational-tactical, calculation and information tasks;
- determination of the coordinates of the location of the article when parked and in motion.

At the International Military-Technical Forum 'ARMY 2022', a new look of the article is presented, which can be viewed at the open site of JSC Radiozavod opposite to Pavilion B. A deep modernization of the article has been carried out, which made it possible to improve the quality of planning combat missions, the accuracy of calculating data for firing and the possibility of using it in the most modern MLRS and coastal defense missile systems.

The unified command and staff vehicle has been successfully exported for many years. /RA&MG/



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For the Russian Missile Forces and artillery, JSC Radiozavod develops and supplies modern automated control means that can increase the damage inflicted on the enemy by 2-2.5 times, as well as reduce the duration of control cycles, increase the completeness and relevance of information about the enemy and at the same time reduce the consumption of ammunition.

The unified command and staff vehicle MP32M1 is designed for automated and non-automated control of missile and jet units and subunits equipped with MLRS of medium and large calibres during the organization of combat operations, during preparation and firing strikes, when parked and in motion,



BRAHMOS LEADS INDIA'S DEFENCE EXPORT AMBITIONS

Supersonic cruise missile BRAHMOS, designed and developed by India and Russia under a joint military-technological partnership venture, has edged out all other weapons of its genre to emerge as the world's best, deadliest and most versatile tactical system of modern times.

As an unparalleled multi-role, multi-platform weapon having impeccable precision attack capability to annihilate high-value ground and sea-surface targets from large, stand-off ranges, BRAHMOS has strongly positioned itself as one of India's most powerful, state-of-the-art 'force-multiplier' asset. The tactical missile has been deployed in all three Services of Indian Armed Forces – in the Navy (since 2005); in the Army (since 2007) and in the Air Force (air-launched version since 2020).

The BRAHMOS project started as a Joint Venture (JV) programme between India's DRDO and Russia's NPOM on February 12, 1998 with the signing of an inter-governmental agreement between New Delhi and Moscow. The subsequent formation of BrahMos Aerospace as the JV entity responsible for the design, development, production, marketing and delivery of the formidable BRAHMOS weapon system resulted in innumerable milestones.

Initially conceptualised as an anti-ship weapon primarily designed for launch from naval platforms,

BRAHMOS subsequently established itself as a 'universal' system, and validated its deployability onboard land and air platforms. Since its maiden successful test firing conducted on June 12, 2001, the supersonic cruise missile has been tested a record number of times to date, reinforcing its firepower, range, stealth, maneuverability and precision attack capability.

The unique BRAHMOS has thus incredibly evolved and fortified its supremacy as the world's best deterrent weapon having 'across-the-spectrum' warfare capability in the 21st century.

The tactical missile has been successfully developed, tested and inducted in land-to-land, land-to-sea, sea-to-land, sea-to-sea, air-to-land and air-to-sea configurations in the Indian Armed Forces. An underwater variant of the weapon has also been successfully tested and proved its mettle to be deployed on conventional attack submarines.

BrahMos Aerospace, in close coordination with DRDO and NPOM, has scaled newer heights in design, indigenisation, research and innovation efforts involving the BRAHMOS Weapon System.

The India-Russia JV programme achieved a major breakthrough in the defence exports front when BrahMos Aerospace on January 28, 2022 signed a contract with the Republic of Philippines to supply BRAHMOS shore-based anti-ship missile system to the Philippine Navy.

'After developing and delivering the powerful BRAHMOS to the Indian Armed Forces, we are now going to deliver it to a responsible, friendly nation. Exporting the missile to a foreign customer country has become a hallmark achievement for us. Our 'Mind-to-Market' strategy has produced this excellent result. BrahMos, the flag-bearer of 'Make-In-India', is now going to Make-for-the-World,' says Atul D Rane, DG (BrahMos, DRDO) and CEO & MD of BrahMos Aerospace.

This major development has come at a crucial time when India, under the leadership of Prime Minister Narendra Modi, aims to position itself as a top-notch military manufacturer and exporter in the world. New Delhi has set an ambitious target of a total turnover of worth \$25 billion in defence manufacturing in the next five years which includes an export target of \$5 billion worth of military hardware in the international market.

And BRAHMOS being the first full-scale major weapon system of India achieving the export breakthrough,

has provided the much-awaited impetus to boost the country's status as a net exporter of weapons in the coming years.

The India-Russia JV entity, meanwhile, has initiated work to design and develop more powerful, versatile, futuristic variants of existing BRAHMOS, including BRAHMOS-NG (Next-Generation) stealth weapon and BRAHMOS-II (K) hypersonic weapon, in order to retain and consolidate its leadership position among worldwide cruise missile makers.

/RA&MG/

UPGRADED MI-171E HELICOPTERS TO EXPORT

Rosoboronexport and Russian Helicopters, subsidiaries of Rostec State Corporation, have signed a contract to manufacture and supply a batch of upgraded Mi-171E helicopters to a foreign customer. The machines have uprated powerplants, improved avionics, and increased load-carrying capacity. The contract provides for the export delivery of the latest upgraded Mi-171E helicopters manufactured by Ulan-Ude Aviation Plant, part of Russian Helicopters Holding Company.

Our equipment is distinguished by unique design solutions, proven effectiveness and high reliability. With such a set of qualities, Russian helicopters are in demand in the global market, and demand for them remains high even in the current geopolitical situation. Rosoboronexport's order book

for Russian Helicopters products now exceeds 200 billion rubles and will grow in the coming years,' said Rostec CEO Sergey Chemezov.

Mi-17 type helicopters are successfully employed in high altitude conditions in Latin American countries, in particular, in police operations against drug trafficking. There is experience of their use in arctic

conditions in Argentina, in the tropical climate of the Asia-Pacific region and in African countries.

