## RUSSIAN AVIATION MILITARY G U I D E

#### Special analytical export project of the United Industrial Publishing

#### № 03 (71), May 2023

**STATE APPROACH** Vladimir Putin on the basic MTC's principles and rules **FSMTC OF RUSSIA** Steady development of Russian defence export **ROSOBORONEXPORT** One of the leaders on the global arms market









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### Russia's Military-Technical Cooperation with Foreign Countries: 70 YEARS OF SUCCESS



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#### SAMS TOR-M2KM

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### **OFFICIAL GREETINGS**



#### The best offers for sky, space and land

This year, Russian defense exports are celebrating an important date: the 70th anniversary of the system of military-technical cooperation with foreign countries. It was the clear and well-thought-out system of military-technical cooperation created by the state that allowed the country to become one of the leading suppliers of weapons and military equipment to the world market

Enterprises of the Russian military-industrial complex create excellent advanced products, which are well known on all continents and contribute to maintaining a high defense capability of dozens and dozens of countries around the world.

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

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

In times like these the market of defense is undoubtedly growing. However, the dependence on the sellers of weapons and defense systems increases along with the defense technologies growth. It becomes extremely important to get products that would not fail you in a complicated situation.

Global history shows that quality and capabilities are what really matter and the number of weapons and military technics are not as significant, because quality and capabilities of every single one of them are exactly what leads to victory.

Other significant factor is technological independence from seller. Modern technologies make it possible to shut down any device from any place of the globe if you have appropriate access. With hi-tech products, solid aftersales service and proven reliability, Russia is honest and friendly partner for all countries, which are ready for mutual work.

All these years Russia demonstrates the policy of open partnership with the other states. Russia has a wide military and security product line that meets all the needs and is ready to propose the best technologies and the best price offers.

#### **AIRCRAFT INVISIBILITY**

Ruselectronics holding has created prototypes of a brand-new material capable of absorbing broadband radio waves. Thanks to the metal-core glass filament base, the thin layered material may be used in aircraft components. Such design solution was offered for a stealth material for the first time. The radar-absorbing material production process included interconnection of several glass fabric layers. It is based on thin glass-insulated metal-core filaments. Due to its exceptional properties, the new material absorbs up to 95% of incident electromagnetic radiation from radars and considerably hinders aircraft detection using radar equipment. 'The modern military aircraft engineering has faced the issue of development of a radar-absorbing structural material long ago. The existing types of stealth aircraft coatings require regular restoration, while the lower-reflectivity fiberglass is maintenance-free. Our prototypes have already successfully passed the required factory tests." said Aleksev Dymovskikh, General Director of the Central Design Bureau of Radio Materials. The stealth material has been developed by the Central Design Bureau of Special Radio Materials for the manufacture of engine compressor blades – one of the most visible parts in RF band.

#### **DELIVERY OF TV CAMERAS**

Ruselectronics Holding has started deliveries of TV cameras for surveillance in poor visibility conditions. The devices can be used in drones, manned aircraft and ground-based surveillance systems. The new high-sensitivity equipment will extend the coverage range in poor visibility conditions by a factor of 2.5 and up to 20 km when laser illumination is used. Modular design of the device is a proprietary know-how patented by the developers. The camera design allows to reduce noise and increase the device resolution and detectable limit. Therefore, the device is able to identify items with high accuracy in conditions where human vision is almost helpless. Today, camera modifications with different resolutions and spectral ranges - ultraviolet, visible and infrared - are available. The TV camera designer - NRI Electron, Ruselectronics Holding - has started delivery of the new devices for Russian and foreign customers. 'The all-purpose TV camera was designed as a high performance product with improved detection range, ultra low temperature resistance, object identification capability in poor visibility and dusk conditions. The device may be used not only as part of modern unmanned tracking systems and high-precision video surveillance systems, but also in astronomy, medicine and robotics,' said Aleksey Vyaznikov, General Director of NRI Electron.

#### A Log-Range System

Ruselectronics Holding has completed the development of anti-drone system capable of suppressing drone control within up to 5 km. The equipment helps to suppress multiple channels simultaneously to ensure protection against attack of more than one UAV, including those flying from different directions.

New Serp-VS5 system developed by Vektor Research Institute, Ruselectronics holding, operates in five frequency bands – from 900Mhz to 5.8 GHz. This enables the system to be used not only against civil, but also special-purpose drones.

The equipment suppresses the drone control channel, breaks the operator link, disables the navigation equipment, disorients the drone and thwarts the flight mission. The system suppresses GPS, GLONASS and Beidou signals (in L1, L2 and L5 ranges) and also breaks drone control via Wi-Fi.

The system can 'see' drone intruders in a 360 degree sector on the horizontal axis. The function of viewing angle division into sectors with independent operation modes allows to use other drones, if necessary, when the system is



running, for example, for power transmission line or pipeline monitoring. Communication with the system control station is provided via Ethernet.

Vektor Research Institute has previously launched Serp-VS system with a range of 3 km in two frequency bands.

#### Abalon Bottom Station

Upon completion of sea test carried out last year, the Kalashnikov's Abalon seismoacoustic bottom system will be finally enhanced and ready for start of commercial production by the end of 2023.



Abalon station is a unique indigenous development composed of 100% Russian-made components.

'The station was designed from scratch using the Concern's proprietary hardware components,' says Igor Khodakovsky, Head of Experimental Electronics Production at Kalashnikov Concern. 'It helps to achieve much more accurate geological pattern and, thus, more accurate delimitation of raw hydrocarbon deposits and is able to operate at a depth down to 2 km.'

'The great majority of Russian seismic survey companies use only cable equipment with the share of cableless systems owned by domestic companies being small,' says Igor Khodakovsky. Some companies employ rented equipment for some projects (that are difficult to implement using cable systems owing to natural constraints), but this opportunity is becoming increasingly less available due to sanctions.

Abalon features in-house fully-integrated production, proprietary integrated circuits and discrete semi-conductors, precision isotope frequency standards as the basis for onboard time scale drivers, the use of latest generation multichip micromodules of in-house design and production.

#### **Antidrone Systems**

Ruselectronics holding has completed a trial run of Serp-VS drone suppression systems at a Russian fuel and energy facility. The devices installed at the oil company site have prevented drone intruders from appearing in a restricted area. Serp-VS is capable of operating remotely offline and protecting both mobile and fixed facilities.

Serp-VS developed by Vektor Research Institute, Ruselectronics holding, is capable of suppressing drone communication, control and navigation links.

The system can affect global positioning satellite system signals – GPS, GLONASS, Galileo and BeiDou – as well as 2.4GHz and 5.6GHz UAV control signals used in Wi-Fi networks. Drone suppression in 360° on a horizontal axis is one of Serp-VS advantag-

sector from -10° to 80°. Controlled sectoral suppression is also provided. Operating conditions in each of the four azimuth sectors are set independently.

The input power is up to 150W and the range is up to 3 km. Communication with the system control station is provided via Ethernet.

### INTERNATIONAL EXHIBITION OF ARM & MILITARY MACHINERY







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#### **ULTRA-RELIABLE RESONATORS**



Ruselectronics Holding has developed miniature surface transverse wave (STW) resonators. They feature improved thermal stability and extended frequency band. The products are used in radio receivers and help to improve sensitivity, interference immunity and energy performance of the equipment.

The new STW resonator family created by Omsk Scientific-Research Institute of Instrument Engineering, Ruselectronics Holding, is used in radio receiver reference generators to improve communication quality. Performance improvement is ensured by the frequency-band extension up to 1000 MHz.

STW resonators are totally enclosed in a 3  $mm \times 3 mm \times 1.2 mm$  housing made from highly thermally-stable piezo material. This allows to produce miniature reference generators capable of functioning in a temperature range from -60°C to 85°C.

STW resonator based generators are highquality, low-noise and have lower power consumption than traditional quartz crvstal-controlled generators.

'New miniature STW resonators are a development initiative of Omsk Scientific-Research Institute of Instrument Engineering. These components will form a basis for modernization of commercially produced generators and, thus, will help to improve the generator specifications, ensure import substitution and, eventually, technological independence of our products. Taking into account the current situation with radio component supplies from foreign countries, we are ready to increase the output of generators using our production capacities,' said Vladimir Berezovsky, General Director of ONIIP.

### **Cardiopulmonary Resuscitation**

Russian Research Center Applied Chemistry (GIPH) has developed a portable inhaler that helps to carry out cardiopulmonary resuscitation in field conditions and durina patient transportation. The device is designed to provide first aid to the persons injured in accidents, emergencies and combat operations.

The device consists of a chemical oxygen generator in a heatproof housing with a breathing mask. Inside the housing, there is a small-size generator (diameter 70mm, length 200mm) with a solid pure chemical oxygen source based on sodium chlorate. GIPH is the designer and sole manufacturer of aviation oxygen generators based on such source in Russia.

'The portable device designed by GIPH personnel allows to perform cardiopulmonary resuscitation where it can be hardly conceived of, for example, in an emergency or combat operations area. The generator as part of the inhaler weighs a little more than 700g and has a small housing. Moreover, the solid chemical source produces 120 liters of oxygen which is sufficient for breathing of one patient during 20 minutes. Together with other resuscitation procedures, such device can save a patient's life,' said



Oleg Evtushenko, Rostec's Executive Director. The product was developed on the basis of GIPH's commercially available oxygen generator which is used in the civil and military aviation emergency systems. In such devices, oxygen production method is based on thermocatalytic decomposition of a solid agent.

#### **Delivery above the Arctic Circle**

Rostec's drone system was the first in Russia to deliver mail in the Far North. Consignees living above the Arctic Circle received their mail thanks to the BAS-200 designed by Russian Helicopters holding engineers. The drone performed demonstration flights for Russian Post at low temperatures in Salekhard area.



'The BAS-200 test flights on the Yamal were Russia's first successful cargo carriage experience using heavy rotor drones in the Far North conditions. Actually, the BAS-200 was temporarily incorporated in the Russian Post operations and provided air carriage of mail above the Arctic Circle – from Salekhard to Labytnangi where it landed in a peripheral point. The flights were performed at 30 degrees below zero and the payload weight for each of the tests was equal to 10kg. This weight is not the limit for our UAV - Russian Helicopters continue improving the BAS-200 to expand its functionality,' said the representatives of Rostec's aircraft cluster.

'The BAS-200 has proved high performance of all systems in challenging natural, climatic and navigation environment, despite the extreme conditions, limited visibility and low temperatures. The flight rate was high – up to seven flights per day. The turnaround time was maximum 20 minutes and virtually did not exceed the time required for mail loading,' pointed out Oleg Gulyaev, Senior Deputy General Director of Russian Helicopters.

### The Airborne Radar Performance

**Obninsk Research and Production Enterprise Technologiya named after A.G. Romashin has** developed a new radar-transparent radome production technology for helicopter navigation systems. Thanks to the use of advanced quartz fabric composites, the airborne radar performance was improved by more than 10%.

navigation and prevention of collisions with ground and aerial objects. They are protected against external impacts by radomes, which shall have an aerodynam-

Airborne radars on civil helicopters are necessary for The radome designed by ORPE Technologiya is made from a guartz fabric composite. Therefore, it can better pass signals and consequently improves radar performance on helicopters and other low-speed aircraft. ic configuration, shall be robust and radar-transparent. 'The use of advanced materials in aircraft equipment fa-

cilitates significant performance improvement. When working on radar-transparent radome for airborne radars, Technologiya professionals used their experience in developing similar systems for high-speed aircraft. As a result, it was possible to improve the equipment performance by 10% and to reliably protect it against external impacts. We are now working out the opportunity to introduce this development into manufacturing of new Russian helicopters,' said Andrey Silkin, General Director of ORPE Technologiya.











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#### **IMPORT-SUBSTITUTING** ANTENNAS

Ruselectronics Holding has developed domestically-made equivalents of remote and builtin antennas for GPS and GLONASS global positioning systems. The equipment may be used both for commercial products and for special-purpose systems. Batch production of the new antennas is to be launched as early as this year. As part of the research and development initiative, engineers of Omsk Scientific-Research Institute of Instrument Engineering, Ruselectronics Holding, have designed the prototypes of antennas for GPS and GLONASS signal receipt. For this, passive radiator technology based on high-dielectric constant hightemperature ceramics was developed. The use of such radiators allowed to achieve the same dimensions and specifications as those of imported equivalent products. 'The use of new high-performance and general-circuit solutions enabled our young engineers to develop indigenous equipment which is highly competitive with the similar foreign products. In current situation, such developments are necessary to ensure technological sovereignty of the country. Batch production of new antennas is to be started in 2023,' pointed out Vladimir Berezovsky, General Director of Omsk Scientific-Research Institute of Instrument Engineering. The development was highly appreciated by the expert jury of the Hope of Russia youth contest held by the Russian Union of Research and Engineering Associations in terms of research and technological development priorities of the Russian Federation.

#### **NEW TYPES OF OPTICAL FIBERS**

Shvabe holding and a team of young researchers from Povolzhskiv State University of Telecommunications and Informatics (PSUTI, Samara) are working on joint projects for the development of new optical fiber classes. Materials providing reliable connection for telecommunication networking are used in high-tech optical devices, including guantum communications systems. A group of new unique microstructured optical fibers featuring induced chirality - longitudinal twisting - is one of key results of the intellectual cooperation between Shvabe and PSUTI. Such materials are used in various photonics and sensorics sectors. For example, in optical tweezers, fiber-optic sensors and optical vortex 'generators'. 'Now, optical fibers are rather extensively forcing out copper cables used before in remote metering, remote control and other common onboard and field data transfer network applications. The fiber is more light-weight, space-saving, immune to electromagnetic interference and, more importantly, has a considerably large bandwidth,' said Oleg Evtushenko, Rostec's Executive Director.

#### Ant Loaders

High-Precision Complexes Holding is increasing the production of Ant mini loaders. To satisfy the increased demand for commercial products, Kovrov Electromechanical Plant (JSC KEMZ) has upgraded the assembly and metal fabrication lines. The new equipment will allow to output up to 50 loaders per month.



An advanced painting and drying system has been commissioned and will help to prepare, paint, dry and deliver the products directly to the assembly conveyor. Moreover, large-

scale modernization was carried out at Rybinsk-based KEMZ subsidiary Raskat company, which supplies metal structures for the mini loaders. This included 20 new welding

stations, a new laser cutting system and gantry type CNC milling machine. 'Following the exit of foreign

manufacturers of construction. handling and other special-purpose machinery, the demand for domestically-made products has increased. The products of Kovrovbased machine builders are already guite well-known in Russia. Having small dimensions and good maneuverability, Ant loaders are as good as their larger equivalents in performance. Wide range of attachments allows to perform almost any tasks in municipal services, road industry, agriculture and civil engineering,' said Oleg Evtushenko, Rostec's Executive Director.

### **Tripled life of Landing Gear**

Kazan Aircraft Factory has obtained the approval from the Federal Air Transport Agency for the increase in the Ansat skid landing gear life. The number of allowable landings without landing gear replacement has tripled and reached 12,000. This will make the helicopter operation easier and reduce the maintenance service cost.

The certificate was issued after a test series of three landing gear specimens. The test fully simulated the helicopter landing gear load during landing. The test covered not only the landing gear, but also the mounting hardware between the landing gear and fuselage structure. The mounting hardware life has been also extended.

Skid landing gear features easy and user-friendly operation compared with traditional wheeled configurations. It does not require any sophisticated maintenance and repair tools with in-service technical assessment performed using the available visual inspection methods. However, despite its simplicity, the skid landing gear needs thorough parametrization at the design stage because this is essential for takeoff and landing safety. It should be pointed out that earlier the life of the Ansat



tail boom and PTFE hoses used in hydraulic and fuel systems, engine and main rotor transmission lube oil systems has doubled from 4,000 to 8,000 hours. Their life has increased from 1,000 to 3,000 hours. The Ansat is a commercially available light two-

engine utility helicopter produced by Kazan Aircraft Factory. The rotorcraft design allows quick transformation into either cargo or passenger version. The helicopter has the most spacious passenger cabin in its class and can carry up to seven people.



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## Leading enterprise of Russian defense complex



Oleg Ratnikov, **General Director** of JSC Radiozavod. laureate of the Russian **Federation Government** Award in Science and Technology, given a Medal for Distinguished Service by the FSMTC

roducts of JSC Radiozavod tries.

has exported more than 800 articles

are exclusive at the market.

Automated control system 'Polyana-D4M1' is a backbone complex of multielement combat information system, designed for automated control of anti-aircraft systems and complexes.

mand post 'Ranzhir-M1' is designed for automated control of combat actions of AD anti-aircraft tinues to develop, to produce and to formations.