'In 2022, the sales of Russian helicopters supplies to foreign customers through Rosoboronexport have exceeded 30 billion rubles. Most of the exported helicopters were manufactured at Ulan-Ude Aviation Plant whose share in Rosoboronexport's

order book is currently over 80 billion rubles,' said Rosoboronexport General Director Alexander Mikheev. 'Due to strong support from the government and stable receipts from foreign customers, the plant's production facilities fully meet modern world requirements and its technological capabilities are growing and developing. This makes it possible to meet market demands for production of upgraded high-tech Mi-171Sh and Mi-171E helicopters, which are leaders in their class. The plan for export deliveries of these machines in the near term exceeds 100 units'.

The upgraded Mi-171E helicopters feature an improved powerplant consisting of two VK-2500PS-03 engines. The engines offer higher power and longer service life and are equipped with a FADEC-type digital control system.

'The rotor system has undergone a major upgrade, which includes composite main rotor blades, X-shaped tail rotor with composite blades, new swash plate and reinforced trans-



mission. The helicopter has a more aerodynamically efficient stabilizer, improved tail rotor pylon and it is now possible to install both starboard and portside sliding doors. Maximum external sling payload

has been increased by 20% to 5000 kg. A state-of-the-art avionics suite provides round-the-clock use of the helicopter in any weather,' said Alexey Kozlov, General Director of Ulan-Ude Aviation Plant. /RA&MG/





IL-78MK-90A. TANKER AIRCRAFT

Versatile platform – inflight and on the ground refuelling or transportation of cargoes

Simultaneous inflight refueling of one heavy or up to 2 tactical aircraft and up to 4 aircraft on the ground. Apart from its main mission it can be converted into a transport aircraft or for execution of other missions.

IL-78MK-90A tanker is intended for in-flight refueling of different types of aircraft by means of three aerial refueling pods and can perform fuel distribution on-ground. The aircraft may perform the take-off and landing from/on the paved and unpaved airfields.

In operation conditions during few hours the IL-78MK-90A can be converted and be employed as a transport aircraft for transportation and airdropping of vehicles, cargoes and paratroopers.

Main characteristics

Max takeoff weight, t	210
Transferable fuel inflight at a distance of 1000 km, t	78
Inflight refueling speed, km/h	450-600
Refueling pod transfer capacity inflight, l/min	up to 2.500
Maximum payload in transport version, t	60
Flight range (with 60 t payload), km	4.000
Number of transported troops / in a double deck version (in a transport variant)	145/225



Learn more about IL-78MK-90A aircraft
e-mail: roe@roe.ru
www.roe.ru



SU-57E PERSPECTIVE MULTIROLE FIGHTER

Multifunctional 5th generation aircraft system for execution of a wide range of combat tasks

Unique features of the 5th generation fighter provide covertness of combat operation due to low signature level in the radar field, ensure continued supersonic cruise flight, solve the whole range of fighter and strike tasks that are assigned on tactical aviation.

Su-57E Perspective multirole fighter is designed for execution of a wide range of combat tasks while operating against aerial, ground and surface targets day-and-night with the use of the up-to-date progressive guided and unguided weaponry.

The fighter is equipped with the most advanced avionics suite, armament and self-defense complexes. Advanced intelligent support of the fighter and high level of automation ensure effective piloting of the aircraft and execution of the whole range of combat tasks with one pilot.



Learn more about Su-57E fighter
e-mail: roe@roe.ru
www.roe.ru





'NATIONAL SECURITY. BELARUS-2022'

On June this year the 1st International Security Industry Exhibition 'National Security. Belarus-2022' was in the city of Minsk on the territory of the multidisciplinary cultural and sports complex 'Minsk-Arena. Rosoboronexport JSC (part of Rostec State Corporation) presented at the first 'National Security. Belarus-2022' Exhibition the latest Russian security solutions and more than 350 items of military, dual-use and civilian products for all services and branches of the armed forces.



The exhibition was a complex of congress and exhibition events aimed at creating a communication environment to discuss innovative ideas, exchange information about production and technological achievements in the field of special means, special equipment and armament, and also to demonstrate on a large scale high-tech, innovative developments and ready-made solutions that contribute to improving technical equipment of law enforcement agencies and other power structures, the activities of which are aimed at implementing the state policy of the Republic of Belarus in the sphere of national security.

The exhibition schedule included the following events:

- demonstration performances of units of the Interior Ministry troops of the Republic of Belarus, canine service, customs authorities of the Republic of Belarus and the Ministry of Emergency Situations of the Republic of Belarus;
- Round table of the State Border Committee of the Republic of Belarus 'Priority directions of technical equipment of the state border at the present stage';
- Conference 'Safe state – Territory of possibilities';
- Scientific conference 'Topical problems of cyber security in the conditions of ensuring national security of the state'.

CSTO Secretary General Stanislav Zas took part in the official opening ceremony of the Exhibition. Speaking



at the opening ceremony Stanislav Zas said: 'This is the first and unique exhibition in the post-Soviet space. Its thematic focus is topical and timely, especially in conditions of continued growth of challenges and threats to the security of our individual, society and state. Scientific and technological achievements and sustainable development of defense industries of CSTO member states today become one of the key elements in ensuring security of the state and its citizens and occupy a worthy place in the development of national and collective security system.

Our Organization will continue to uphold the principles of developing cooperation between brotherly nations to ensure stability and collective response to any challenges and crisis situations. I am confident that the Belarusian Security Industry Exhibition will give an additional impetus to the development of the defense and industrial complexes of the CSTO member states, as well as the improvement of scientific, technical, technological and production potential.

The event will help solve the issues of technical equipment of the Armed Forces, law enforcement bodies, state security bodies and special services, other troops and military formations, fire and rescue bodies of both the Republic of Belarus and other CSTO member states with modern models of weapons, military and special equipment.

We are grateful to the organizers and organizers of the exhibition for the opportunity to display one's achievements and learn about international experience in developing

and producing cutting-edge equipment for the uniformed services. I wish all the participants and guests of the exhibition productive work, fruitful business contacts, mutually beneficial cooperation, good health and prosperity!

At its stand, Rosoboronexport showcased and presented a wide range of equipment for law enforcement agencies, counter-terror units and special services involved in the protection of borders, critical government, social and transportation infrastructure facilities. Many items were exhibited in Belarus for the first time.

The company was demonstrated various special means and means of self-defense, as well as two personal protective equipment (PPE) kits, including Tor and Tor-2 helmets, Taktika and Topaz modular bulletproof vests, Condor protective goggles and Cobalt-S splinter-proof overalls, which protects not only against fragments and cuts with sharp objects, but also against exposure to open flame, convective heat transfer and thermal radiation. The ergonomic design of these kits enables their adaptation to any conditions through the use of removable components and a wide choice of optional equipment.

Rosoboronexport's exhibit featured the most popular models of Russian civilian and service small arms, which have received excellent feedback from the world professional community. Lobaev Arms showed the DVL-10 M1 Saboteur modular multi-caliber precision rifle for shooting at a range of up to 800 meters, DXL-3 Retaliation long-range counter-sniper rifle having an effective



range of up to 1800 meters and the DXL-4 Sevastopol ultra-long-range sniper rifle capable of hitting a target at up to 2300 meters.

The company showed special optics of the Dedal and Infratech trademarks designed for installation on both service small arms and assault rifles, machine guns and sniper rifles. Also company made a public presentation entitled 'Security Equipment'. During the presentation, the latest models of special small arms, body armor and special optics were demonstrated.

During the exhibition, Rosoboronexport also actively promoted Russian civilian systems and solutions in the field of medicine, fire safety, disaster prevention and mitigation, information security as well as the latest Safe City technologies. /RA&MG/



LAAD 2023

The return of the largest Defence and Security fair in Brazil under new management

The 13th edition of LAAD Defence & Security, the largest and most important defense fair in Latin America, will take place from April 11 to 14, 2023, in Riocentro, Rio de Janeiro. The big news for the administration, which is no longer for the British Clarion and went to Creative Events, a Brazilian company by Sergio Jardim, which has been in front of it since 2007. Sergio Jardim answered a few questions about LAAD 2023.



- Mister Jardim, in each new edition of LAAD we see a significant expansion of the exhibition area and number of exhibitors, what are your expectations for LAAD 2023?

- We expect that LAAD 2023 will repeat the success of LAAD 2019 and bring a greater number of national and foreign exhibitors. To a large extent this is due to the interest that Brazil arouses in the defense and security industry due to the opportunities and challenges that the country presents in this area.

- What are the new features planned for this edition?

- The resumption of LAAD shows overcoming the challenges of the

pandemic and the opportunity to bring together, in a face-to-face event, the Armed Forces of countries in the region with a defense and security industry that demands the opportunity to launch new products and to meet new customers.

- On the subject of Covid-19, which security measures will be implemented in this edition?

- Creative Events will follow the protocols required by the authorities at the time of the show and the additional protocols established by the events industry. We can mention measures that are being adopted today but that may be updated in April 2023: adjustment and access control to meet new capacities, proof of vaccination certificate, expansion of the medical

center, specific signage, preferential use of digital media, Alcohol-based hand sanitizers, booths with more open spaces, individual packages, among others.

- Brazil, and several countries in the region, have been increasing their Armed Forces processes modernization, how can LAAD contribute to this?

- LAAD brings to Brazil and countries in the region the opportunity of face-to-face contact with providers of products, services and technologies, which can be used to modernize their means. The exhibited items represent the state of the art in technology in this industry.

- The public security and civil defense sector has also undergone major changes, with changes in procedures and the acquisition of new materials, how do companies see these movements?

- LAAD brings many exhibitors working in the public security and civil defense sectors, displaying products, services and technology specifically targeted at these sectors. Companies in this industry are prepared to exhibit the modern means that the sectors demand.

- Will LAAD's management changes benefit the event participants?

- The presence of Clarion in Brazil, a multinational company with more than 200 annual events in 20 different industries, allowed us to have contact with world-class techniques and tools in the organization of fairs. Creative Events, as a Brazilian company run by Brazilians, will use this background and it will be in a better position to provide agile and dedicated service, to build and guide the future of our fairs.

- What prospects do you have for the future of LAAD?

- LAAD plays a fundamental role in integrating the exponents of the Brazilian and international defense and security industry with the officers of the Armed Forces of the region, thus allowing periodic updates on products, services and technologies. We look forward to continuing to meet this important

demand and improving with each future edition of LAAD Defence & Security.

- What are the main products that will be on display?

- LAAD brings a wide range of products. Among others, equipment for communications, radars, personal protection, weapons for personal use, armor, missiles, airplanes and helicopters, combat and troop transport vehicles, ships and vessels, military engineering, integrated control, training and simulation systems, uniforms, air defense systems, satellites, equipment for special forces, fire systems, optical systems, parachutes, etc.

- How is the role of Defense and other authorities in LAAD?

- The Ministry of Defense and the Armed Forces have given institutional support to the fair since its first edition and invite official delegations from more than 100 countries to attend the event. The Minister and the Commanders of the singular forces maintain offices at the fair. Creative Events works with Defense to operationalize the fair's strategic planning, bring exhibitors and invite visitors. The Ministry of Justice and the Councils of law enforcement agencies also provide institutional support to the event.

- What is LAAD's most important program?

- A fundamental part of the fair is the Official Delegations Program, which organizes the visit of official delegations, from the confirmation of invitations and use of the official hotel, to support in visiting companies at their stands during the days of the event. LAAD brings 183 official delegations from 81 countries, totaling around 400 official delegates. The same team also organizes the presence of 350 police authorities.