Mobile control post PU-12M7 is a command post designed for con- ding delivery geography and constanttrol automation of combat actions

Penza joint-stock company Radiozavod is a leading enterprise of Russian defense complex, a pace-maker in development and production of systems and complexes of forces and weapon control. JSC Radiozavod stands at the head of all enterprises that produce sophisticated military radio electronic articles in the sphere of Military-Technical Cooperation.

of AD anti-aircraft formations during air attack

In addition to production of special-purpose articles JSC Radiozavod arranges trainings of Customer specialists in operation and maintenance within the frames of Military-Technical Cooperation. Since 2006, more than 300 specialists have taken training courses at the enterprise. Specialists are supplied in 16 coun- training is arranged on the basis of the Radiozavod training center, on the Since 1976, the company Russian Federation fire-ranges as well as on a territory of a Customer. This approach allows getting skills in products Many of the exported products operation in the most effective way.

JSC Radiozavod actively participates in the biggest Russian and International exhibitions.

JSC Radiozavod is a permanent participant of the International Military-Technical Forum ARMY, International Defence Exhibition Unified mobile battery com- IDEX and International Aviation and Space Salon MAKS.

> Currently JSC Radiozavod conexport its products within the frames of Military-Technical Cooperation expanly improving its quality.

MILITARY-TECHNICAL FORUM "ARMY-2023"

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AND EXHIBITIONS

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# **15 NEW RUSSIAN-MADE MILITARY PRODUCTS**

Rosoboronexport (part of Rostec State Corporation) has added new Russian military products to its export catalog, expanding the range of weapons and military equipment promoted on the global market.

has launched a global marketing campaign for 15 new military products developed and manufactured in Russia. Its export catalog was replenished with products for the Air Force, termeasures. Market launch of new products significantly increases the competitiveness of Russian arms

country on the global market,' said Rosoboronexport Director General Alexander Mikheev.

ties are the Orlan-30 UAV, Ballista remote-controlled weapon station module, Chukavin sniper rifle, UAV countermeasures systems, new underwater weapons, communica-

2022, Rosoboronexport tions equipment, training simulators, visible or infrared range. In addition, motor and armored vehicles.

KALASHNIKOV

New Russian equipment and weapons for which export permits have been issued will be presented by Rosoboronexport at international defense exhibitions, during meetings and negotiations with partners, and Navy, Ground Forces, Air Defense on fast-growing digital platforms. Forces as well as with UAV coun- The company has agreements with most manufacturers to jointly promote products in foreign markets.

The Orlan-30 unmanned aerial and strengthens the position of our vehicle system developed and manufactured by the Special Technology Center is a further evolution of the Orlan-10 UAV, which Among the long-awaited novel- is well known in the world market and has proved its capabilities in real combat conditions.

The Orlan-30 is intended for aerial reconnaissance, search, detection and recognition of objects in the

when equipped with a mission payload, it provides target designation for precision-guided weapons for destroying fixed and moving targets day and at night.

The Ballista remote-controlled weapon station is designed for mounting on armored personnel carriers. It is equipped with a 30-mm automatic cannon and a coaxial 7.62mm machine gun as well as with two ATGMs. The station is fitted with a combined sight with a TV camera, thermal imager and laser rangefinder capable of detecting and identifying targets day and night. In addition, the Ballista is equipped with a backup sight, which significantly increases its combat capabilities.

Besides, the promotion of the BMP-3 infantry fighting vehicle (IFV) with a new remote-controlled



weapon station, developed by High Precision Systems holding company, has begun. The vehicle was unveiled as part of Rostec's exhibit at the Army 2022 International Military and Technical Forum.

100-mm gun/launcher, a 30-mm automatic cannon and a 7.62-mm machine gun. Owing to its power- procedures for launching new prodful armament, the IFV is capable of ucts in the world market. Legislative providing fire support to infantry, initiatives that optimize working including afloat, effectively engaging manpower, lightly armored targets export documentation, were considlike IFVs and APCs, tanks and other targets with enhanced protection, as Committee for the Development of well as low-speed air targets, includ- Foreign Trade Activities in relation to ing helicopters.

new drone countermeasures to its of Deputy Chairman of the Russian export catalog. Among others is the RB-504P-E electronic warfare system, which provides highly effective detection, identification, and direction finding of UAVs, as well as jamming of their navigation and control links.

Rosoboronexport has started promoting modern simulators developed by Rostec's subsidiaries for training the crews of the IL-78MK-90A tanker aircraft and the IL-76MD-90A(E) military transport aircraft. In addition, the company got the opportunity to offer foreign partners a new automated artillery fire control system, a radio signal monitoring system, a heliborne ground surveillance radar system, K-5350 motor vehicle with a protected cabin, Podlet-K1KE radar station, communications equipment and small arms.

'In 2022, thanks to comprehensive support of the President and the

Government of the country, as well as the active work of Rosoboronexport within the framework of the Russian Engineering Union's activities to improve legislation, a number of changes were made to the regula-The vehicle is equipped with a tory and legal framework in the field of military-technical cooperation, which have simplified the licensing processes, including when executing ered during meetings of the REU's military products,' added Alexander In 2022, Rosoboronexport added Mikheev, who holds the position Engineering Union.



#### 70 YEARS OF SUCCESS



# **BASIC RUSSIAN PRINCIPLES, GOALS AND RULES OF MTC**

This year, Russian defense exports are celebrating an important date: the 70th anniversary of the system of military-technical cooperation (MTC) with foreign countries. It was the clear and well-thought-out system of military-technical cooperation created by the state that allowed the country to become one of the leading suppliers of weapons and military equipment to the world market. All issues connected with military-technical cooperation between the Russian Federation and foreign states are the exclusive purview of government bodies of the Russian Federation. The goals of the state policy in the field of military technical cooperation and the main spheres of activities formalised in the military technical cooperation strategy. All decisions on deliveries of military products to foreign customers, as well as on other issues of foreign trade related to military products, are the responsibility of the President of the Russian Federation and the Government of the Russian Federation. It is the leader of the country who determines the strategy, tactics and principles of implementation of such complex military-technical relations with other countries.

Federation Vladimir Putin regularly holds meetings on the development of military-technical cooperation. The key state structure that determines the development strat- further development of MTC with egy of MTC is the Commission for Military Technical Cooperation with ings Vladimir Putin outlines the Foreign States under the leader- main topics, goals, principles, and

hePresident of the Russian ship of the President of Russia. At the meetings of the Commission on Military-Technical Cooperation with Foreign Countries there are discussions of the results of work in the field of MTC and plans for the key partners. At these same meet- many years. The overall portfolio of

prospective areas of development of military and technical cooperation between Russia and foreign countries. For example, at one such meeting Vladimir Putin noted: 'Financial indicators of military technical exports have been growing for contracts reached almost \$54 billion, hitting an all-time high. Russia

confidently takes second place on the global arms market.

Speaking of our tasks, I would like to note that the streamlining of financial, economic, organisational and other mechanisms of military technical cooperation is our key objective.

Apart from arms exports, including those of the most advanced models, we need to more actively upgrade previously delivered equipment, set up service centres on the territory of customer states, and reduce repair-service deadlines.

It is important to expand the successful cooperation experience in the field of manufacturing arms and military equipment. We need to continue implementing joint R&D projects and transferring Russian technology to customers wherever this meets mutual interests. We realise that many of our partners are seriously interested in this. We need to pay more attention to our partners' wishes to establish their own defence industry.

matters linked with strengthening the military technical potential of the Collective Security Treaty Organisation and helping its member countries to strengthen their defence capability require high-priority attention.

complicating our work with partners in the military technical cooperation sphere, including a tougher competition struggle and the increasingly The ability to work even in the face of political provocations and economic sabotage highlights the strengths of the Russian system of military technical cooperation, its sustainability and enormous potential.

It goes without saying that aggressive use of sanctions, plus we need to respond adequately to them. Therefore, a new military technical cooperation strategy stipulating well-coordinated political and diplomatic, financial economic and technical measures has been drafted in order to organise our entire activi-We need to consider new factors ties in the field of military technical cooperation with foreign states more effectively.

> We have to do everything possible to preserve Russia's leading



#### 70 YEARS OF SUCCESS



positions on the global arms market. I suggest that we conduct a detailed discussion of this document today in precisely this context and specify various priorities and guidelines of further expanding military technical cooperation with foreign states.'

Despite difficult times and unprecedented sanctions from a number of Western countries, according to Vladimir Putin, Russia has managed to maintain and develop its positions on the global arms market. 'Russia has not only preserved but also strengthened its leading position on the global arms market, primarily in the high-tech sector, amid tough competition, - said President of Russia. - Relying on our rich experience in this sphere, we must continue to consistently build up our military technology cooperation with foreign states.

Undoubtedly, Russia's successes in the sphere of military-technical cooperation rely primarily on the achievements of developers and manufacturers of defence products.

'Russian manufacturers have the advantage of an unfailingly high quality of products, which have no analogue in their combat and tech-



Russia will continue to actively pursue military technical cooperation with all interested nations, including in the most high-tech segments in all classes of weapons – air force, counter-air defence, ground forces, navy and others.

> nical characteristics, – said Vladimir Putin. – Russia values its reputation of being a conscientious and responsible participant in military technology cooperation. We strictly observe international norms and principles in this area. We supply weapons and military equipment solely in the interests of security, defence and

anti-terrorism efforts. In each case, we thoroughly assess the situation and try to predict the developments in the specific region. No bilateral contracts are ever targeted against third countries, against their security interests.

Vladimir Putin marks: 'I would like to thank the managers and person-



nel of our defence enterprises, all those who work on military technical cooperation, for the results that have been achieved. This success means even more considering the tough, uncompetitive conditions Russian enterprises are forced to operate under.

The ability to work even in the face of political provocations and economic sabotage highlights the strengths of the Russian system of military technical cooperation, its sustainability and enormous potential. These are the judgments of current and potential buyers of Russian arms and military equipment. The geographic reach of our military technical cooperation is constantly expanding, with the number of partners already in excess of 100 nations.'

The Russian MTC policy is aimed at the confident development and improvement of all mechanisms of interaction with partner states. Vladimir Putin emphasizes: 'We will certainly continue to closely follow the trends of the global arms market, to offer our partners new flexible and convenient forms of cooperation. This is all the more important in the current conditions, when our competitors often resort to unfair methods such as putting pressure on or blackmailing customers, also through the use of political sanctions, so as to force them to buy their military equipment, even though it is more expensive and inferior to our products in quality.

A new factor is the growing interest from foreign customers in modern research and development and design projects, as well as in setting up military products manufacturing at home. We certainly try to consider their needs. Over the past five years, the volume of joint R&D projects to upgrade or develop new types of weapons has increased by 35 percent.

At the same time, the changing conditions in which we have to trade in military equipment require some adjustment of existing approaches and development of a new integrated strategy for the foreseeable future. In a word, in military technology cooperation, we have both serious Russia has not only preserved but also strengthened its leading position on the global arms market, primarily in the hightech sector, amid tough competition.

achievements and an understanding above the interests of global security. of the large tasks facing us.' We have a time-tested reputation

Vladimir Putin notes, 'our capabilities in the military technical sphere must be used to modernise and upgrade all our industries, to support our science and to create a powerful technological potential for the country's dynamic development'.

Russia is looking confidently into the future, continuing to actively develop both technological and marketing mechanisms MTC, while relying on the basic principles of its national policy. 'The experience of modern warfare and conflicts shows that neglecting the means of defending the sovereignty of the state and the security of the people is unacceptable, - said Vladimir Putin. -Russia will continue to actively pursue military technical cooperation with all interested nations, including in the most high-tech segments in all classes of weapons - air force, counter-air defence, ground forces, navy and others. But let me emphasise that we have never placed and will never place commercial profit

above the interests of global security. We have a time-tested reputation as an honest, upstanding business partner who always strictly honors contractual and international legal obligations.

Timely maintenance and good repairs are among the key parameters of the competitiveness of military products. We never stop talking about this. We should stay close to the client and redouble efforts to increase the number of maintenance service centres in the clients' countries. But we must also consider a new field – the establishment of joint ventures to produce spares for our equipment abroad. It is an extremely important sphere, which calls for expanding the rights of parties to military technical cooperation and

The changing conditions in which we have to trade in military equipment require some adjustment of existing approaches and development of a new integrated strategy for the future.



amending the legal framework correspondingly.

At the same time, we undera stand how difficult the working nt conditions are for Russian exportur ers today. However, even under ly these conditions, Russia continues to develop and promote its defense products and improve military-technical cooperation'.



# **RUSSIA AND CHINA: IN THE FIELD OF MTC**

In April in the Moscow Kremlin Vladimir Putin held a meeting with State Councillor and Minister of National Defence of the People's Republic of China Li Shangfu. Russian Minister of Defence Sergei Shoigu also attended the meeting. During the meeting there were topics on Military-Technical Cooperation between two famous countries.

this meeting President of Russia Vladimir Putin said: 'Comrade Minister, I am delighted to see you. You have arrived

in Russia following the visit to our country by our great friend, my friend President of the People's Republic of China, Comrade Xi Jinping. I would like to emphasise once again that this was a very productive visit. Of course, we discussed military-to-military cooperation, among other topics.

Our two countries have maintained positive momentum in expanding our economic, social, cultural and educational ties. We have also been proactive in our military-to-military relations by regularly sharing actionable insights and cooperating on defence matters. We also hold joint military exercises in



ing in the Far East, Europe, at sea, on land, as well as in the air. I do believe that this constitutes a major track for strengthening the trust-based strategic relationship between the Russian Federation and the People's Republic Shangfu said: 'Mr President! Thank of China

We are glad to see you. I know various theatres of operation, includ- that you have a packed and quite

extensive programme for your visit. I am certain that your visit will be very effective?

Minister of National Defence of the People's Republic of China Li you so much for finding the time to have this meeting with me. I know that today is a holiday, but still you

This is a great honour for me.

you the warmest greetings and the best wishes on behalf of Chinese President Xi Jinping.

In 2017, a military delegation future cooperation. visited Russia to take part in the meeting of the Commission for Military-Technical Cooperation, and I was a member of this delegation at the time. Today, I am back in Russia, which gives me great joy.

have found the time to receive me. ing President of China. Ten years on, he arrived in Russia again on his first First of all, allow me to convey to foreign visit after being re-elected head of the Chinese state. The talks you held had a very packed agenda and charted the main areas of our

> We have a very strong relationship that goes beyond the Cold War-era military and political alliances. This relationship hinges on the principles of non-alignment and non-confrontation with third parties, and these



As of late, military and military-principles are very stable. Under your technical cooperation between Russia and China is developing very well. This is making a major contribution to maintaining global and regional security.

I have arrived in Russia today. There are plans to implement your agreements with President of China Xi Jinping, reached during his March visit to Moscow. This is my first foreign visit after I became Defence Minister of China. I specially chose Russia, so as to emphasise the special nature and strategic significance of our bilateral relations.

Our countries established bilateral relations over 70 years ago. Relations between our armed forces are growing stronger with every passing day. Naturally, the diplomacy of leaders plays a key role here. You set strategic goals for our development. In addition, your personal friendship with the President of China plays a major role in this process, and everyone in China knows this.

According to our estimates, you have held 40 meetings with the President of China. In 2013, he visited Russia for the first time after becomstrategic leadership and that of the President of China, we are actively developing cooperation in practical spheres. Our relations have already entered a new era

For 13 years, China has been Russia's main trade partner. While developing our relations, we realise



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the tremendous responsibility assumed by our states, especially in light of the fact that we are now seeing the most profound changes of the past 100 years. We are standing shoulder to shoulder and working to improve the wellbeing of our people. We are also mindful of the fact that the global economy is recovering very slowly, and that there is great demand for peace and peaceful relations between countries.

Mr Xi Jinping has advanced several major initiatives, including a civilisational initiative that has to do with global development. To the best of our knowledge, the Russian side has a positive opinion of these initiatives. Cooperation continues to develop at all levels, and we will continue this cooperation in the interests of the entire world's development and prosperity. /RA&MG

# FSMTC OF RUSSIA

**Dmitry Shugaev:** 'Throughout a long period of time, the Soviet and, after that, the Russian system of military-technical cooperation has systematically strengthened its global credibility both as a reliable partner and supplier of military products'

> In accordance with the law of the Russian Federation, activities in the field of Military-Technical Cooperation (MTC) with foreign countries shall be controlled and supervised by the Federal Service for Military-Technical Cooperation (FSMTC of Russia) that, among other things, shall ensure implementation of basic principles of the Russian government policy in the field of MTC. Dmitry Evgenyevich Shugaev, FSMTC of Russia Director discusses main directions and tendencies in development of military-technical cooperation between the Russian Federation and foreign countries, the peculiarities of Russian military purpose product exporters' activities at the present stage in his interview to our magazine.