/RA&MG/



ARMY EXPO THROUGH THE PRISM OF WORLD'S MEDIA FROM ASIA TO AMERICAS

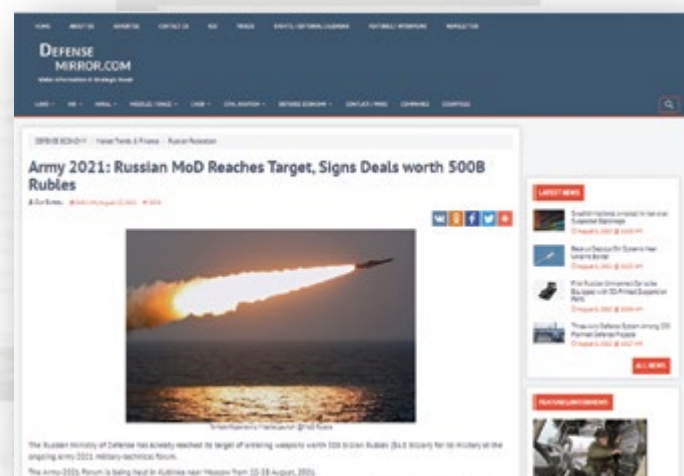
The annual International Military-Technical Forum ARMY, launched in 2015, has already become one of the most renowned global defense shows. It is organized and fully supported by the Ministry of Defence of the Russian Federation and combines the exhibition and dynamic demonstration of military equipment capabilities with extensive congress program and large participation of international audience represented by foreign exhibitors, delegations and visitors. The 8th International Military-Technical Forum ARMY-2022 will be held from 15 till 21 of August 2022, at Patriot Expo, Kubinka Air Base and Alabino military training grounds.

Russian Ministry of Defense: 'The results of the Forum ARMY strongly suggest that in recent seven years it has turned into one of the world's leading exhibition of armament and military equipment, the authoritative platform for discussing innovative ideas and developments for the armed forces.'

'Forum Army is a unique platform for demonstration of the best achievements in military field being represented with modern and advanced units of smart weapon, military equipment and technologies, construction and maintenance projects, as well as outstanding opportunity for companies and enterprises to demonstrate its products for further integration into cooperation within military-industrial complex', – emphasizes the Russian MoD.

Major international defense-related media have extensively covered the ARMY expos both distantly and by visiting the event in person. In 2021 the Defence Review Asia called the expo a 'success', while the DefenseMirror stressed, that the Russian MoD signed contracts worth billions at the show.

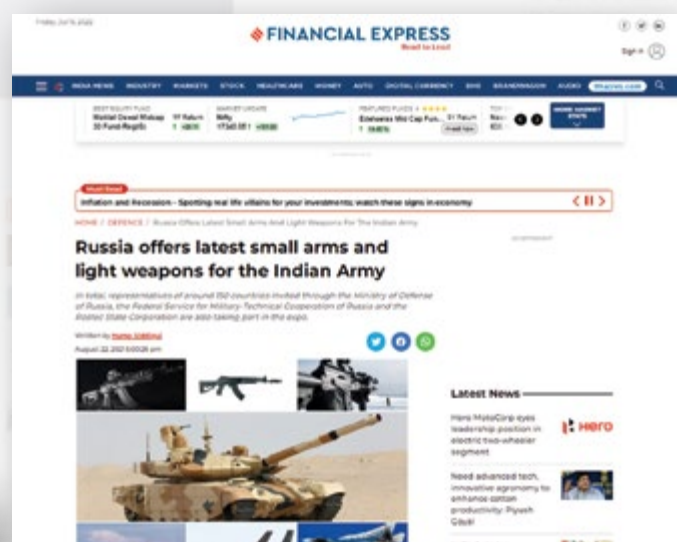
We provide the highlights of the ARMY-2021 coverage by the media of different countries.



India

The ARMY expo has always been in the Indian media's focus. Last year India's **Financial Express** published the *Russia offers latest small arms and light weapons for the Indian Army* story, highlighting the prospects of the Russia-India cooperation in the field of infantry weapons.

'Ahead of the inauguration of the Army 2021 Expo in Moscow on Sunday, Rosoboronexport JSC expressed its readiness to offer to India the whole range of small arms and light weapons, including assault rifles, machine guns, sniper rifles, submachine guns, pistols, grenade launchers etc', wrote Financial Express's **Huma Siddiqui**.



The article stressed, that all what was being offered to India had been tested and was known for their reliability, and lots of these weapons had proven their effectiveness in real combat use. Russia had also developed technical means to train small arms use, which can be integrated into a joint virtual environment to conduct full-scale training sessions.

The Financial Express added that in total, representatives of around 150 countries were invited through the Ministry of Defense of Russia, the Federal Service for Military-Technical Cooperation of Russia and the Rostec State Corporation.

'For the first time the newest T-14 Armata tank, combat vehicles based on the Boomerang combat platform will be displayed. And, the Orion-E reconnaissance/strike UAV, which is the star of this year, the Antey-4000 battlefield anti-aircraft missile system designed to equip the land forces, and the Pantsir-S1M air defense gun/missile system are being displayed. There are going to be the fifth-generation Su-57 fighter, helicopters, the BK-16 high-speed landing boat, and the latest small arms,' the Financial Express quoted Rosoboronexport's CEO Alexander Mikheev.

'What will be of interest for the Indian Army during the expo will be small arms. This includes Kalashnikov AK-100 series, AK-200 series, AK-12, AK-15 and AK-19 assault rifles. On display will also be KORD assault rifles, sniper rifles and machine guns which are being manufactured by the Kalashnikov Concern and the Degtyarev Plant, which are part of the Rostec State Corporation'

The Indian **Zee News** published the video report on the AK203 assault rifle.

'AK-203 is the latest version of the AK-47 rifle. India planned to purchase 7,00,000 AK-203 from Russia.'