- Mister Shugaev, this year Russia countries. In your opinion, what interests while strictly observing this area have ensured and ensure the very first day when the system the steady success of our country?

- The principle of state policy in celebrates 70 years of military- the field of military-technical cooptechnical cooperation with foreign eration – the priority of Russia's historical features in the develop- international norms and obligations ment of Russian cooperation in has remained unchanged since of state management of military-

technical cooperation between the Russian Federation and foreign countries was established. It is considered to be 8 May 1953, when the Main Engineering Directorate was created under the Ministry of Internal and Foreign Trade, which supplied military equipment to foreign countries.

In the 1960s, the USSR firmly established itself as one of the world's leading exporters of military equipment. Deliveries became complex and multifaceted, their mechanism was formed, the criteria of priority and reliability of partners were determined, as were the main competitors on the world arms market: the USA, England and France.

In the 1970s, the Soviet Union significantly expanded the scope of its military-technical cooperation with allied countries within the socialist bloc. The states of Eastern Europe were given licenses to produce some samples of military equipment, which they were allowed to sell to 'third' countries.

In the early 1990s, Russian military industry and exports of military products were faced with a number of problems. In these circumstances, there was an urgent need to change the existing system of military-technical cooperation.

It was decided to fundamentally reform the system of military-technical cooperation by building a 'presidential vertical of power'. A single state intermediary for the export of the entire range of finished products, Rosoboronexport, was created, as well as the Russian Federation Committee for Military-Technical Cooperation with Foreign States (now the Federal Service For Military-Technical Cooperation of Russia), which exercises state control and oversight in this area.

The reform of Russia's militarytechnical cooperation system has made it possible to reverse negative trends and move towards increasing both the volume and the quality of Russian defence exports.

The structure of Russia's modern system of military-technical cooperation established in the early 2000s has shown its resilience in the most critical situations, as it is able to respond in a timely manner to changes in the world and to function effectively in adverse conditions.

Today, our country cooperates states. Export deliveries of military with more than 100 countries, and its export order book has remained at \$50-55 billion over the past few years.

- In your estimation, how sig- fundamentally changed the situation nificant is the contribution of the



USSR and Russia to global stability and balance in the world? To what extent do the defence technologies of the USSR and Russia make the countries of the world - our partners - feel more confident. reliable and secure?

Union's economy was its complete focus on military production. Foreign policy was based on spreading Soviet influence in all regions of the world. At the same time, supplies of military products, assistance to friendly countries in developing their military industry, and the transfer of licenses for the production of Russian military equipment had an absolute advantage in building relations with allied equipment had absolute state support

The collapse of the Soviet Union in the international arms market. The

#### 70 YEARS OF SUCCESS



'The principle of state policy in the field of militarytechnical cooperation - the priority of Russia's interests while strictly observing international norms and obligations – has remained unchanged since the very first day when the system of state management of militarytechnical cooperation between the Russian Federation and foreign countries was established."

- The main feature of the Soviet

exit of a major exporter cleared the way for the world's major suppliers of military products to increase exports and allowed new arms manufactur ers to enter the market. As a conseguence, competition intensified, the range of products offered increased and 'dirty' methods of competition began to be used more frequently.

Russia found itself in a situation where it was necessary to practically rebuild the entire state system from scratch, which required considerable financial cost. The old methods of state-building did not fit, everything was starting from scratch.

Today, our main principles of interaction with foreign partners are mutual respect, readiness to consider their interests and the absence of politically motivated claims. It is a reasonable ratio between the price and quality of the products supplied; and finally, it is the tactical and technical characteristics of our military



equipment. It is also important that we are reliable and responsible suppliers.

Russian manufacturers are ready to offer potential buyers modern military equipment that meet all requirements and are traditionally renowned by their foreign partners for their reliability in operation, unpretentiousness to They are: mutual respect and coop-

#### technical cooperation with foreign countries today?

- As you know, military-technical cooperation is one of the components of the foreign policy pursued by our state. The main principles of our foreign policy remain the same for military-technical cooperation.

#### 'The structure of Russia's modern system of militarytechnical cooperation established in the early 2000s has shown its resilience in the most critical situations, as it is able to respond in a timely manner to changes in the world and to function effectively in adverse conditions."



weather and climatic conditions, and high maintainability. This has repeatedly been proven by its successful use in real-world combat conditions. Moreover, the design and technological deficiencies identified during combat use are eliminated during the production of new models. Thus the main feature of military equipment its combat effectiveness - is significantly improved. As a result, more and more countries are showing interest in purchasing our products. This means that the list of our partners in the field of military-technical cooperation has good prospects for growth.

- What do you think are the main principles of Russia's militaryeration on the basis of equal rights, non-interference in the internal affairs of other states, compliance with international laws and commitments. Naturally, at the same time we are against the use of threats, blackmail, coercion, use of force and any kind of restrictions in international relations.

All of the above allows us to build cooperation not only with states that share the views and foreign policy of the Russian Federation, but also with countries that are under serious Western influence

- In your opinion, why does Russia confidently maintain its leading positions in the world mar-

#### ket of weapons, security equipment and systems?

- Indeed, over the past several years the Russian Federation has been confidently holding the leading positions in the world arms market. This is due to the fact, that all parts of a well-functioning system professionally work together within the military-technical cooperation between the Russian Federation and foreign countries.

Specifically, when our foreign partners make contracts with Russian suppliers for the purchase of military products, they understand that they will get high end equipment that meets their needs and has the characteristics of the world's best models, tested in real-world combat conditions. Besides, Russian suppliers are always ready to discuss any issues within the framework of contract performance.

Of course, foreign customers of Russian military products planning to develop military-technical cooperation with Russian Federation, along with other factors, also take into account our historical background, and see us as a reliable supplier capable of providing its partners with top level products.

- What makes Russia's commitment consistent and reliable? What are Russia's unconditional advantages as a military-technical partner?

- Certainly, Russia is willing to honor the wishes of foreign customers to the maximum extent possible, as long as this does not pose a threat to national security.

We make no political nor legal demands, except as set forth in recognized international instruments.

Furthermore, our commitments to protect the interests of our partners remain strong, especially in the context of the US illegal anti-Russian sanctions policy and Washington's cross-border approach to the Countering America's Adversaries through Sanctions Act.

For the sake of the common interest, we use alternative payment solutions for the products delivered and increasingly use national currencies for payments. It is imperative that we take into account the requirements



of the national legislation of foreign customers.

Traditionally, we offer high-end weapons products on the international market with characteristics comparable to, and in some cases surpassing, those of their foreign peers, including in terms of priceperformance ratio.

We are committed to preventing delays in the delivery of purchased equipment. We are actively developing an after-sales service system for previously supplied equipment, arranging licensed production and cooperating in high-tech areas.

Overall, throughout a long period of time, the Soviet and, after that, the Russian system of military-technical cooperation has systematically strengthened its global credibility both as a reliable partner and supplier of military products. And now, in the face of unprecedented sanctions pressure, we continue to honestly and efficiently carry out the work entrusted to us - to develop military and technical co-operation with foreign countries.

- What allows Russia to overcome unparalleled pressure by Western countries, as well as sophisticated technologies of unfair competition?

 Now we live in a world that faces a transition from unipolarity to multipolarity. Washington with the desire to maintain its global hegemony is increasingly using illegal methods of coercion in international relations in the form of direct blackmail and various kinds of sanctions, including

threats of the use of military force. All this does not make the US any more popular in the international field. The introduction of sanctions against any state always has a more or less negative impact on the global economy. When powerful global players such as China and Russia are involved in

'Today, our main principles of interaction with foreign partners are mutual respect, readiness to consider their interests and the absence of politically motivated claims. It is a reasonable ratio between the price and quality of the products supplied; and finally, it is the tactical and technical characteristics of our military equipment. It is also important that we are reliable and responsible suppliers.'



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'Today, our country cooperates with more than 100 countries, and its export order book has remained at \$50-55 billion over the past few years.'

es of the confrontation can be verv unforeseeable.

Most of the world community understands this. This is evidenced by the failure of U.S. plans to isolate Russia internationally, as most of the world does not support the policy of sanctions pressure by the United States and its allies directed against the Russian Federation.

Convinced of the ineffectiveness of economic and political sanctions. Washington and its supporters began to use blatantly terrorist methods.

As propagandistic anti-Russian outbursts, there is a bloat on the issue of 'Russia's readiness to use tactical the sanctions war, the consequenc- nuclear weapons' in a special mili-

'Russian manufacturers are ready to offer potential buyers modern military equipment that meet all requirements and are traditionally renowned by their foreign partners for their reliability in operation, unpretentiousness to weather and climatic conditions, and high maintainability."



Unfortunately, we cannot expect the situation to change any time soon, so our system of military-technical cooperation, which has been under Western sanctions pressure for many years, is systematically improving working methods to successfully counter the restrictions imposed on it.

We have achieved good results in this direction: alternative schemes of mutual settlements are introduced, the system of insurance of international freight transportation is improved, and the interests of our partners are protected.

International economic organizations are being created at the state level, the financial policy of which provides for the rejection of the U.S. dollar. And more and more countries are striving to join them.

Our world is being reshaped; a new world order is being established. In order to strengthen Russia's international standing, its political position and national

tary operation, among other things. security, we, the employees of the Russian Federation's system of military and technical cooperation with foreign states, are also rearranging ourselves.

> - How ready is Russia to talk about setting up military equip-

ment production in other countries?

 Despite the fact that, traditionally, deliveries of final products to foreign customers still dominate the share of exports, each year there is an increasing tendency for foreign partners to become more and more interested in implementing joint projects.

Today the Russian side is ready to talk about setting up military equipment production in the territory of partner countries. We strive for more active introduction of modern forms of cooperation that can bring the process of our interaction to a higher level. This includes, first and foremost, the joint development of high-tech military products, the establishment of joint ventures for the production of military products, the construction of service centers to maintain the products supplied, and mutually beneficial research and development work in relation to military products.

Many countries are interested in establishing the production of Russian military equipment on their territory. Russia, in turn, is fully prepared to provide these countries with everything they need to meet this goal

One of the best known examples of such cooperation is India, where the BrahMos project, licensed production of T-90S tanks, Su-30MKI aircraft, aircraft engines and Mango tank projectiles have been implemented, and frigates of project 11356 are being built at Indian shipyards.



To date, it can already be said that a project for the joint production of AK-203 assault rifles has taken place, and at the beginning of this year their mass production was launched in India.

Among the promising projects, we can single out the joint production of Ka-226T helicopters and Igla-S portable anti-aircraft systems.

Another example is Vietnam, where joint ventures and service technical centers have been and continue to be set up to maintain different types of ships and their control systems, as well as to repair aircraft.

- One of the traditional regions of active military-technical cooperation between the USSR and Russia is Southeast Asia, the Asia-Pacific region in general, and the ASEAN countries in particular. What is the special nature of Russia's militarytechnical cooperation with the region and ASEAN countries?

 In the current geostrategic conjuncture, it is Russia that is perceived by the states of Southeast Asia and Asia Pacific, which do not want to be excessively drawn into the orbit of American influence, as the most acceptable partner, the prospect of cooperation with which is associated with the least risk. Russia pursues a policy of multi-vector partnership and does not set categorical conditions in the field of military-technical cooperation.

In general, relations between the USSR/Russia and the ASEAN member countries are developing on goodneighborly and mutually beneficial terms. All countries maintain an active dialogue with the Russian side both on military-technical cooperation issues and on military, economic and political topics.

Since July 1996, Russia has been a full partner for dialogue with ASEAN. During this period, a legal and regulatory framework for cooperation has been established. Key bodies include the Joint Cooperation Committee, the Joint Planning and Management Committee (Dialogue Partnership Financial Fund), the Working Group on Trade and Economic Cooperation and the Working Group on Technological Cooperation.



# good prospects for growth.'

- In your opinion, what primarily characterizes the current stage in the development of military-technical relations between Russia and the Southeast Asian countries?

- The current stage in the development of military-technical cooperation relations is primarily characterized by strong opposition and attempts by some Western countries to influence the current relations, both politically and economically. However, despite all the difficulties, it also opens up new opportunities: serious steps have been taken in the issue of settlements in national or alternative currencies, and the development of closer cooperation and the creation of joint productions are also strengthening.

- What types of Russian military equipment are traditionally of high interest to the ASEAN countries? Which of them are the most relevant today and promising in the development of the partnership?

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'More and more countries are showing interest in purchasing our products. This means that the list of our partners in the field of military-technical cooperation has

- Aircraft and air defence equipment have traditionally been the flagship of the Russian military products offered for export. Most countries are operators of Russian combat aircraft and helicopters, and also show an ongoing interest in both existing and prospective models. Some countries are modernising Russian equipment in service.

The basic principles for developing military-technical cooperation with all countries are and should remain openness, mutually beneficial terms and strict compliance with the terms of contracts and existing regulations.

Due to the economic and political strengthening of this region and the good neighborly relations of most countries with the Russian Federation, we can give a very optimistic forecast of the development of the military-technical cooperation with the countries of Southeast Asia and the Asia-Pacific region, especially with the ASEAN countries. /RA&MG/

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## ONE OF THE LEADERS ON THE GLOBAL ARMS MARKET

**Alexander Mikheev:** 'Rosoboronexport has worked all over the world. The total geography of deliveries during the company's history is more than 100 countries'

Joint-Stock Company Rosoboronexport is Russia's only state-controlled intermediary in the area of exports and imports of the entire range of military and double-purpose products, technologies and services. The Company is actively involved in pursuing national policy of the Russian Federation in the area of military technical cooperation with foreign countries. The official status of exclusive state-controlled special exporter provides Rosoboronexport with unique opportunities of enlarging a long-term mutually beneficial collaboration with international partners, of strengthening Russia's leadership in the global arms market.

In its activities, Rosoboronexport supports implementation of large-scale projects aimed at the improvement of defense capacity of partner countries, and at comprehensive consolidation and innovative development of enterprises and entities of Russia's MIC. Alexander Mikheev Director General of JSC Rosoboronexport talks about the company's successes and objectives in an exclusive interview for the 'Russian Aviation & Military Guide' magazine.

- Mister Mikheev, this year marks the 70th anniversary of Russia's system of military-technical cooperation with foreign nations. In your opinion what are the core features of the Russian system of military and technical cooperation? What principles underpin it and have made the Russian model of MTC one of the most effective in the world?

– Russia's system of militarytechnical cooperation with foreign nations has gone through several key milestones of development over 70 years. In a short historical period, our country has acquired the status of a major power with great militarytechnical capabilities and become one of the largest exporters of modern weapons and military equipment, an important partner in technological cooperation.

Military-technical cooperation coordinated and administered by the President of the Russian Federation is an important foreign policy tool that effectively helps to promote the state's interests in all strategically important regions of the globe.

Russia's system of military-technical cooperation, which has become a highly effective mechanism is now a dynamic living network that adopted rapidly and effectively to changes in geopolitical and scientific-technical realities. Its effectiveness and viability is based on many years of experience and the continuation of several generations of professionals.

- Rosoboronexport that was established over 20 years ago plays an absolutely unique role in Russia's military-technical cooperation system. What tasks were set for the company at the origin? How successfully did Rosoboronexport fulfil them and does it fulfil them today?

 In 2000 Russian arms supplies to the world market were carried out by several state intermediaries and a number of competing manufacturers.

Thus there were systemic threats: dumping, uncontrolled leakages of technology resulting in budget losses, further collapse of the defense industry and a decline in the credibility of Russian arms and Russia itself as a partner. The strategic interests



'If we talk about the entire period of Rosoboronexport's history, I would first of all mention that we hold one of the top rating in the global arms market, the high credibility of a reliable and strong partner among customers and the timely implementation of the tasks assigned by the President of the Russian Federation, who is at the top of the militarytechnical cooperation vertical.'

of the state were affected. Then the President decided to restore order to Russian arms exports and ensure a state monopoly on military-technical cooperation.

Rosoboronexport was established as the backbone of the effective presidential vertical. The company was entitled to export all the final product samples designed for military applications. The imbalance in the system was redressed quite rapidly.

It did not take long to see the result. Rosoboronexport's volume of deliveries almost doubled in the first five years, tripled in ten and are now growing fivefold. We have been rapid to explore new or lost markets and to cultivate inter-state relationship.

- What can be said about Rosoboronexport's current image and order book? How this portfolio changes? What are the new components in it and what are the reliable time-tested classics?

 Rosoboronexport has become one of the leaders on the international arms market for two decades and

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has contributed greatly in promoting the products of domestic enterprises, incorporated in the Rostec State Corporation as well. Todays company's order book is maintained at a stable high level. The level of expertise, focused attitude towards trends and customer needs demonstrated over the years undoubtedly indicate good prospects for the company in terms of expanding the geography of sales and deepening cooperation with partners.