Hindu's **Dinakar Peri** in his Moscow-Delhi cooperation analysis piece outlined the major bilateral joint defense programs and their prospects.

'FSMTC Director Dmitry Shugaev said there was a good order portfolio equal to about \$15 bn with India under way and the deal for the production of AK-203 assault rifles through a joint venture was on'.

The **Aviation & Defence Universe** made a report on the famous Russian Knights aerobatic team's performance showing the unrivalled capabilities of the Su-35 multifunctional fighter jets.

'Russian Knights, the aerobatic group will demonstrate its updated program to the guests of the ARMY 2021 International Military and Technical Forum. It includes several new elements. For example, when demonstrating group aerobatics in the composition of six crews, the group will perform a turn and Nesterov loop in a row in the afterburner mode of the engines. After the first disbandment, as part of four crews in a diamond formation, the Russian Knights



will perform a bunch of several rotations: a group roll, a loop with a 180-degree turn on the descending part and an ear maneuver, including a combat turn, half roll and half roll.

In addition to the Russian Knights, the crews of the aerobatic teams Swifts and Berkuts will show their skills during ARMY 2021 International Military and Technical Forum. Separately, it should be noted that during the forum pair aerobatics will be demonstrated on Su-57 aircraft. In total, an air show of more than 30 modern and promising aircraft complexes was planned to demonstrate the flight technical capabilities'.

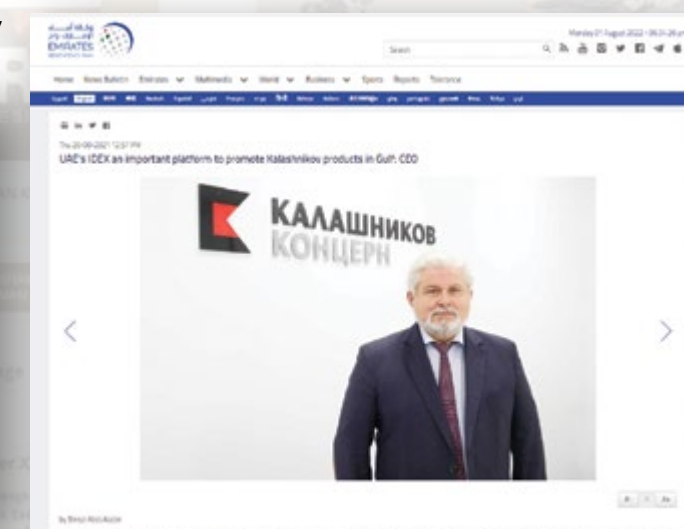
The **DefenseMirror** highlighted the demonstration of the weapons that 'proved' themselves in Syria to the Saudi Arabian delegation.



'Saudi Arabian delegation taking part in Army-2021 Forum in Kubinka outside Moscow were shown some of the weapons that 'proved' themselves in Syria. On August 23, Russian Defense Minister Sergei Shoigu thanked Deputy Minister of Defense of the Kingdom of Saudi Arabia, Prince Khaled bin Salman for his visit to the VII International Military-Technical Forum 'Army-2021'.

From Jakarta to Buenos-Aires

The ARMY-2021 was covered by **WAM** – the official news agency of the United Arab Emirates. In its UAE's IDEX *an important platform to promote Kalashnikov products in Gulf*: CEO report WAM highlighted the latest Kalashnikov group's products premiered at the global arms market.



‘This year’s International Defence Exhibition and the Naval Defence Exhibition (IDEX and NAVDEX) in Abu Dhabi has helped promote Kalashnikov products in the Arabian Gulf region, according to the top executive of the Kalashnikov group of companies, the largest Russian arms manufacturer globally known for its AK-47 rifles.’

‘We hope that our new 9 mm submachine gun PPK-20 will be of particular interest to the special and security forces in the Gulf region,’ – WAM quoted Vladimir Lepin, CEO of the group.

The Kalashnikov unveiled at the ARMY-2021 a prototype of PPK-20 submachine gun among other promising products.

‘The submachine gun can also serve as PDW (Personal Defence Weapon), a firearm for combat vehicle crews or various support units, and for special force units that operate in urban areas, inside structures and vehicles, and in crowded environments. The company also displayed the production version of the brand-new MP-155 Ultima SMART shotgun at ARMY-2021. The gun is designed to meet the requirements of modern users who cannot go without hi-tech gadgets. Its world debut took place at IDEX in February 2021 in Abu Dhabi’, – reported WAM.

‘Kalashnikov has always been identical as an assault rifle manufacturer, but there is something new from the International Military-Technical Forum ARMY-2021, where for the first time Kalashnikov has released a prototype Submachine Gun (SMG) that carries a NATO caliber of 9x19 mm, which is the PPK-20’, – wrote on the PPK-20 the Indonesian **Indomiliter**.



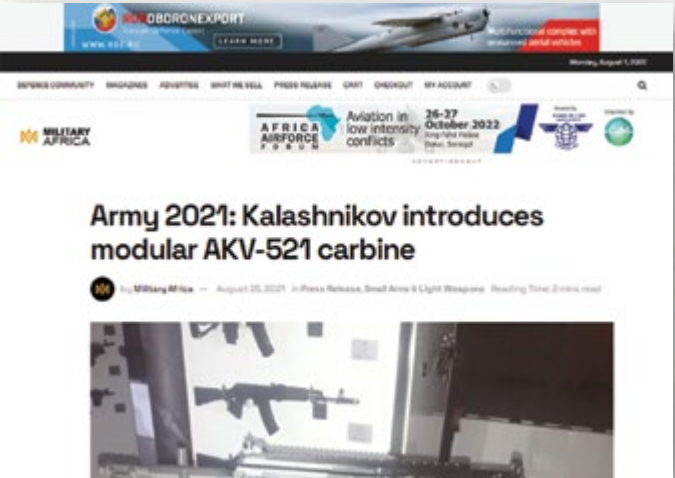
The Indomiliter also covered in details the Kornet-EM anti-tank missile system, mounted on the Typhoon MRAP (Mine-Resistant Ambush Protected) vehicle.



‘Continuing the generation of the legendary Kornet anti-tank missile, at the International Military-Technical Forum ARMY-2021, Russia is displaying a new variant of the Kornet missile which is labeled the Kornet-EM multipurpose long-range missile system. It is mounted on the K-armoured platform. Kornet-EM is expected to destroy modern tanks equipped with dynamic protection, light armored vehicles, enemy stronghold bases, to low-speed air targets (helicopters and drones). And of course, this new missile can be used throughout the day, in extreme weather conditions and in conditions of electronic and optical interference from opponents’.

Africa and Latin America

ARMY-2021 was also covered by the media in Africa – for example, the Nigerian **Military Africa** published a large overview of the small arms, combat helicopters etc. In its *Army 2021: Kalashnikov introduces modular AKV-521 carbine* it analyzed the newest Kalashnikov civil firearm.



‘For the first time, Kalashnikov Group will demonstrate AKV-521 civilian carbine at the International Military-Technical Forum ‘ARMY-2021’. The carbine is based on the reliable and time-tested AK design (gas-operated system, locking mechanism, magazine, trigger group, muzzle brake, pistol grip, and buttstock). The solutions implemented in the AKV-521 carbine have proven their effectiveness as they are applied in small arms in various countries worldwide: upper and lower receiver, the full-length 1913-MIL-STD/Picatinny-type rail, and the detachable charging handle’.

The Military Africa also reported in details on the Mi-24/35 combat helicopter family.

‘The rotorcraft was produced both for the Soviet army and for export sales being designated as Mi-35P. The combat application history of Mi-24/35 type helicopters includes over 30 military conflicts worldwide. Mi-24/35 type helicopters were the first Russian-made rotorcraft designed specifically for the combat operations. The design of the helicopter was such a success that its modified versions are still in operation’.

The Nigerian journalists specified the advantages of the Mi-35P version.

‘The updated Mi-35P features high standards of reliability, combat effectiveness and survivability, wide application possibilities. Same as Mi-24P the aircraft can be used as a combat helicopter for destruction of tanks and other armored vehicles, as a troop-carrier for airlifting of 8 troopers, as an ambulance for transportation of two casualties and a medical attendant, and a cargo-carrier for transportation of cargoes inside the cargo cabin’.

The **Armyrecognition** international military media covered the ARMY-2021 in much details. One of its stories was dedicated to the modernized light multipurpose Ka-226T Climber helicopter.



‘The upgraded Ka-226T differs significantly from the Ka-226 family. The helicopter has a new airframe design with substantially improved aerodynamics. The fuselage is made using modern light-weight materials, the helicopter’s control and electrical system have been modernized, and an impact-resistant fuel system that meets increased safety requirements has been installed. At the same time, fuel tanks volume has been increased with the provision of centralized refuelling. A new complex of pilot navigation and radio communication equipment was also added. The helicopter is ideally suited for high-altitude flights, and his working project received a new title ‘Climber’. It is characterized by low vibration, ease and simplicity of operation, the ability to take off and land on small size sites, including in urban infrastructure, high accuracy of hovering even when carrying cargo on the external suspension, safe passengers boarding with working rotors’.

Another piece was about the latest Russian parachute system.



‘Technodinamika holding company (part of Rostec State Corporation) is testing a new parachute capable of landing combat swimmers in full gear directly onto the water. The system allows the combat swimmer to quickly and safely get rid of the parachute and proceed with their combat mission underwater. The parachute system capable of landing combat swimmers in full gear directly onto the water was developed by specialists of the Polyot Ivanovo Parachute Plant of the Technodinamika holding company. It can be used for airdrops at altitudes up to 8,000 m at an aircraft speed of 140-350 km/h. The 37.2 m2 ram-air type parachute provides a carry-

ing capacity of up to 225 kg, allowing to fasten special diving equipment and deploy a diver in full gear. In addition, there is a mount for a universal cargo strap providing 130 kg of capacity’.

The **Zona-Militar** from Argentina summarized the results of the ARMY-2021 expo in its *Russia wins contracts worth more than 2 billion euros at the Army 2021 exhibition overview*.



‘The company Rosoboronexport held more than 70 negotiations with representatives of 35 countries during the International Military-Technical Forum ARMY 2021. Its general director, Alexander Mikheev, stated that ‘based on the results of the negotiations held with foreign partners within the framework of the ARMY-2021 forum, Rosoboronexport concluded about 20 contractual documents for a total amount of more than 2 billion euros’. Under the agreements signed with foreign customers, Rosoboronexport will export in the coming years the production of Russian companies in the defense sector for all branches of the armed forces, as well as means of radio-electronic warfare and anti-aircraft defense’.

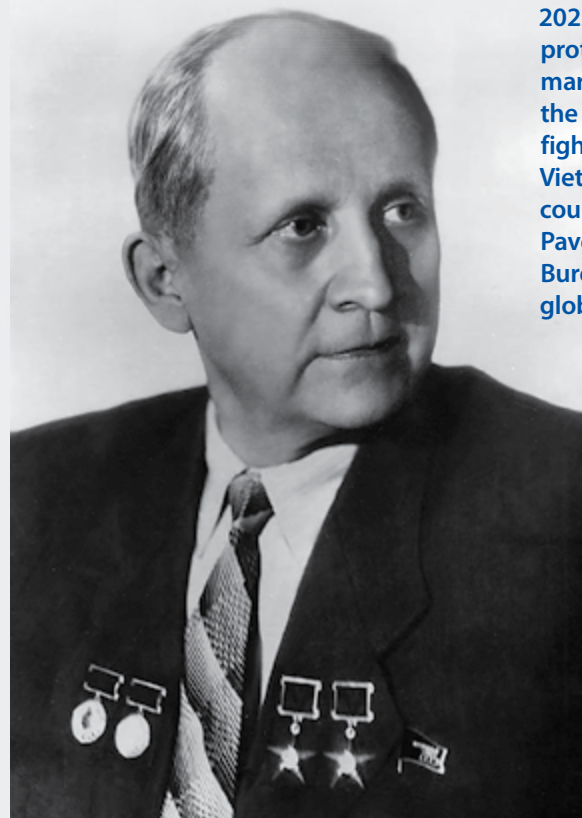
The first-hand impressions from the expo was delivered by the South African **Ultimate Defense** magazine.