One of the main tasks of Rosoboronexport is to introduce the latest high-tech weaponry and military equipment to the global arms market.

In addition to exporting final product samples for the armed forces, Rosoboronexport has successfully extended its foreign trade experience to technological partnership, construction of infrastructure facilities on foreign customers' premises, provision of space services and training of foreign experts in the operation of Russian products.



'First and foremost it is a confidence between parties. It is the cornerstone for all relationships but in the field of military-technical cooperation – a rather sensitive domain of inter-state relationships – it is of particular value.'

> A noval and promising area for Rosoboronexport has become the promotion of dual-use and civilian products to foreign markets. The company has extensive experience in comprehensively organising supplies of engineering, firefighting and other specialised equipment. Today the state special exporter also supplies civilian and service weapons and is examples in recent times. activly working on the markets for high-tech security equipment, medical equipment, hospitals, and special equipment for the needs of public beneficial to each side. and private sectors.

technical cooperation do you consider most important?

- First and foremost it is a confidence between parties. It is the cornerstone for all relationships but in the field of military-technical cooperation - a rather sensitive domain of inter-state relationships – it is of **Rosoboronexport's supply chart in** particular value.

We sign contracts with partners by covering all small details. They are based on intergovernmental agree-

ments. However without mutual confidence in the present context a normal cooperation is hardly pos- and ally. sible. When there is no assurance that a partner in order to gain profit will infringe upon the commitments undertaken, no one could ever come to an agreement. Unfortunately we have seen a number of such negative

The second but no less important principle of MTC is mutual profitability. The partnership should be

Naturally it is attention to every - What principles of military- partner. Today any customer is strategically important to us. It does not matter whether it is a big deal or a large order: we fight for and always appreciate our partners request from any country if they are interested in our product development.

#### - How can you describe general terms?

- Rosoboronexport works all over the world. The total geography of deliveries during the company's history is more than 100 countries. In this respect, it is important that we have had long-term contracts. It was not only exports of Russian military equipment and armaments - there were licensed productions, joint maintenance ventures, projects with coordinated design, new samples engineering and manufacturing installation directly at our partners.

Our work is focused on cooperation with countries friendly to Russia and they are the majority in the world. We work very closely with the Asia-Pacific region and Latin America. There is great interest in Russian weapons from the Middle East, the CIS and members of the Collective Security Treaty Organisation

Separately I would like to mention the nations of Africa, both North and Sub-Saharan Africa. Russia's friendship with African nations is based on decades of good and trustful relationships. Our government has always supported Africa and helped their people to fight for justice, freedom and independence. Russia will continue to help African nations in their development, enhancement of their economic potential, welfare of their citizens and upholding their national interests. In a multipolar world, Africa is our reliable partner

We are ready for comprehensive and equal cooperation for the implementation of the most ambitious joint projects in the military-technical sphere.

Of course a significant impetus for military-technical cooperation development with African nations has been given by long-established Russia-Africa summit hosted and held under the personal supervision of the President of the Russian Federation.

What are the most brilliant pieces of armament that Rosoboronexport promotes on foreign markets today?

- All samples of the modern russian products promoted by us are in demand on the market. Of course some of them are in the greater demand. Among the products for the Air Force we can highlight the Ilyushin II-76MD-90A military transport aircraft, the Sukhoi Su-35 and

the Sukhoi Su-30SME fighters, the Sukhoi Su-34E fighter-bomber, the Kamov Ka-52E combat scout attack helicopter, the Mil Mi-17 military transport helicopters and guided airdelivered ordnance for destruction of air, ground and surface targets. There is great demand for Russian unmanned aircraft systems - Orion-E reconnaissance and reconnaissance/ strike unmanned aircraft systems, Orlan-30 and Orlan-10E reconnaissance UAVs and Kub-E kamikaze drone

forces are interested in a wide range of anti-aircraft missile systems and complexes of various ranges of fire: the S-400 Triumf air defense missile systems, the Antey-4000 air defense missile system, the S-350E 'Vityaz' air defense missile system, 'Viking' air defense missile systems, 'Buk-M2E' air defense missile systems, 'Tor-E2' and 'Tor-M2E' ADMS, the Pantsir-S1 self-propelled air defense missile/ gun system, the Igla-S and Verba MANPADS. Russian electronic warfare and countermeasures equipment - radar stations, electronic suppression systems and UAV countermeasures equipment – are also in high demand on the market.

keep a high profile to the T-90S and T-90MS main battle tanks, the 'Sprut-SDM-1' light amphibious tank, the BMPT tank support combat vehicle, the TOS-1A heavy flamethrower system, 'Tornado-G' MLRS, 'Msta-S' self-propelled howitzer, 'Tigr' and 'Typhoon' special purpose armored vehicles, anti-tank systems and small arms.

Among Russian naval systems Rosoboronexport notes customer interest in the Rubez-ME coastal tactical missile system, The Pantsir-ME air-defence missile and artillery system, the Club-S and Club-N integrated missile system, as well as modern ships and submarines capable of carrying them on board: the Project 22356 multipurpose frigate, vette, the Project 22160 patrol ship for distant sea areas, the Karakurt-E small missile ship and others.

- What competitive advantages of Russian defense products are

# other countries."

#### most valued by Rosoboronexport's partners?

- Thanks to a great deal of attention on the part of the state leadership as well as the glorious long-standing Representatives of the air defence traditions today Russia's weapons have reached a qualitatively new stage in their development. Hightech complexes and weapon systems have been created that set the standard for armorers around the world. The financial, material and human resources invested in R&D efforts at defense industry enterprises have made it possible to develop the most cutting-edge production technoloaies

All products offered by Rosoboronexport are capable of operating reliably and efficiently in a wide range of climatic conditions. The experience of combat use of Russian weapons in military conflicts and major anti-terrorist opera-The land forces of our partners tions by various countries around the world has demonstrated their effectiveness and compliance with the declared capabilities.

> Today Rosoboronexport in cooperation with the Rostec State Corporation and other major Russian industrial companies is actively engaged in industrial cooperation involving joint projects to design and manufacture the high-tech weaponry and military equipment on the customer's premises. We have positive experience in implementing more than a hundred such contracts around the world.

Our efforts in India is the poster child for a comprehensive industrial partnership within the framework of which we manage to settle down joint projects for all branches of the Project 20382 multipurpose cor- the armed forces with cooperation level between companies in the two countries being unique on the global market

> We have a long-term project with Hindustan Aeronautics

#### 70 YEARS OF SUCCESS

'Rosoboronexport gives special attention to industrial partnership projects with foreign customers. The company has a large portfolio of licensed production facilities and joint ventures in India, Malaysia, Vietnam and a number of

> Limited (HAL) to license production of the Indian Air Force's most popular aircraft that is the Sukhoi Su-30MKI and we are standing by to get the green light to produce the Kamov Ka-226T light multipurpose helicopters on the basis of a joint venture. India produces T-90 and T-72 main battle tanks, BMP-2 infantry fighting vehicles, 'Mango' and 'Invar' projectiles. Production of Kalashnikov AK-203 assault rifles has been launched at Korwa Ordnance Factory and it will eventually reach a 100 percent localization tion level. There are joint projects on behalf of the Indian Navy and we are expecting cooperation on air defense missile systems.

# **INDO-RUSSIAN RIFLES PVT. LTD.** SHAREHOLDERS ROSOBORONEXPORT **KALASHNIKOV**

'Foreign customers appreciate Rosoboronexport's expertise and the opportunity to collaborate with the Russian defence industry through the single-window service provider as we are offering a full package of services for the export of high-tech military and civilian products and the transfer of technology.'

> Moreover, Rosoboronexport is actively working on technology projects with other nations namely from the Middle East, the Asia-Pacific region and the CIS states. One of the promising areas under implementation is the installation of weapon stations made by partner states on Russian platforms. We also offer and have already successfully integrated Russian modern weapon station into the armored vehicles of foreign design.

All the products we promote have state-of-the-art technical training equipment and high-tech simulators certified by the manufacturing companies. Besides, Rosoboronexport provides personnel training for maintenance and operation at the best military training facilities.

The Russian defence industry is conducting a large-scale import substitution programme, which will eventually lead to import-independence for most production facilities. This gives our partners confidence in the timely and full maintenance of supplied products as well as its upgrade and development.

- The list of Rosoboronexport's successes and achievements over the years is extensive but for yourself which successes would you highlight in the first place?

- If we talk about the entire period of Rosoboronexport's history, I would first of all mention that we hold one of the top rating in the global arms market, the high credibility of a reliable and strong partner among customers and the timely implementation of the tasks assigned by the President of the Russian Federation, who is at the top of the military-technical cooperation vertical.

As for the period since 2017 when I was appointed as the Director General of Rosoboronexport, the main achievement was its successful adaptation to the harshest manifestations of unfair trade competition from the USA and other Western countries – imposed sanctions – and stable work under this condition.

As you know in April 2018 Rosoboronexport was put on the US list of sanctioned companies. Of course we realized right away that we would have to work for a long time under sanctions. We were prompt enough to implement the necessary measures and set up all the operational work so that Rosoboronexport could feel fine on the market.

When it comes to specific projects one of the main achievements is the contract to supply India with S-400 'Triumph' long-range air defense missile systems, concluded during the Russian-Indian summit in New Delhi on 5 October 2018. It became the major project for the entire period of military-technical cooperation between Russia and India. The same systems were delivered to a NATO country despite strong opposition and political pressure from rivals. We returned to sub-Saharan Africa and are active engaged into operations there

- What helps Rosoboronexport not to cut down momentum and maintain a high bar of foreign economic activity against the current backdrop of unprecedented pressure and sanctions from a number of states?

In the course of business activity, we feel great support from the President, the Government of the Russian Federation, the Federal Service for Military-Technical Cooperation, the Rostec State Corporation, Russian financial regulators and major banks. A set of measures has been formed to ensure that Rosoboronexport continues to implement all intergovernmental agreements and long-term contracts with partners.

The President is promptly taking the necessary measures in today's difficult situation for the entire Russian defence industry and as well as foreign trade system. Legislation supporting Russian industry and military-technical cooperation with foreign nations are being considered and enacted at all levels of national authority.

Of course the incredible devotion and operating capability of all defence contractors who were capable to fulfil our export obligations while delivering state defence order and providing the Russian Armed Forces with the necessary weapons and military equipment.

But there is another very important thing which I have already mentioned that is the confidence of our partners. Our partners have had a confidence in all of our initiatives, they understood all of our suggestions on how to work under sanctions, and so far we have had a pretty good result.

- What global arms market development trends do you see today and how does the Russian military-industrial complex meet those requirements?

- The main focus today is on unmanned military equipment and robotic systems. The use of unmanned vehicles and systems is envisaged in all environments – on the ground, in the air, on water and underwater.

Today the introduction of artificial intelligence in the mass data processing on warfare setting and for decision-making is actively developing. The use of electronic warfare, secure digital communications and electronic reconnaissance are of great importance in modern conflicts. There is a movement towards the use of new physical principles in the design and production of weapons and ammunition.

Joint developments in the field of laser technologies and super-high frequencies to combat unmanned aerial vehicles of various applications should be among the priority trends. The development of these technologies will make it possible to provide our foreign partners with air defence systems capable of destroying UAVs almost instantly at minimal cost.

The future of missile know-how is hypersonic technology. Russia is ahead of other nations in hypersonic technology and is not going to slow down in its development.

- What things do attract foreign partners to cooperate with Rosoboronexport?

- Foreign customers appreciate Rosoboronexport's expertise and the opportunity to collaborate with the Russian defence industry through the single-window service provider as we are offering a full package of services for the export of high-tech military and civilian products and the transfer of technology. Rosoboronexport give ttention to industrial par

Rosoboronexport gives special attention to industrial partnership projects with foreign customers. The company has a large portfolio of licensed production facilities and joint ventures in India, Malaysia, Vietnam and a number of other countries.

Today the global economy is demanding production localization; countries are interested in technological cooperation and job creation. Thus the nations of South-East Asia, North Africa, India and China have already formed their own industrial platforms. Rosoboronexport is ready to work on them and together with industry and the Rostec State Corporation promote Russian hightech solutions and develop new products together with partners.

- What would you like to wish to the employees of Russia's military and technical cooperation sector today?

'In the course of business activity, we feel great support from the President, the Government of the Russian Federation, the Federal Service for Military-Technical Cooperation, the Rostec State Corporation, Russian financial regulators and major banks. A set of measures has been formed to ensure that Rosoboronexport continues to implement all intergovernmental agreements and long-term contracts with partners.'

#### 70 YEARS OF SUCCESS

![](_page_15_Picture_32.jpeg)

It is my sincere pleasure to to congratulate the staff of all the entities involved in Russia's military-technical cooperation with foreign nations. I extend my heartfelt congratulations and gratitude for their fruitful joint work and support rendered to the Federal Service for Military-Technical Cooperation and the Rostec State Corporation.

I would like to express my appreciation for the efforts made by all enterprises within the military industrial sector in order to create and produce modern high-tech products with great export capacity.

We are focused together on new successes and on the further streamlining of the system of military-technical cooperation. Thus we must do everything possible to ensure that Russia's system of military-technical cooperation remain competitive and actively seized for the leading position around the globe.

![](_page_16_Picture_0.jpeg)

## More than 50 years of work in the field of military-technical cooperation

Russia's military-technical cooperation with foreign countries provides solutions to a wide range of tasks - from directly economic to geopolitical. Leading Russian defense enterprises are involved in the military-technical cooperation. Among them is Izhevsk Electromechanical Plant Kupol (part of Almaz -Antey Air and Space Defence Corporation), the main designer and manufacturer of the Tor family SAMs.

![](_page_16_Picture_3.jpeg)

EMZ Kupol has been involved in military-technical cooperation for many decades. For the first time, the company's products 'crossed the ribbon' as part of the final products of the main manufacturers. Thus, in 1964, the plant began to produce the most important components and control devices for combat operations for the world's first mobile anti-aircraft missile system Krug. These SAMs were in service not only with the Soviet Army, but also with the armies of the Warsaw Pact countries.

IEMZ Kupol also participated in cooperation in manufacturing SAM Kvadrat - the export version of the SAM Kub. These complexes were supplied abroad in large quantities, as well as to Arab countries, where they took an active part in combats. In particular, according to the Syrian side, during the Yom Kippur War, 64 enemy aircrafts were shot down by the crews of the SAM Kvadrat.

In the 70s, the participation of IEMZ Kupol in the military-technical cooperation reached a new level. The plant was appointed the head enterprise for the production of the SAM Osa and since then has been directly responsible

for the quality of products that have been supplied, including for export. The SAM Osa and its modifications were, and in many cases are still in service with the armies of two dozen countries around the world. They have repeatedly taken part in military operations. In particular, during the 1982 Syrian-Israeli conflict, an F-4 Phantom fighter-bomber was shot down by the Osa, and in 1988-89, two UAVs nition, increased noise immunity and and a reconnaissance aircraft were destroyed during the battles between zone. IEMZ Kupol is also ready to Angola and South Africa.

Starting from the mid-90s, IEMZ Kupol began supplying abroad the Tor family SAMs, one of the best air defense systems in the world. Today, the Tors are in service not only with family SAMs according to the carrier the Russian army, but also with the armies of a dozen other countries. The high demand on the world market for the Tor family SAMs are ensured by the outstanding tactical cooperation consist, among other and technical characteristics of the system, the high quality of its manufacture, as well as the reliability of the main manufacturer – IEMZ Kupol.

their other unique tactical and technical characteristics, are autonomous air defense systems, which makes it possible to flexibly build anti-aircraft missile units of the necessary composition and allows for effective integration of the SAM Tor with air defense systems operating in the armed forces of foreign customers.

The SAMs Tor are continuously being improved. The newest of them is the SAM Tor-E2 (the promotional passport was signed in 2020) and its version on a two-link off-road transporter, the SAM Tor-A. These combat vehicles are representatives of a new generation of short-range air defense systems. Compared with earlier modifications, the combat vehicle has in its composition the latest anti-aircraft guided missile, doubled ammuan expanded air targets destruction supply foreign customers with the SAM Tor-M2K on a wheeled chassis, and the SAM Tor-M2KM in the form of an autonomous combat module. The wide diversification of the Tor base allow the customer to choose the chassis version most suitable for solving the tasks facing him.

The benefits of military-technical things, in the fact that the buyer country is significantly connected with the country that sold the weapon for the entire period of opera-These products, in addition to tion of the product, since it needs to be maintained, repaired, supplied with spare parts, etc. However, this requires a responsible approach of the manufacturer, fulfillment of its obligations under the contract. The IEMZ Kupol flawlessly fulfills all its obligations and timely supplies the proper quality of spare parts, components and assemblies to maintain the combat readiness of products. If necessary, customers are provided with

![](_page_16_Picture_13.jpeg)

#### 70 YEARS OF SUCCESS

![](_page_16_Picture_16.jpeg)

comprehensive technical assistance in the restoration of products, including both the supply of spare parts, components, assemblies, devices, special and auxiliary equipment, as well as maintenance, repair and other works that provides comprehensive maintenance of previously delivered equipment. JSC IEMZ Kupol successfully solves the issues of providing components, even if they are no longer produced by related companies. In some cases, specialists of the company's design services develop new circuit solutions using modern components.