‘A large number of private Russian companies, many of which already perform defence work, took part in the annual Army forum, which ran from 22–28 August, while other small private companies sought to attract the attention, and contracts, from Russia’s largest contractors. In total more than 50 new weapon systems were on display at the forum. While behind the scenes meetings and forums taking place, thousands of visitors were drawn to the displays of military might. As foreign media we were impressed by the sheer size of the Kubinka Air Base and Alabino military training grounds.

One of the new activities featured during the event was the robotics competition showcasing military robots designed for combat operations, reconnaissance, mine clearing, extinguishing fires, and operating in hazardous environments’.



PAVEL SUKHOI'S COMBAT FAMILY: FIGHTERS THAT HAVE NO MATCH IN THE WORLD



2022 marks the 45th anniversary of the maiden flight of the Su-27 fighter prototype developed by the Sukhoi Experimental Design Bureau, which marked the birth of the famed family of Su-27/Su-30 fighter jets. In the 21st century, the Su-27/Su-30 became among the most in-demand fighters in the world: they were purchased by Angola, Belarus, Venezuela, Vietnam, India, Indonesia, Kazakhstan, China, Malaysia, Uganda and other countries. Much of the credit for this should go both to aircraft designer Pavel Osipovich Sukhoi personally and the team of his unparalleled Design Bureau, which managed to derive a technically perfect formula for the global success of the Sukhoi brand.

Air superiority is a key factor in any confrontation. That is why we pay great attention to developing new advanced platforms. At one time, the Su-27 became a technologically breakthrough machine and the progenitor of a whole family of outstanding aircraft: the Su-30, Su-34 and Su-35. Today, these jets are the mainstay of the Russian Aerospace Forces and successfully perform missions even under especially adverse conditions on a daily basis. This is a vivid dem-

onstration of our technological capabilities,' said Vladimir Artyakov, First Deputy Director General of Rostec State Corporation.

Currently, the family of Russia's Sukhoi high-performance heavy multi-mission aircraft systems offered for export is represented by Su-30SME, Su-34E and Su-35 4+/4++ generation aircraft.

'Rosoboronexport has delivered about 700 Su-27/Su-30 combat aircraft abroad since 2000. In 2021, the company's order portfolio was replenished with new contracts

for the supply of Su-30SMs,' said Alexander Mikheev, Director General of Rosoboronexport (part of Rostec State Corporation). 'Over the past 10 years, the share of aircraft supplies in Russia's total arms exports has stood at 40-50%, and even exceeds this figure today. Currently, our partners highly appreciate the fact that engines, avionics, weapons, systems and components in Russian combat aircraft are exclusively Russian-made. This ensures the independence of the purchasing countries from unfair actions taken by third countries. In addition, an open architecture of avionics and weapons systems, implemented in Russian fighters, enables foreign customers, with the involvement of the Sukhoi Design Bureau, to integrate some of domestically-made systems and air-launched weapons into them.'

The Russian Aerospace Forces is the largest operator of Sukhoi combat aircraft. According to the Russian Ministry of Defense (www.mil.ru), Su-30SM and Su-35 aircraft can effectively intercept air targets and attack military installations with precision-guided weapons from low, medium and high altitudes. Their airborne equipment enables the use of air weapons with maximum accuracy. According to Hero of Russia fighter pilot Major Viktor Dudin, the Su-35 is a perfect fighter that surpasses all its foreign counterparts.

The Su-35 is a powerful 4++ generation aircraft system that incorporates fifth-generation fighter technologies. The Su-35 handles the entire range of fighter missions over a wide altitude and speed envelope. A large number of hardpoints allows the use of up to 12 medium-range air-to-air guided missiles or 6 air-to-surface missiles in one sortie. Its powerful onboard radar can detect aerial targets at long ranges (up to 350 km). The Su-35 also effectively engages ground (surface) targets, including without entering the enemy's air defense zone. In addition, the Su-35 is able to control a group of airplanes in the air, acting as an AWACS aircraft.

Key advantages of Su fighters:

- super-maneuverability that gives a clear edge in close air combat,

enabling the Su aircraft, inter alia, to disrupt retaliatory missile attacks;

- powerful missiles and rockets plus a 30 mm autocannon;
- autonomous basing and in-flight refueling capability;
- open architecture of the avionics and weapons systems.

'The intensity of military threats in the world is not decreasing, which predetermines an increased interest in Russian combat planes, which have proved their reliability and effectiveness and outperform their Western counterparts in many respects,' Alexander Mikheev stressed. 'In the foreseeable future, the predominant combat effectiveness of Russian aircraft will remain, and continuous platform upgrading is underway, as clearly illustrated by the case of the Su-57. In this context, it is curious that some Western media, throwing in fakes about the alleged 'technological gap of the Russians,' are silent about the fact that a mere appearance of Russian fighters in the sky often dramatically changes the situation in the theater of war not in favor of the enemy.'

One of the most notable foreign operators of Su-30 type fighters is India, where the program of licensed production of Su-30MKI fighters, which make up the backbone of the country's Air Force, has been successfully implemented. Rosoboronexport, within the framework of the Make in India program, is ready to supply additional completely knocked



down kits for the assembly of the Su-30MKI and carry out joint work on their modernization, including the integration of the latest air weapons, avionics, etc. At the same time, the existing portfolio of aviation projects allows the company to globally develop technological cooperation in a broad range of areas.

By the way, the world-famous Russian Knights and Falcons of Russia aerobatic teams, flying Su-27/Su-30/Su-35 fighters, have repeatedly received applause from the audience at international air shows in dozens of countries around the world. Even the presidents and prime ministers of the customer countries, who participated in the demo flights of these beautiful aircraft, have repeatedly convinced themselves of the high flight performance and reliability of the Russian Sukhoi fighters. This summer, the legendary aircraft will be demonstrated at the ARMY-2022 International Military and Technical Forum.

/RA&MG/





RUSSIAN-STYLE AEROBATICS

This year marks the 135th anniversary of the birth of Pyotr Nesterov, an outstanding pilot who performed a 'dead loop'. This maneuver became the first aerobatic figure and is often referred to as 'Nesterov's loop'. There is quite a number of aerobatic maneuvers that are named after our compatriots. We have selected five most famous among them.

Dead loop

This maneuver looks like a closed loop in the vertical plane. The attribute 'dead' appeared in its name due to the fact that this aerobatic maneuver existed only in theory for a long time, and

nobody could successfully perform this risky trick in the sky. All attempts ended tragically – the planes of that time simply crumbled because of high overloads.

Pilot Pyotr Nesterov was the first who managed to bring the loop 'to live' in 1913. 'Air is quite

a homogeneous medium in all directions. It will hold the plane in any position provided that the plane is controlled properly,' wrote Pyotr to justify his risky undertaking. Nesterov was so confident in his calculations that he even wasn't strapped in his old Nieuport before the 'dead loop' attempt. Happily for him, the calculations proved to be correct and he didn't fall out at the top of the loop – the centrifugal force pressed the pilot against his seat.

To date, Nesterov's loop is recognized as the most popular among all aerobatic figures. During his short career as a pilot, Nesterov managed to make another breakthrough in aviation – the first-ever taran (air ramming), unfortunately, at the expense of his life.



Flat spin

In the early days of aviation, a spin was not a stunning aerobatic maneuver at all, but rather one of the saddest experiences for any pilot. The aircraft literally spins out of control, falls down spiraling and rotating about its axis at the same time.

It was impossible to overcome the spin and pilots died inevitably in such situation. But in August 1912, one pilot had great luck. British aviator Wilfred Parke entered a spin, but moved the stick in the direction opposite to the aircraft rotation at the last moment. The plane came out of the spin and Parke survived.

Russian pilot Konstantin Artseulov, having studied Parke's history, came to a conclusion that a spin was not always fatal – the plane, when controlled properly, can recover from the spin. On September 24, 1916, Artseulov decided to demonstrate this in practice – he intentionally drove his Nieuport into a spin and then successfully recovered from uncontrolled falling.

Kvochur's Bell

The word 'bell' perfectly describes this aerobatic figure – the plane draws a bell's pendulum motion in the sky. First, the aircraft nose goes up at zero speed and then falls backwards down.

The maneuver first appeared as an aerobatic figure performed by propeller-driven aerobatic aircraft. Over the years, it had been believed that modern fighters were not capable of performing the 'bell' (tailslide). But in 1988, Anatoly Kvochur, a Soviet test pilot, was the first who flew the bell tailslide in MiG-29 at the Farnborough Airshow.



However, the maneuver actually has been put into practice using fighters – during a tailslide, the aircraft can be 'hidden' from radars and radar-guided missiles.

Pougachev's Cobra

To perform the cobra, the nose of the aircraft shall be pulled up suddenly at 110-180 degrees and then put back to the horizontal. The aircraft actually stands still vertically just like an attacking cobra and then drops back to normal flight. The air cobra appeared almost accidentally. Pilot Igor Volk, while testing Su-27, was faced with unstable behavior of a new aircraft at low altitude. According to the procedure, a pilot is to eject in such situation, but Volk made another decision. He took full control of the aircraft by overriding the automatic stabilization system. The maneuver with power augmentation showed that Su-27 did not enter a spin at post-stall angles of attack, but rather stood still like a cobra.

Igor Volk had never performed the cobra in front of an audience. Test pilot Victor Pougachev was the first

who made this at the Le Bourget Air Show in 1989. Moreover, the cobra performed by the Soviet pilot made the audience quite nervous – when Su-27 pulled up its nose, everybody thought that it was a crash. However, the aircraft completed the maneuver and easily kept on flying, and the figure has got the name 'Pougachev's Cobra' forever.

Frolov's chakra

An aerobatic maneuver and chakram, an Indian weapon, may seem to have nothing in common... As usual, this is only about a formal resemblance. Chakram is a throwing weapon in the form of a circle with a sharpened outer edge. Aerial 'chakra' (kulbit) is a maneuver when the aircraft rotates around its tail at a low speed making a loop.

'Chakra' is a comparatively young aerobatic figure. It was first demonstrated to the audience by Russian test pilot Evgeny Frolov using Su-37 at the Le Bourget Air Show in 1995. Similar to many other figures, the 'chakra' was named after its inventor – it is known as 'Frolov's chakra' today.

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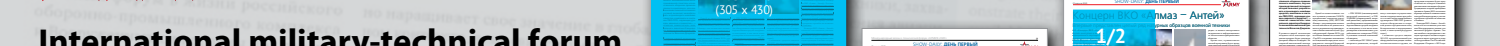
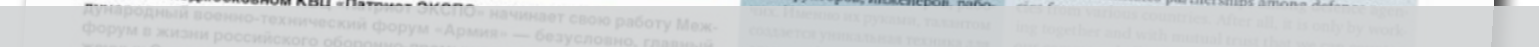
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