For decades of work on the world market, IEMZ Kupol has established itself as a reliable supplier, consistently fulfilling all contractual obligations under contracts in full and

on time, and producing reliable and high-quality products. Through its work, IEMZ Kupol strengthens relations between Russia and partner countries.

In some cases, military-technical cooperation grows into cooperation between armies. One such example is the joint Egyptian-Russian exercise Arrow of Friendship-2019 that took place in 2019. This event was the first joint exercise of the air defense forces servicemen of the Russian Federation and the Arab Republic of Egypt. It involved the SAMs Tor-M2E and their combat crews, which were in service with the Egyptian Armed Forces air defense.

The achievements of Izhevsk Electromechanical Plant Kupol in providing military-technical cooperation are highly appreciated by the Federal Service for Military-Technical Cooperation of the Russian Federation (FSVTS). Employees of the IEMZ Kupol have repeatedly been awarded the Golden Idea Award, established by the FSVTS. In 2000 and 2001 their achievements were awarded the first prizes in the nomination 'For success in the production of export-oriented military products', in 2002 the second prize in the nomination 'For

![](_page_17_Picture_4.jpeg)

The Izhevsk Electromechanical Plant Kupol successfully solves the tasks facing the enterprise in the field of militarytechnical cooperation by introducing the latest developments of domestic military-technical thought and continuous research and development work, which the company conducts independently; regular technical re-equipment of production; strict quality control of products; competent management and highly qualified personnel. In turn, the military-technical cooperation is one of the significant factors for ensuring the economic stability of the enterprise and its vigorous development for IEMZ Kupol.

![](_page_17_Picture_6.jpeg)

personal contribution to the development of military-technical cooperation', in 2007 - the second prize 'For success in the production of military products'. In 2015, the FSVTS diploma and the prize in the nomination 'For personal contribution, initiative and diligence in solving problems of military-technical cooperation' was awarded to the General Manager of Kupol Fanil Ziyatdinov. In 2017 the plant received the third prize in the nomination 'The best co-executive enterprise - for its contribution to improving the competitiveness of military products'. On December 12, 2022, by the decision of the Organizing Committee of the Golden Idea National Award, the staff of the enterprise was awarded the Third Prize in the nomination 'For success in the production of military products, the introduction of advanced technologies and innovative solutions'. /RA&MG

### A L W A Y S

![](_page_17_Picture_9.jpeg)

![](_page_17_Picture_10.jpeg)

RUSSIA

A S/

![](_page_17_Picture_13.jpeg)

ΤΟΡ

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## MTIE 'GRANIT' Maintenance and repair – at customer's site

At present, the armed forces of the Russian Federation's partners in military-technical cooperation operate a large number of various Russian-made air defence armaments. The air defence armament fleets in these countries have been formed over a long period and include both equipment delivered decades ago and new generation weapons. Foreign customers' complacency with the efficiency, technical characteristics, and reliability of supplied armaments is proved by their interest in further reliable use of that equipment.

here is no doubt that the Russian party is ready to provide its partners with modern weapons with emerging technical solutions and improved characteristics to replace the existing equipment. However, foreign customers, guided by economic feasibility, reduced time expenditures, and the possibility of obtaining equipment's repair techmaintain its combat capabilities by acquiring armaments' repair.

Until recently, the Russian party offered a solution to this by organizing a comprehensive service that would include the repair of some components at Russian facilities, supply of spare parts, as well as revitalization of equipment at its deployment sites by Russian specialists.

The scope of competence and 70 years of experience of MTIE 'Granit' (an enterprise of ADS Corporation 'Almaz - Antey') in the maintenance and repair of equipment, development and manufacturing of repair bodies (complexes), training of personnel in maintenance and repair gave the Russian side the opportunity to offer customers solutions that meet the claimed needs.

The REDICOM diagnostic and nologies, are considering ways to repair equipment set is designed for rapid repair of faulty component parts directly at the deployment sites of the serviced equipment.

The REDICOM consists of seven specialized mobile diagnostic and repair complexes (RDC) designed to perform the following tasks:

operability control, malfunction diagnostics and repair of typical replaceable elements of electronic equipment included in the attached sets of operational Spare

Parts, Tools and Accessories (SPTA) of the serviced equipment - subunits, cells, modules, boards.

- repair of mechanical and electromechanical structures, hydraulic units and assemblies, life support equipment - hydraulic cylinders, reducing gears, mechanisms, basic load-bearing structural elements (frames, racks, cabinets, units) fans, air conditioners, filter and heating units;
- maintenance and current repairs of mobility equipment - vehicle base chassis, trailers, semi-trailers, cabs, bodies, vans;
- repair, adjustment and replacement of units, attachments of mobility equipment;
- maintenance and charging of batteries:
- related gas and electric welding, painting, lubrication and filling works;

- calibration, adjustment, current repairs of measuring instruments from the equipment to be serviced and from REDICOM.

Mobile RDCs, included in REDICOM, are built on a unified design base - standard container body, which ensures protection of RDC personnel from external adverse effects - climatic factors, electromagnetic fields, chemical, bacteriological and radiological impact.

One of the advantages of the REDICOM set is the flexible architecture of the attached software, which allows, in a short time and with minimal re-equipment work, to extend the capabilities of the REDICOM set to repair other types of armaments.

In order to master the skills of correct and efficient operation of the REDICOM set, the appropriate training course is provided for the customer's specialists.

ring the post-warranty period allows the customer to independently and promptly perform repair of failed elements, increase combat readiness of supplied equipment and significantly reduce time and financial expenses on purchase of foreign spare parts ern diagnostics and repair means. and service of foreign specialists.

repaired on the deployment site, or if the manufacturer's specified service life has expired, the equipment must be sent to a specialized repair facility for restoration work.

To do this MTIE 'Granit' is ready to assist foreign customers in construc- training courses, rooms for practical ting of specialized stationary technical repair centers of air defence weapons and equipment (TRC), including:

- technical assistance in the renovation or construction of TRC in the repair of operating equipment industrial facilities on the client's premises - development and sup-

ply of documentation, support for construction and installation work; supply of equipment for parameter monitoring and fault diagnosis, repairs, autonomous adjustment of individual systems and units, comprehensive adjustment as a whole, sets of spare parts and consumables, technical documentation to support repair work in the TRC;

- carrying out start-up and adjustment operations of TRC's equipment;
  - training of customer's specialists in Russia and/or in the customer's country on how to carry out the work in the TRC.

Using of unified equipment and standard technological processes and repair schemes allows to carry out repair of various types of military equipment on the basis of TRC. The stationary technical repair center The use of the REDICOM set du- located on the customer's territory will allow the customer to carry out complex diagnostics, disassemblyassembly, repair of the supplied equipment independently, as well as to extend and restore its operational resource due to application of mod-

MTIE 'Granit' has created a mate-If complex faults cannot be rial and technical base of the training center, allowing theoretical and practical training of customer's specialists in the operation of repair means and acquisition of repair technologies. The training center provides

classrooms for general and special training, self-training rooms, utility rooms. Measures for access restriction are taken.

The practical part of the training can take place at the customer's premises.

![](_page_18_Picture_32.jpeg)

#### 70 YEARS OF SUCCESS -

![](_page_18_Picture_39.jpeg)

![](_page_18_Picture_40.jpeg)

Despite the advantages of these solutions, under certain circumstances there is still a demand among customers for comprehensive maintenance of weapons and military equipment, in order to do that MTIE 'Granit' has the necessary personnel, documentation and technological equipment and it can provide technical condition assessment, maintenance and repair and other service works. RA&MG

## KORNET-E *New capabilities of antitank guided weapons*

Development and manufacture of antitank guided weapons have been carried out for half a century all over the world. Within this period these guided missile systems have turned out to be in the demand and most popular type of high precision weapons due to combination of such advances as simple operation, reliability, pin-point guidance and affordability. High popularity of antitank guided weapons is easily explained by its capability to cause damage to the enemy that shall be crucially higher than friendly force expenditures. In fact one-two antitank guided missiles shall be enough to kill the enemy tank, missiles prices being by ten or even hundred times lower than that of MBT.

nitially antitank guided missile systems were developed to fight tanks. However modern battlefield scenario has greatly changed – large-scale hostilities between tank armadas have given way to scattered fights in local conflicts. And on this new battlefield ATGW have appeared to be attractively effective not only against MBT but also against other small-size targets including lightly armoured and soft vehicles, cars, fortifications, points and snipers.

The Kornet-E weapon system developed by JSC 'KBP named after Academician A. Shipunov' in the early XXI century remains to be one of the mostly demanded antitank

missile systems in the world military market

Due to availability of a shapedcharge warhead primarily designed to engage heavy armour contributed by a thermobaric high explosive warhead of blast effect Kornet-E ATGW has become an effective defence and attack weapon capable to destroy a wide range of targets on the modern battlefield.

Open media read that the Kornet-E system, including self-propelled home-made versions, is being used manpower, enemy infrastructure, fire intensively and effectively in the current local warfare in the Middle East against all and any military armaments, equipments and manpower (Figure 1).

> However the current develop- trouble is high price of the 'expendment trends put forward new tasks

to be provided by this type of the weapon, including:

KOPHET-3M

- extended effective firing ranges
- improved mobility
- guidance automation to reduce operator's influence on the engagement success
- 'fire and forget' or 'fire, see and adjust' features
- capability to fight various aerial targets.

Oversea designers prefer to meet these requirements by mounting different guided weapon modules on lightly armoured carriers. Herewith they mainly use missiles equipped with IR or TV seekers (Figure 2).

This approach has advantages and drawbacks, and the most serious able' part - a missile with a seeker

![](_page_19_Picture_17.jpeg)

Figure 1. Firing Kornet-E ATGW from a vehicular platform

causing significant financial expen- to alternative solution to have a tarditure to equip equal army units. For example, the contract values with the same Customer for equal quantities of Kornet-E and Spike ATGW to equip the same units are \$25 mln and \$48 mln, respectively.

With a financial factor in mind and to solve the above tasks, JSC 'KBP named after Academician A. Shipunov' has created the Kornet-EM multi-purpose missile system which realizes stat-of-the-art capabilities using breakthrough engineering solutions which allowed to obtain advanced ATGW with guite (Figure 3).

Advancement of science and tech- for training. nology at the beginning of the XXI century gave birth to innovative technologies and new materials and thus allowed to realize 'fire and forget' or 'fire, see and adjust' principles without using a seeker onboard the missile due Kornet family.

get autotracker added to the groundbased equipment installed on board the vehicle. This approach allowed to transfer seeker functions from an 'expendable' part of the weapon system into its 'constant' multiple-use part.

Machine vision plus the target autotracker increases target tracking accuracy by 5 times compared to the previous ATGW generation and thus provides for high fire accuracy at ranges up to 10 km.

Availability of an automatic target engagement mode shall reduce the Operator's psychophysical problems, a number of new attractive features simplify requirements to his skills and thus shall cut the time required

The crucial part of the new weapon system is its automated launching unit (ALU) designed on the principle of modular approach which have been always traditional for the

Main Techwnical and Performance Data Firing range by day and night, m			
– 9M133M-2 ATGM	150-8000		
– 9M133FM-3 GM	150-10000		
– 9M133-1 ATGM, 9M133F-1 GM	100-5500		
Guidance	automatic laser beam riding		
Jam-proof capability	high		
Ammunition load, pc	16		
including ready-to-fire missiles	8		
Firing modes	1 missile from 1 launcher against 1 tars 2 missiles from 1 launcher against 1 tar 2-4 missiles from 2 launchers against 2		
Possibility to fire Kornet-E ATGM	yes		

#### 70 YEARS OF SUCCESS

ing and guidance module (SGM) with televiewer and thermal imager channels (TV/IIR sight), four missile launching guides and independent elevation and azimuth drives. SGM is fixed on a special frame which together with a sliding roof is installed in the opening on the carrier roof. The frame has a lifting mechanism provided to put SGM up for firing and to return it back for travelling. This frame also houses various electronic components which control SGM and ALU operation in general.

The main part of ALU is its sight-

![](_page_19_Picture_33.jpeg)

Figure 2. Rafael firing unit with Javelin missiles (IR seeker)

On the move ALU has its travelling configuration with SGM located horizontally inside the vehicle and thus being invisible from outside. To fire. SGM shall be raised outside with the help of the lifting mechanism, put vertically and fixed to provide a firing position.

Two ALU carried by the vehicle are independent in operation and yet do not require one more operator. It offers the following advantages:

- only one operator is required to control both ALU,
- the weapon system can simultaneously engage two targets with

![](_page_19_Picture_39.jpeg)

get rget target

Figure 3. Kornet-EM on Tiger-M Vehicle

![](_page_20_Picture_1.jpeg)

Figure 4. Automated launching unit (ALU) 1 – sliding roof; 2 – TV/IIR sight; 3 – missile guides; 4 – SGM; 5 – frame with lifting mechanism; 6 – electronic components; 7 – monitor;

8 – operator's console

vation.

- 2fold increase in the rate of fire and target engagement rate,
- target and to search for another one simultaneously.

vided by the Operator from the Operator's station inside the carrier, and it comprises a control console and LCD monitor. Using this monitor the Operator observes the outside situation, searches for targets and provides target tracking. The operator can select a surveillance mode using TV or IIR channel and either in a wide or in a narrow field of view. He shall use console controls to produce the following commands:

- to put ALU up into a firing position and to return it back inside,

to start ALU laying vertically and 8 km and the 9M133FM-3 guided horizontally,

- target tracking,
- for selected target tracking (in an automatic mode as well), missile selection, missile launch and guidance

The main smart component of the ALU equipment is an information-management system which integrates the Operator's console with SGM to provide a single system, delivers Operator's commands to ALU actuating components and registers/controls ALU parts operational resource

In the combat process the Operator shall detect a target on the different azimuth, range and ele- monitor display, aim SGM at this target so as to put a target image inside a target autotracker gate, produce a target acquisition command to the - capability to deliver fire to the one target autotracker, select a missile type to be fired, and launch a missile when the autotracker is ready. When The ALU control is to be pro- these steps are done the Operator's job is finished: SGM shall be tracking a target and guide a missile to the target automatically by target autotracker commands. But if the Operator detects a more vital target he can stop automatic guidance and send the missile to a new target. Thus the Kornet-EM system offers 'fire and forget' and 'fire, see and adjust' prin- ings, bunkers, manpower, fortificaciples realization.

New missiles have been developed to be used with this weapon system: the 9M133M-2 antitank guided missile with a flight range up to

missile with a flight range up to 10 - for the TV/IIR sight control and km. Moreover this weapon system has a 'long arm' advantage, i.e. capability to effectively fight the enemy remaining safe beyond the enemy return fire.

> In general the 9M133M-2 antitank guided missile (ATGM) has borrowed the design solutions from its predecessor used with the Kornet-E system. But it outperforms the latter in range being extended from 5500 m to 8000 m due to aeroballistics optimization, and also has a modernized shaped-charge warhead which provides 10% increase in armour penetration up to 1100 -1300 mm. With this enhanced missile the Kornet-EM weapon system has obtained capability to engage all modern MBT enjoining possibility of high potential growth to counter future tanks with increased armour protection (Figure 5).

> The 9M133FM-3 guided missile turns out to be radically new in the class of missiles used with ATGW (Figure 6). It has an extended flight range up to 10 km, thermobaric WH of blast effect and it is equipped with a proximity fuse. The 9M133FM-3 guided missile has been designed to engage various lightly armoured and soft targets such as cars, buildtions, infantry fighting vehicles and armoured personnel carriers as well as small size low level air targets like helicopters, unmanned aerial vehicles (UAV) and others. In accordance with the selected target the Operator can switch off or switch on the proximity fuse, i.e. one and the same missile can be used as against ground-based targets (proximity fuse is switched off - explosion shall be on impact) so as against aerial targets (proximity fuse is switched on explosion shall be near the target).

> The missile with a proximity fuse and a flight range of up to 10 km contributed by machine vision, high quidance accuracy and target autotracker available with ALU makes Kornet-EM obtain the innovative feature - capability to engage low velocity aerial targets (helicopters, UAV).

New capabilities of the Kornet-EM weapon system are well combined

RELIABLE PROTECTION OF FORE GROUND AGAINST LAND AND AIR ATTACKS

KBP

Figure 5. 9M133M-2 ATGM

Main Specifications		Mair
Firing range, m	from 150 to 8000	Firing WH T
Armor penetration of 9M133M-2		at lea
ATGM beyond ERA and without	1100 – 1300	Fuse
ERA, mm		Missi
Missile containerized weight, kg	31 ± 0,5	weig
Length of container with a missile, mm	1210	Leng with

![](_page_20_Picture_24.jpeg)

Figure 6. The 9M133FM-3 guided missile

Main Specifications	
Firing range, m	from 150 to 10000
WH TNT equivalent at least, kg	7
Fuse	impact/proximity
Missile containerized weight, kg	33 ± 0,5
Length of container with a missile, mm	1210

![](_page_20_Picture_27.jpeg)

## KORNET-EM MULTIPURPOSE MISSILE SYSTEM

JSC \*KBP NAMED AFTER ACADEMICIAN A SHIPUNOV\* 59 Shcheglovskaya Zaseka Str. 300004. Tula, Russia, Phone: +7 (4872) 410-210, Fax: +7 (4872) 426-139, E-mail: info@kbptula.ru, www.kbptula.ru

HIGH-PRECISION WEAPONS

with the attractive features borrowed from its predecessor -Kornet-E ATGW based on the Kvartet Launching Unit among them possibility of a salvo fire, i.e. engagement of a single target by two missiles riding in one and the same laser beam. This firing mode is very helpful to fight hard armour and the targets provided with an active protection system. Two missiles shall be launched from the same launching unit with a short time interval (less than 2 s), one missile shall initiate ERA and the second missile shall hit the target.

By now Kornet-EM ATGW has been proved in all required tests and is being serially manufactured and installed on the Tiger-M vehicle against the contract with the overseas Customer. Yet the ALU modular design allows to integrate the Kornet-EM system with practically any vehicle, of foreign manufacture as well, provided the carrier load capacity and inside volume are enough to do it. In case a carrier load capacity is 1.0-2.0 tons single ALU shall be installed, if a load capacity is 1.7-1.9 tons it shall be possible to install two ALU.

The comparative analysis of the mobile Kornet-EM version and its foreign equivalents shows that in traditional missions Kornet-EM outperforms the weapon systems, which use ATGW with a seeker to provide homing, by 3-5 times estimated on the basis of cumulative factors, and yet the Kornet-EM is easier to use and to provide services to, has 2-3 times less price for its guided missiles being an expendable part of the weapon system and thus a cru-

![](_page_21_Figure_4.jpeg)

![](_page_21_Figure_5.jpeg)

cial factor which determines weapon system service costs when it is in the army (Figure 7).

Moreover Kornet-EM is available as a tripod version with the 9P163M-2 launching unit. In this configuration Kornet-EM enjoys all the advantages of the Kornet-E system with the latter high capabilities that have been proved in the recent local conflicts (Figure 8).

The design of the Kornet-EM launching unit is practically identical to the one used with Kornet-E ATGW. Main upgrade efforts were undertaken towards modernization of the sighting and guidance unit (SGU) and the latter was developed to have a new sighting channel with adjustable magnification (12x and 20x) and thus to provide more convenient operation for the User at long target ranges. To ensure high guidance accuracy at 10 km range, the

laser guidance channel has been also modernized

Moreover, a new thermal sight -1PN79M-3 - was designed to be of the third generation and configured for a closed-loop operation without cooling bottles as those used with the earlier Kornet-E thermal sight.

High design similarity between the Kornet-EM and Kornet-E launching units provides for minimized Customer's costs of old system replacement by the upgraded one practically there is no need to provide fresh training for users and tech-

Pioneering technical solutions together with high guidance accuracy, formidable warheads, operation reliability and simplicity shall ensure high market demand worldwide as for the self-propelled version so as for the tripod variant of Kornet-EM ATGW for the next 10-15 years. /RA&MG/

![](_page_21_Picture_13.jpeg)

Figure 8. Kornet-EM tripod version

# TYPHO FOR FOREIGN MARKETS

Rosoboronexport (part of the Rostec State Corporation) has started promoting fully import-substituted Typhoon K-53949 mine resistant ambush protected (MRAP) vehicles in foreign markets. The Typhoon-K vehicles feature high reliability, maneuverability, cross-country ability and innovative approaches to their protection, ergonomics, layout and equipment. They can ford up to 1.5 meters without preparation and climb 30-degree slopes. With a new generation 350hp diesel engine, the Typhoon K-53949 can reach a maximum speed of 100 km/h.

osoboronexport presents to its partners an armored vehicle of the Typhoon-K family assembled exclusively from

Russian-made components. This vehicle has proven to be a reliable and highly protected personnel carrier. The Typhoon-K is in service with the Armed Forces of the Russian Federation and has substantiated its performance under actual operating and combat conditions. Moreover, many of Rosoboronexport's partners are operating armored vehicles based on this family of vehicles and give them positive feedback,' said Rosoboronexport Director General Alexander Mikheev. 'This MRAP vehicle is of great interest for Middle Eastern, African, Latin American, Asia-Pacific and former USSR countries. Independence from foreign components in the production of the Typhoon-K gives us and our partners confidence in timely and complete after-sale service of the vehicles supplied, their modernization and development.

All models of the Typhoon-K family are equipped with an onboard information management system, as well as a streamlined hull design

a central tire inflation system, bullet-proof tires, an all-round video surveillance system, an automatic fire-extinguishing system, and a diesel auxiliary power unit (APU). In addition, remotely controlled weapon stations with stabilized armament can be mounted on them. The armament suite varies depending on customer needs.

The 4x4 vehicles are equipped with a hinged ramp in the rear to allow troops to board and disembark from them guickly and easily.

Vast experience in the development and operation of army vehicles has been complemented by new approaches to design and state-ofthe-art technologies of protection against the most dangerous threats.

Typhoon K-53949 armored vehicles are distinguished by enhanced mine and ballistic protection corresponding to NATO STANAG 4569 Level 3 with the possibility of strengthening it to Level 4. A high level of protection is pro-

vided by composite armor, including an armored hull and add-on armor plates with ceramic elements,

Firing range by day and hight, m	
– 9M133M-2 ATGM	150-8000
– 9M133FM-3 GM	150-10000
– 9M133-1 ATGM, 9M133FM-1 GM	100-5500
Guidance	semi-automatic remote control in direct laser beam (beam rider technology)
Jam-proof capability	high
Operation temperature range, °C	from minus 20 to + 60
Weight, kg – launching unit	26

8.7

yes

Possibility to fire Kornet-E ATGM

- thermal sight

Main Technical and Performance Data

70 YEARS OF SUCCESS

and removable anti-mine plates. Troop seats have a suspended system of attachment to the roof, are equipped with blast energy absorbing elements, safety belts and head restraints for fixing the head. In addition, the designers have provided for the possibility of installing additional protection - internal spall lin ers, as well as special hinged mats to increase the level of protection against anti-tank grenade launchers.

Vehicles for various purposes are being developed from the Typhoon-K chassis by installing weapons, process, engineer and other special equipment.'Rosoboronexport sees great interest from foreign customers and is ready to cooperate in the format of industrial partnership in the production of various versions of Typhoon-K vehicles, including localization of their production. Today, we have a significant portfolio of completed projects on licensed production, cooperation within joint ventures, as well as building an infrastructure for the maintenance and modernization of Russian military equipment on the territory of partners,' Alexander Mikheev added. /RA&MG

achieved impressive success. I sincerely congratulate employees of state agencies, 'Rosoboronexport', and defense industry enterprises on the 70th anniversary of the creation of the military-technical cooperation system. I am sure that our joint work will further contribute to strengthening the position of the Russian Federation on the world stage and ensuring its national security. I sincerely wish everyone good health, prosperity and new achievements!

## TACTICAL MISSILES **CORPORATION IS A RELIABLE PARTNER IN THE FIELD OF MILITARY-TECHNICAL COOPERATION**

The system of Russian arms exports began to form up at the beginning of the 20th century. It constantly evolved, improved, and took shape in its current form in the early 2000s of the 21st century. This period was also marked by the creation of large integrated structures of the defense industry, which helped to improve the efficiency of the defense industry complex in the new political and economic conditions, as well as to develop the country's export potential. On January 24, 2002 the President of the Russian Federation signed a decree on establishment of 'Tactical Missiles Corporation', which by now has united more than forty developers and manufacturers of high-precision weapons. 'Tactical Missiles Corporation' is an active participant in military and technical cooperation with foreign countries. Its products are well known in the global arms market.

#### **Pages of History**

eration.

any enterprises that are now part of 'Tactical Missiles Corporation' (TMC/the Corporation) have a long history of relations with foreign customers in the field of military-technical coop-

Back in the mid-50s, Chinese students studying at the Moscow Aviation Institute underwent practical training at the Corporation's main enterprise located in Kaliningrad (now Korolev) near Moscow. In their turn, several specialists from the enterprise went to China to render technical assistance in mastering RS-2U air-to-air missiles.

The aviation weapons exporters were also such legendary design bureaus as JSC 'Vympel' State Engineering Design Bureau named after I.Toropov and JSC 'Raduga' State Engineering Design Bureau named after A.Bereznyak (since 2004 they have been a part of TMC). 'Vympel' in different years supplied air-toair and air-to-surface missiles (R-60, R-27, X-29TE, R-73E, RVV-AE), rocket launchers for unguided missiles,

small arms and cannon and bomber weapons. 'Raduga' supplied X-28E and X-58E anti-radar missiles, 'Ovod-ME' missile systems with X-59ME missiles, as well as sea-based anti-ship systems and self-propelled 'Rubezh-E' anti-ship systems.

In the 60s the export of torpedo and mine products developed by 'Gidropribor' Research Institute (since 2015 JSC 'Concern 'Sea Underwater Weapon – Gidropribor' has been a

![](_page_22_Picture_13.jpeg)

#### 70 YEARS OF SUCCESS

![](_page_22_Picture_16.jpeg)

The system of military-technical cooperation between the Russian Federation and foreign countries works smoothly thanks to close interaction with the customers of weapons and *military equipment. In the face of fierce* competition and political pressure, our specialists, who take part in solving the most difficult tasks of promoting Russian products, technologies, and services on the global arms market, have always

#### **Boris Obnosov Director General of 'Tactical Missiles Corporation'**

part of TMC) began. At first, the products were supplied to the countries of the Warsaw Treaty Organization, Yugoslavia and Cuba, later to South-East Asia and Africa.

In the second half of the 70s, in accordance with the decision of the Government of the Soviet Union. some friendly countries were supplied with 'Redut-E' mobile coastal missile systems developed by NPO Mashinostroenia, an enter

![](_page_23_Picture_0.jpeg)

Launch of BrahMos supersonic anti-ship missile from INS 'Kolkata' destroyer

![](_page_23_Picture_2.jpeg)

at the delivery trials of Indian Navy ships, 2004

Mashinostroenia' has been a part of TMC).

In 1980-1990, under the pro- 1991. gram of military-technical cooperation with the member states of the Warsaw Treaty Organization, 'Zvezda-Strela' State Research and Production participant in military-technical Center (as the parent enterprise of TMC was then called) together with the specialists of the German Democratic Republic (GDR) devel- Dozens of samples of radio-electron-

prise in Reutov (since 2012 JSC oped an anti-ship missile system. A 'Military Industrial Corporation NPO number of tests were carried out using components of GDR production, but the work was curtailed in

> Since 1996, JSC 'Concern 'Granit-Electron' (the former 'Granit' Central Research Institute) has been an active cooperation with friendly countries (since 2018 JSC 'Concern 'Granit-Electron' has been a part of TMC).

ic complexes for surface surveillance and target designation, ship missile control systems and anti-submarine warfare systems were supplied to the Navy of customer's states.

At the same time, the Republic of India showed interest in the military products manufactured by the Corporation. A decision was made to provide Indian specialists with technical assistance in the design and construction of the frigates. NPO Mashinostroyenia got a task to build an export version of the 'Malakhit- missile, and they signed a contract 15E' missile system for the ships.

TMC's parent enterprise also became an active participant of

the Russian-Indian military-technical cooperation. As early as 1988, a contract was signed to license production of MiG-27ML fighterbombers for the Indian Air Force, which were armed with Kh-25MP and Kh-25ML missiles (developed and manufactured by TMC's parent enterprise). In addition, representatives of the Indian Navy were the first to assess the prospects of the new 'Uran-E' shipborne missile system with the Kh-35E anti-ship for equipping Indian battle ships with it in 1994.

The most vivid example of effective international cooperation in the field of high technology is 'BrahMos' Russian-Indian Joint Venture established in 1998 under an intergovernmental agreement for the development and production of antiship cruise missile systems. From the Russian side, its participant is the 'Military Industrial Corporation NPO Mashinostroyeniya'. According to Boris Obnosov, Director General of the Corporation, relations between the partners of this project have always been built on mutual respect and trust.

200

#### 70 YEARS OF SUCCESS

![](_page_23_Picture_15.jpeg)

#### Quality and Reliability -**Our Priority**

'Tactical Missiles Corporation' focuses on providing the Russian Armed Forces with modern weapons. Military-technical cooperation with friendly foreign states also develops: more than twenty countries are reliable partners of the Corporation in the field of military-technical cooperation.

Interacting with the Federal Service for Military-Technical Cooperation of Russia and JSC 'Rosoboronexport', the Corporation solves a range of tasks related to marketing activities and supplies of military products to foreign customers

From year to year, the volume of services within the framework of the Corporation's right to independent foreign trade activities with respect to after-sales support, delivery of spare parts, units, training and auxiliary equipment for previously supplied military products, maintenance and repair work on these products is increasing.

Products with the TMC logo have a long service life and high reliability. The Corporation ensures that their

![](_page_24_Picture_0.jpeg)

technical readiness is maintained experience in demonstration of throughout their entire life cycle.

The Corporation boasts the wellequipped Personnel Training Center (based at 'Vympel' State Research and Design Bureau) where foreign equipment.

#### Marked with TMC Logo

exhibitions and aerospace shows Emirates, the Republic of South is an important element of international cooperation. The first Singapore, etc.

the products of the enterprises, creation of large-scale expositions which later became part of the at Russian armament exhibitions -TMC, was gained in 1992 at the 'MosAeroShow' event in Moscow. Later on, the samples of the enter- Space Show 'MAKS', GidroAviaSalon specialists are trained to service the prises' export products were dem- and 'ARMY' Forum. They provide an onstrated at the expositions of 'Tactical Missiles Corporation' in our country and abroad – in France, Participation in specialized arms UK, Germany, the United Arab Africa, India, Malaysia, Chile, Brazil,

TMC pays special attention to the International Maritime Defence Show, International Aviation and excellent opportunity to demonstrate the latest developments to the main customer - the Ministry of Defense of the Russian Federation. Every year at exhibitions and air shows, the Corporation holds presentation of export variants of

military products to more than forty foreign delegations. At Forum 'ARMY 2022', TMC for the first time presented to public Kh-MD-E interservice multi-purpose self-propelled short-range modular missile (dronecompatible), a new generation X-69 multi-purpose low-precision highaccuracy aviation cruise missile, and ET-1E electric torpedo.

In 2023, the Corporation also plans to take part in major exhibition events and demonstrate a number of its latest designs.

![](_page_24_Picture_10.jpeg)

![](_page_24_Picture_11.jpeg)

#### Looking Beyond the Horizon

Military-technical cooperation is one of the most important elements of the state's foreign policy, and 'Tactical Missiles Corporation' is actively involved in its implementation.

create a whole series of newest models of high-precision weapons and promotes products on the world market (today, potential buyers cannot fail to notice the high

#### 70 YEARS OF SUCCESS

![](_page_24_Picture_18.jpeg)

1-213-20

Russian President Vladimir Putin visits the exposition of the latest TMC's products

> efficiency of indigenous missile systems used in the Special Military Operation).

There is confidence that despite unprecedented sanctions and constant pressure imposed on our partners by Western Diplomacy, a new generation of high-precision The Corporation continues to weaponry designed by TMC's enterprises will successfully compete with products of the largest armsproducing companies on the world market and serve as a guarantor of security and peace. /RA&MG/

![](_page_25_Picture_1.jpeg)

**CONCERN 'GRANIT-ELECTRON' -IN THE UNIFIED STRATEGY OF MILITARY-TECHNICAL COOPERATION OF RUSSIA** 

> Military-technical cooperation for Concern 'Granit-Electron' (part of 'Tactical Missiles Corporation') has been the most important strategic component of its activities since 1996 and remains relevant and important today. All these years, through consistent implementation of its export program, Concern 'Granit-Electron' promotes Russian warfare systems and military equipment on the world market, raises the prestige of domestic technology, and strengthens Russia's cooperation with friendly countries.

tronic warfare systems (REWS) and control systems (CS) manufactured by JSC Concern 'Granit-

Electron' is carried out jointly with JSC 'Rosoboronexport', the state intermediary for military-technical cooperation, to continue the best traditions initiated by Russia in 1953 for the development of military-technical cooperation.

ing passed the test of time, have proven their reliability and efficiency in foreign customer fleets due to their high accuracy of target designation under conditions of modern enemy

he supply of radio-elec- electronic countermeasures, versatile technologies, and modernization potential. This allows the company to maintain a strong position in the weapons market for almost 30 years.

During this period, the Concern's REWS and CS models have been delivered and put into service on several dozens of foreign customer ships: projects 15, 16A, 25A, 61ME, fully equipped with Indian Air Force 1241RE, 11356, 17, 15A, 956EM, 1241.8, 1159TM, 1234ME, PS-500, The Concern's radar systems, hav- 12418 Molniya, 11661 Gepard 3.9, Van Speik are successfully performing combat missions for their fleets.

One of the most important strategic partners of Concern 'Granit-Electron' is the Republic of India,

which imports the 3C-25E target designation radar, homing heads (HH) and onboard control systems (OCS) for BrahMos anti-ship cruise missiles (ACM) to the Indian Navy.

It is worth mentioning the Concern's effective participation in the first practical test launch of the supersonic BrahMos-A missile Su-30MKI fighter against a naval target. In this project, Concern 'Granit-Electron' as the developer of OCS ACM 'BrahMos' confirmed the universality of its technical solutions implemented in this complex. In the course of the tests, the variant of interfacing the launcher with the missile control system was

'Along with the export of warfare systems, including the most modern models, it is necessary to deal more actively with the modernization of previously supplied equipment, to deploy service centers on the territories of customer states, to reduce the time needed to provide repair services." Vladimir Putin on Russia's Military-Technical

**Cooperation Strategy** 

tested and the effectiveness of the correct software was confirmed.

It was possible due to BrahMos Aerospace, a joint company established under an intergovernmental agreement between the Republic of India and the Russian Federation for more effective cooperation between the sides.

'BrahMos' is one of the best examples of successful bilateral military-technical cooperation between the countries in the field of missile armament, with the work of highly qualified specialists of the Concern 'Granit-Electron', contributed in the project.

Due to an increase in the volume of supplies of HH for the BrahMos ACM in recent years, the Concern's specialists deployed a HH repair facility with all the necessary equipment at the customer's site.

The equipment includes benches to analyze the operation of each HH device. The automatic system makes it possible to clarify the point and cause of failure, eliminate the problem and, accordingly, guickly, restore the equipment locally by replacing the devices. The implementation of this project increases ucts many times over.

Also, to support the life cycle of REWS, Concern 'Granit-Electron' has commissioned in the Armament Repair Facility of the Indian Navy the set of special technological equipment to provide combat readiness of the shipborne target designation radar system 3C-25E and anti-submarine warfare system 'Purga'.

The Concern is ready to develop cooperation with Indian partners to implement the government program of the Republic of India 'Make in India. The pilot project of the perspective cooperation under that program is the modernization of all shipborne automated control systems (SACS)

for anti-ship missiles installed on Indian Navy ships.

Within the framework of military cooperation with the Socialist Republic of Vietnam, Concern 'Granit-Electron' is preparing contracts to build coastal infrastructure for maintenance of REWS installed on Vietnamese Navy ships. The equipment has also proven its reliability in ensuring the country's security, which has contributed to strengthening Russian-Vietnamese relations.

Among the Concern's promising work in the nearest time is modernization of all 3R-60UE SACS items installed for the Indian and Vietnamese Navy to support the life cycle and use of the newest X-35UE missiles developed by the parent organization – JSC 'Tactical Missile Corporation'.

The upgraded SACS 3R-60UE ensures the X-35UE range (up to 260 km), high-precision and efficient target engagement. The SACS 3R-60UE can be interfaced with the ship's combat information control system, as well as with the satellite navigation system, which makes it possible to use the X-35UE missile with maximum efficiency.

The latest element base is used the availability of delivered prod- in the modernization of the SACS 3R-60UE, so the production of the system will be guaranteed for 10-15 years, ensuring the maintainability of equipment.

Concern 'Granit-Electron' is successfully implementing a comprehensive system of after-sales service for previously supplied military equipment. This makes it possible to repair and upgrade warfare systems without disabling the customer's equipment with a significant improvement in the tactical and technical characteristics of the systems, optimizing labor costs, time and cost parameters. At present, interaction with foreign customers on after-sales service of previously supplied REWS is car-

#### 70 YEARS OF SUCCESS

![](_page_25_Picture_35.jpeg)

![](_page_25_Picture_36.jpeg)

ried out through the parent organiza tion, JSC 'Tactical Missile Corporation'

To ensure a continuous dialogue with its partners, Concern 'Granit-Electron' takes an active part in international exhibitions of arms and military equipment for many years: DEFEXPO INDIA, Viet Nam Defence Expo, AERO INDIA, International Military Technical Forum ARMY (Russia), International Maritime Defence Show (Russia), and others.

Based on thirty years of experience in military-technical cooperation, Concern 'Granit-Electron', in close cooperation with the Federal Service for Military-Technical Cooperation and the JSC 'Tactical Missiles Corporation', follows the strategy of developing military-technical cooperation with foreign partners by exporting modern warfare systems, upgrading previously supplied equipment, deploying service centers on the territory of customer states to ensure combat readiness and life cycle support of all items.

We are ready to any kind of coopera tion with our foreign partners. /RA&MG/ www.granit-electron.com

![](_page_26_Picture_1.jpeg)

![](_page_26_Picture_2.jpeg)

nitiated as a Joint Venture (JV) military programme between India's DRDO and Russia's NPO Mashinostroyenia (NPOM) on February 12, 1998, the state-ofthe-art tactical missile, designed and developed by the JV entity BrahMos Aerospace, has come a long way and achieved numerous milestones.

Rightfully reckoned as the world's fastest, best and deadliest weapon in its class, BRAHMOS has evolved from being an anti-ship weapon to a 'Universal' system having multiplatform deployability and multi-role capability to annihilate high-value ground and sea-based positions from stand-off ranges.

Today, BRAHMOS has made India the first and only nation in the world in possession of a supersonic cruise missile triad, ensuring Indian Defence Forces' formidable capability to undertake modern, highly complex, intense combat operations from across the spectrums of warfare. The missile has been actively deployed by the Indian Army, Navy and Air Force on their frontline platforms.

The development and evolution of modern precision-guided weapons has revolutionised warfare strategies and tactics in 21st century. The lethality of such weapons to undertake high-value combat missions with speed, precision and power has made them a sought-after asset to build a formidable military force. Supersonic cruise missile BRAHMOS - the unparalleled leader among worldwide precision strike weapons - has strengthened its position over the years owing to its incredible features of high speed, pinpoint accuracy, deadly firepower, stealth and universality. A finest product of high-technology military cooperation between India and Russia, BRAHMOS has charted a spectacular journey since its inception over two & a half decades ago.

#### **Redefining New-Age Missile Technology**

Since its maiden successful test firing conducted on June 12, 2001 from a land-based launcher in anti-ship mode, to subsequently being developed and tested in land-to-land, land-to-sea, sea-to-land, sea-to-sea, subsea-to-sea, air-to-sea and airto-land configurations, BRAHMOS has redefined new-age technology

involving precision guided missiles. Capable of cruising at a top speed of Mach 2.8, the 3-ton weapon can operate in hi-low trajectory and straightaway bang on its target with very high precision without giving any time or scope to the adversary's air defence system to react. The immense kinetic energy released by the powerful weapon can reduce high-value targets into simthereens in a very short time. The missile has also established its 'salvo' launch capability wherein more than one BRAHMOS can be fired in guick succession in one or different directions to knock down a single or multiple targets with pin-point accuracy.

Featuring a modular design, BRAHMOS can be seamlessly integrated onto modern ground, ship and underwater platforms to swiftly engage enemy positions from beyond radar horizon ranges. The 'fire & forget' missile can operate in day-and-night, all-weather conditions. It can be swifty deployed from

divergent ground terrains and from sea-surface combat platforms at a very short notice.

#### **Fortifying Modern Maritime Strike** Capability

The Indian Navy in 2005 became the first force to deploy the deadly BRAHMOS to undertake maritime combat missions. The naval variant has evolved into a powerful system and validated its anti-ship and land-attack capability from frontline warships, thus incredibly sharpening India's maritime strike and antisurface warfare capability. Powerful BRAHMOS has thus fortified Indian Navy's precision strike capability from both littoral and high-sea zones.

The ship-based BRAHMOS Weapon Complex offers wide-ranging strike options - sea-to-sea, seato-land, land-to-sea, subsea-to-land, subsea-to-sea, air-to-sea, air-to-land in modern, multi-threat maritime combat environment. As a mutli-role system, BRAHMOS has also proved its capability to be fired from a static or mobile naval platform in solo or salvo mode in vertical or inclined configurations to engage single or multiple targets located in different directions.

In its anti-ship configuration, BRAHMOS can cruise at a very low trajectory above the sea-surface and can launch surprise attacks on enemy positions. Also deployed in land-attack

![](_page_26_Picture_17.jpeg)

## BRAHMOS **SUPERSONIC CRUISE MISSILE**

World Leader in **Cruise Missile Family** 

### MULTIPLE PLATFORMS . MULTIPLE MISSIONS

SEA

**Maximum Engagement Radius Network Centric Capabilities Minimum Deployment Time** 

![](_page_26_Picture_23.jpeg)

![](_page_26_Picture_25.jpeg)

### BRAHMOS AEROSPACE

16, Cariappa Marg, Kirby Place, Delhi Cantt., New Delhi - 110010 INDIA

![](_page_26_Picture_28.jpeg)

Tel.: +91-11-42285000 Fax: +91-11-2568482 Website: www.brahmos.com Mail: mail@brahmos.com

![](_page_27_Picture_0.jpeg)

configuration on India's warships, the missile has proved its power to precisely engage targets deep in-land from stand-off ranges. The land-based mobile coastal batteries armed with BRAHMOS can take on key enemy positions across land, coast and sea.

An underwater variant of the weapon tested successfully in March 2013 has validated the missile's flexibility to be integrated onto conven- to accurately engage and neutralise tional attack submarines in future.

The Indian Defence Ministry has recently awarded major contracts to BrahMos Aerospace to deliver the supersonic cruise missile systems to and coastal defence prowess.

#### An Unparalleled Weapon For Modern Land Warfare

BRAHMOS land-attack version has been deployed with the Indian Army improvised and enhanced over the years and deployed in advanced Block I, II and III versions for divergent, complex land warfare operations. Indian Army, in fact, is the first and only land force in the world which has actively deployed a very high-end precision guided weapon of such class and calibre.

test firing missions, the BRAHMOS LACM variants have proved their distinct capability to meticulously engage and annihilate ground-based positions and installations in varied combat environments, thus fortifying the Army's battle readiness.

#### **BRAHMOS-A – Deadliest** Weapon for Air Combat Operations

On November 22, 2017, the highly advanced air-to-surface configuration of BRAHMOS made a worldrecord feat when it was successfully test fired for the very first time from the Russian-origin Sukhoi-30MKI fighter aircraft of Indian Air Force (IAF) against a sea-surface target off India's eastern coast. This milestone mission made India the first and only nation in the world in possession of a 'supersonic cruise missile triad.'

The highly coveted BRAHMOS airlaunched weapon development programme was jointly undertaken by

the scientists and technocrats of India and Russia who modified the original anti-ship BRAHMOS configuration in order to integrate it onto the Sukhoi-30 air combat platform. After validating its capability to engage naval targets from large, stand-off ranges in day & night, all-weather conditions, BRAHMOS-air-launched cruise missile (ALCM) subsequently proved its power strategic ground-based target during a successful test launch mission conducted by the IAF from India's Car Nicobar Islands on May 22, 2019.

On January 20, 2020, Indian Air bolster the Indian Navy's maritime Force raised the 'Tigersharks' squadron consisting the BRAHMOS-armed Su-30MKI strike fighter platform to keep a 'strategic vigil' over the Indian Ocean Region ensuring peace, tranguillity and prosperity.

Today, BRAHMOS ALCM has since 2007. This variant has also been become the most powerful conventional air-borne weapon worldwide in terms of outreach, lethality and combat capability.

> The weapon's incredible precision attack capability against targets on the ground and ocean surface has helped build a credible combat capability for the IAF.

During a number of successful ous milestones to its credit, 'universal' BRAHMOS has garnered a lot of interest among many nations across the world.

#### Eteching Global Footprint

On January 28, 2022, BrahMos Aerospace signed a historic contract with the Republic of Philippines to deliver BRAHMOS shore-based antiship weapon system to the Armed Forces of Philippines. The landmark export deal positioned the supersonic the battlefields of tomorrow. /RA&MG/

cruise missile as India's first full-scale weapon system to enter the international market and propelled forward the country's aspiration to emerge as a world-class manufacturer and supplier of top-end military products and systems in the international market.

'BRAHMOS is a very versatile product combining superior technologies, unique design parameters and superlative performance records. It is a powerful force-multiplier for modern, net-centric combat operations. The weapon offers a very high-end, cost effective solution to fortify military stature of a nation,' according to Outstanding Scientist Atul D Rane, Director General, BrahMos, DRDO

and CEO & MD, BrahMos Aerospace.

After the first export breakthrough, BrahMos JV has intensified its efforts to further expand its global footprint. 'We have advanced in our negotiations with a number of countries across Continents and are hopeful to ink our next export contract very soon,' says the BrahMos Chief.

#### **BRAHMOS-NG to Revolutionise Battlefields** of Tomorrow

The India-Russia JV enterprise, in Having recorded all these illustri- the meantime, has initiated work on BRAHMOS-NG (next-generation) - a more advanced, stealthier variant of existing BRAHMOS.

Owing to its smaller, lighter, smarter dimensions, BRAHMOS-NG would cruise at a higher speed of Mach 3.5 and could be seamlessly integrated onto a wider number of modern military platforms on ground, sea, underwater and air in more numbers.

This newest precision-guided missile variant promises to revolutionise

![](_page_27_Picture_26.jpeg)

# THE FUTURE OF THE AEROSPACE INDUSTRY **DUBAI** AIRSHOW

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#### STRATEGIC PARTNER

![](_page_27_Picture_33.jpeg)

![](_page_27_Picture_34.jpeg)

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13-17 NOVEMBER 2023 DWC, DUBAI AIRSHOW SITE

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# **IDEX & NAVDEX 2023**

The world's biggest international defense and security exhibition IDEX traditionally was held in Abu Dhabi, UAE. The exhibition is held biennially and attracts increased attention both of weapons manufacturers and customers from armies of many countries. This is one of the most important international exhibitions in the world. This year, the IDEX was celebrating the 30th anniversary. Russia has been a permanent exhibitor at this one of the most representative international defence and security shows starting from the first exhibition in 1993. Rosoboronexport, part of the Rostec State Corporation, organized a large-scale display of Russia's leading defense industry enterprises in the country's pavilion at IDEX 2023.

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th IDEX-2023 International Conference and Defence Exhibition was held from 20 to 24 February

in Abu Dhabi. In this anniversary year, more than 1350 exhibitors from 65 countries took part in the IDEX and, visitors - up to 130,000 people.

'Middle East countries are Russia's ing a lot of military-technical cooperation projects in the region,' said Rosoboronexport's Director General Alexander Mikheev. 'Today, we are

busy working out proposals for the forms of partnership that could be of immediate interest to Middle East nations-primarily related to technolo- More than 200 full-scale models of gy transfer, joint R&D, and application of offset programs. Rosoboronexport is considering options for joint design and manufacture of cuttingaccording to the organizers' estimates, edge high-tech products, including there were more than twice as many a fifth-generation fighter based on the Checkmate light tactical aircraft, further work on the development traditional and important partners. and production of air defense sys-Rosoboronexport is implement- tems, equipment for the Navy, and weapons for the Army.'

Russia's joint display at IDEX 2023 was in a separate pavilion, where Rosoboronexport and Russian

defense industry firms showcased the latest high-tech military products for all services of the armed forces. armament, ammunition and military gear were on display for the guests and visitors of the Russian pavilion.

Representatives of the Army were shown weapon stations for equipping various armored vehicles, in particular, a full-scale model of the AU-220M 57 mm multipurpose remote weapon station. In addition, visitors of the Russian pavilion could see the T-90MS MBT and the Sprut-SDM1 light amphibious tank, the TOS-1A heavy flamethrower system, the BMPT tank support fighting

vehicle, the BMP-3 infantry fighting vehicle, including a version equipped with a new remote weapon station, the BT-3F armored personnel carrier, as well as explosive reactive armor (ERA) systems. Most of the vehicles have proved themselves in the tested in actual combat operations cision carbines. against terrorist groups.

At IDEX 2023, Rosoboronexport and Rostec-affiliated enterprises demonstrated Russian-developed missile and artillery weapons. Among them were the Iskander-E theater missile system, the 9K515 (Tornado-S) multiple rocket launcher system, the Khrizantema-S and

Kornet-EM ATGM systems.

Visitors of the Russian pavilion were able to get acquainted with the Typhoon-family MRAP wheeled armored vehicles, remote-controlled and Uran-6 robotic mine-clearing systems, small arms, modern individual protection and gear sets for army and special forces units, as well as ammunition for armored vehicles, artillery and missile systems, and close combat weapons. Among others, the Krasnopol and Kitolov-2M advanced guided artillery projectiles were offered to the partners.

As part of its small arms stand, Rosoboronexport displayed a wide

range of Kalashnikov assault rifles, including the AK-200 series, the AK-12, AK-15, AK-19 and AK-308, the Chukavin sniper rifle, as well as ORSIS-branded civilian and lawenforcement weapons: the ORSIS-375ST sniper rifle and the ORSIS region and have been successfully F-17M and ORSIS 12.7 mm high-pre-

> For the Air Force, Rosoboron export showed at IDEX 2023 the Checkmate light tactical aircraft, the Ka-52E and Mi-28NE attack helicopters, and the Mi-171Sh military transport helicop-

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ter. A broad range of modern weaponry for them, including the Item 305E and Vikhr-1 guided missiles that have proved their effectiveness against armored vehicles, also were on display. Visitors of the Russian pavilion were also be able to see the Orion-E, Orlan-10E and Orlan-30 aerial drones.

Russia's air defense systems are well known worldwide for being effective against any current and emerging air threats. Rosoboronexport is ready both to

![](_page_29_Picture_1.jpeg)

supply separate systems and to assist friendly states in building a national layered air defense system.

A wide range of anti-aircraft missile systems of various ranges and purposes were presented to partners at the exhibition. Almaz-Antey Air and Space Defense Corporation showcased in Abu Dhabi the S-400 Triumf and Antey-4000 long-range SAM systems, the S-350E Vityaz and the Viking medium-range SAM systems, as well as the Tor short-range SAM systems of various modifications. High Precision Systems, a Rostec subsidiary, displayed the Pantsir-S1M SPAAGM system and the Verba MANPADS.

A variety of radars also were on display at IDEX 2023, includ- the high-speed amphibious assault

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ing unique solutions developed by Russian designers: the Sula space surveillance radar, the Gamma-DE medium/high-altitude acquisition radar, the Kasta-2E2 low-altitude radar and the P-18-2 Prima radar capable of effectively detecting current and emerging low-observable aerial targets, including any stealth aircraft.

Russian counter-drone systems, in particular the Repellent, Repellent-Patrol, RLK-MCE, RB-504P-E and RB-504A-E, as well as the Pischal-PRO portable system exhibited at the Rosoboronexport stand, had a great deal of attention.

In the naval segment of the exhibition, Rosoboronexport showed boat BK-10, the high-speed transport landing boat BK-16, and the Rubezh-ME coastal defense missile system.

During the exhibition, Rosoboronexport made a number of public presentations of the armaments and military equipment on display in the Russian pavilion. The AU-220M 57 mm multipurpose remote weapon station and the Ka-226T light multipurpose helicopter, a full-scale model of which was exhibited in the outdoor area. Two other presentations, Modern Russian-Made Small Arms and Layered Non-Strategic Missile Defense System, were scheduled too respectively.

As part of the IDEX 2023 business program, Rosoboronexport had meetings and talks with representatives of the armed forces and other security agencies of the United Arab Emirates and other Middle East countries. In addition, industrial partnership projects were actively discussed with the region's leading defense product manufacturers.

Russian Rostec Corporation was one of the biggest exhibitors at the IDEX-2023. Its products were demonstrated at the individual Russian Pavilion with an area of about 1,000 m2 in the IDEX maritime space. At the IDEX-2023, Rostec primarily showed the latest weapons and military equipment, from small arms and precision-guided weapons to armoured vehicles, airplanes and helicopters. Visitors of the Russian Pavilion could see more than 200 models of weapons and military equipment, ammunition and gear with about 150 of them developed by Rostec's companies.

Tornado-C MLRS control unit was one of the premieres of the IDEX-2023. The unit enables an individual flight mission to be programmed for each particular missile. Thanks to this development, the combat vehicle can hit multiple targets in one shot. The control unit for Tornado-S was developed on the basis of a strapdown inertial navigation system and can assign both flight distance and path to each individual MLRS missile. Guided rocket range is more than a hundred kilometers. Tornado-S rocket accuracy is 15 to 20 times higher than that of its predecessor - Smerch MLRS.

Also, 122mm unguided rockets for Tornado-S MLRS were shown at the exhibition. They are capable of engaging targets behind the terrain folds (back slopes, canyons, etc.) and in mountains. Engagement performance of these rockets is several times higher than that of standard Grad unguided rockets. 53-UOR-281U 57mm high explosive tracer round was another premiere at the IDEX-2023. It is designed to hit air targets, unarmored vehicles and personnel. This ammunition is applicable with the common weapon station mounted on various land vehicles and navy ships.

Some air defence systems were represented by Pantsyr-S1M surfaceto-air and anti-tank missile system and Verba shoulder-held surface-toair missile – a successor of famous Igla – which has twice as high performance as its predecessor. Visitors could also see the T-90MS tank, explore the BT-3F armored personnel carrier, BMP-3M infantry fighting vehicle, TOS-1A heavy flamethrower system and Terminator TSFV tank support fighting vehicle.

The aviation part of the Russian exposition space included the Checkmate light tactical aircraft and II-76MD-90A (E) strategic airlifter as well as the Ka-52E and Mi-28NE com- State Corporation, showed 1K144-E bat helicopters and the Mi-171Sh military utility helicopter.

Kalashnikov Concern showed brand-new small arms - the PPK-20 Kalashnikov submachine gun and Chukavin sniper rifle (ChSR). The PPK-20 named after Victor Kalashnikov, the son of the legendary designer, was primarily designed for special detachments. The gun may be outfitted with a quickdetachable silencer, various modern sighting systems and other equipment and uses any Russian and foreign 9x19mm cartridges. Modern user-friendly design and ergonomics of the submachine gun also attract foreign customers. The new Chukavin sniper rifle (ChSR) also meets all latest ergonomics, design and modern sight system requirements while combining these specifications with the reliability of the Dragunov rifle proven over decades. The ChSR is already being fielded in the Russian Army.

Kalashnikov Concern also presented a new active protection system for light armored vehicles made by Research Institute of Steel, Kalashnikov Concern. The system is based on the 4C24 explosive reactive armor (ERA) module. It essentially differs from the 4C20 offered on the market before. Its properties prevent detonation of the adjacent modules when the module is hit by a grenade. Previously, engagement of one ERA module resulted in failure of several adjacent modules and, thus, an unprotected armor area increased. The new module signifi-

cantly improves the armored vehicle survivability on the battlefield.

The system still ensures protection against grenades penetrating up to 500mm of steel armor from any fire direction. The guaranteed shelf life of ERA has been increased by half. The 4S20 module required replacement after 10 years, the 4S24 ERA requires replacement after 15 years. The 4S20 and 4S24 modules are interchangeable. Their dimensions and weight are the same and the performance of an existing system with the 4S20 ERA may be improved just by replacing the modules.

Ruselectronics Holding, Rostec space-saving discreet-surveillance reconnaissance and alarm system for the first time at the IDEX-2023 International Defence Exhibition in Abu Dhabi. The system can detect enemy personnel and land vehicles, classify and count objects, and identify the direction of motion while remaining completely unnoticed.

The 1K144-E consists of seismic, infrared and magnetic intrusion detectors up to 20cm in size and 150g to 600g in weight. They are buried in ground, hidden in terrain and ensure continuous operation from built-in batteries during up to 30 days. System deployment time does not exceed 5 minutes.

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The data from the sensors is sent via a radio channel and displayed on the operator's terminal in the form of an electronic terrain map indicating the locations of detectors and detected objects. The equipment can 'see' moving targets, identify their type, calculate the travel and motion path. The system range is: for infantry -30 meters, for wheeled vehicles - up

to 120 meters, for tanks or infantry fighting vehicles - up to 200 meters. The equipment has been developed and is manufactured by Sozvezdie Concern as part of Ruselectronics.

Another Ruselectronics' development - the Pishchal-Pro drone gun is one of the lightest systems on the anti-UAV market. The system is

mobile, does not need deployment and can immediately suppress links of any drones used for reconnaissance and conduct of combat. The Pishchal-Pro operates in five frequency bands at a time and engages

Russian Helicopters holding, Rostec State Corporation, presented Mi-171A3 offshore helicopter in the capital of the United Arab Emirates. Chemezov, CEO of Rostec State At the IDEX-2023 in Abu Dhabi there was a world premiere of a new rotary-wing aircraft designed for oil and gas companies. The advanced aircraft is designed to deliver passengers and cargo to offshore platforms and

for servicing remote offshore platforms should catch the interest of the UAE because the majority of the UAE's oil is produced offshore.

The Mi-171A3 satisfies the demands of oil and gas compatargets at a range of more than 2 km. nies, both domestic and foreign, and meets the IOGP (International Association of Oil & Gas Producers) standards,' pointed out Sergey Corporation. The Mi-171A3 is furnished with the advanced airborne avionics, which ensures safe overwater flying when no natural landmarks and satellite signal are available even in poor visibility conditions.

to perform open water search and rescue operations. The Mi-171A3 has unique transportation capabilities in the offshore class. With a maximum takeoff weight of 13 tons, this rotarywing aircraft is able to carry up to 4 tons of cargo or up to 24 passengers. The flight range with auxiliary fuel tanks is up to 1000km.

'The Middle East traditionally shows high interest in our helicopters. These are primarily Mi-8/17 aircraft, but Russian Helicopters holding is taking extensive efforts to promote new types of civil aircraft on this market. The Mi-171A3, from our point of view, has a high export potential. This advanced offshore helicopter designed for overwater flights and

The helicopter meets the strict overwater flight safety requirements. The aircraft has an emergency ditching system with two airbags to ensure helicopter buoyancy in case of an emergency landing on water. Passengers and crew are evacuated in two liferafts with a capacity up to 27 people each.

Moreover, the Mi-171A3 has the state-of-the-art navigation equipment, digital autopilot and airborne collision avoidance system. A new reinforced body with extensive use of composite materials has been designed for the helicopter. The upgraded main rotor system includes an X-shaped high-performance tail rotor and main rotor with composite blades. Fail-safe fuel tanks are located in bottom body bays under the cargo-passenger cabin floor to increase the helicopter safety.

In Abu Dhabi Russian Helicopters holding also showed Ka-226T light utility helicopter. The rotary-wing aircraft features maneuverability and flexibility - the convertible helicopter has a modular design. The operator will be able to transform the passenger air vehicle into medical service or cargo aircraft during half an hour without outside assistance.

The upgraded Ka-226T is a light two-engine gas turbine helicopter designed for cargo, passenger and service personnel carriage, economic zone patrolling, monitoring, search-and-rescue and medical evacuation operations. Design features of the upgraded Ka-226T allowed to reduce the weight and to improve the performance of the rotary-wing aircraft: payload and range were increased.

Several helicopter configuration options have been developed: passenger, cargo, emergency rescue, medical, patrolling, assault and VIP. The assault option can carry up to seven passengers, ambulance cabin accommodates two patients on stretcher and two accompanying medical persons. In addition, the casualty pod may be replaced with a cargo platform, crane and erection set-up, agricultural hopper with aerochemical pest control spreaders and other equipment packages. Flexibility ensures high demand for the aircraft and cost efficiency. With seasonal nature of operations, the operator can avoid equipment downtime or the purchase of more than one expensive aircraft with different options.

The Almaz-Antey Concern presented its line of major military products at the IDEX-2023. At the Concern's stand, visitors could obtain information about modern long-, medium- and short-range air defense systems, modernization options for previously produced equipment and other developments, as well as the holding's capabilities to train foreign specialists.

The holding presented products from eight of its subsidiaries

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as part of a single exposition. In particular, models of S-400 Triumf long-range surface-to-air missile systems (SAMs), S-350E Vityaz medium-range SAMs, Viking SAMs, Buk-M2E SAMs, as well as shortrange Tor SAMs (Tor-M2E, Tor-M2K, Tor-M2KM) and Taifun-PVO (E) antiaircraft artillery combat vehicle.

Visitors of the exhibition got acquainted with Antey-4000 SAM system, Tunguska-M1 SAMG system, ZSU-23-4 Shilka-M4 SAMG system, simulators and target training complexes for air defense specialists training, as well as the Concern's capabilities in modernization and repair of previously supplied equipment. In addition, the information about the shipborne anti-aircraft equipment was provided: Rif-M, Resurs, and Shtil-1 air defense systems

The Concern's exposition also featured radar, reconnaissance, and surveillance equipment, models of air target acquisition radars Gamma-DE, Kasta-2E2, Barrier-E, and others. In addition, Concern specialists presented the Podsolnuh-E OTH radar.

A special place at the exposition was taken by the model of the Sula space object surveillance radar, which allows to track the movement of satellites, space debris and other objects in orbit at a range of up to 6,000 km. The radar provides acquisition of coordinate and non-coordinate information on space objects, which is recorded on non-transitory media and is transmitted in real time to the user.

The radar antenna is built on the basis of a modular digital active phased antenna array, which provides the radar with high information characteristics, bandwidth and noise immunity. The peculiarity of 'Sula' is the compact size of the antenna array and the sectional-modular principle of architecture that allows to deploy the radar on the ground and move it by rail in a short time. The station is controlled from a command and control center made in a fast-mounted module.

For IDEX visitors the Concern also presented a model of the Podlet-E automated three- coordinate lowaltitude radar, which has high noise immunity and is capable of operat-

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ing in various modes of space surveillance. 'Podlet-E' is intended for use in automated and non-automated air defense and air force units for automatic (semi-automated) detection, position measurement, tracking, identification and flight information acquisition of air objects and prospective low-altitude air defense weapons, including those made by stealth technology in conditions of forested moderate terrain and under intensive active, passive and combined jamming as well as fire suppression conditions.

Traditionally, portable radars for surveillance of ground targets were of great interest to the visitors. Concern's specialists demonstrated ground surveillance radar stations 'Fara-VR', 'Credo-1E', 1L277, 'Aistenok' and facility protection radar 'Sova'.

The Concern also presented models of the E-801E helicopterbased radar system for detecting air and surface objects and the 1K130E helicopter-based ground target surveillance radar system. In addition, at the exposition of Almaz-Antey there was a model of ROSC-1 radar. It designed to counter unmanned aerial vehicles. Separate monitors showed information about the samples and models on display, including the Adjutant universal target training system and the 9F678M autonomous simulator. RA&MG

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On February this year the AERO INDIA 2023 International Aerospace Exhibition - one of the leading aerospace exhibitions in Southeast Asia - took place at the Yelahanka Air Force Station in Bengaluru, India. AERO INDIA is being held biennially since 1996. The organizers of the exhibition this year were: the Ministry of Defence of the Republic of India, the Department of Defence Industry of the Ministry of Defence of the Republic of India, as well as aircraft building company 'Hindustan Aeronautics Limited' ('HAL'). Rosoboronexport (a unit of Rostec State Corporation) was the organizer of Russia's collective display at the AERO INDIA 2023 International Aerospace Exhibition.

he total area of AERO INDIA 2023 was more than 28,000 sq. meters. The largest national exhibitions were represented by Russia, India, France, Israel and the United States of America. In all, there were participations from more than 30 countries.

The main subjects of AERO INDIA 2023 were: military aviation, aerospace industry, security systems, civil aviation, unmanned aviation, air defence means, equipment for airdromes and airports, ground service technologies and others.

Before AERO INDIA 2023 Dmitry Evgenyevich Shugaev, FSMTC of Russia Director, said to our maga- manufacturers, it is an opportunity zine: 'The International Aerospace Exhibition AERO INDIA is one of the largest and most authoritative exhibition venues in its class along with similar venues in London, Paris and Moscow. It brings together the world's major companies involved in the development and production of aerospace equipment for both civil and military purposes.

Participation in it allows to demonstrate the achievements of the Russian aviation industry to the global community, in particular, to the fast-growing countries of South and South-East Asia, which have a large market. For Russian aircraft

to establish closer contacts with their Indian colleagues, find new points of contact, which can later result in promising joint projects.

We are well aware that given the state of affairs in India's defense industrial complex and New Delhi's current approaches to building military-technical cooperation with foreign countries, additional opportunities to strengthen our own position in the Indian arms market are offered to countries that can provide India with financial and credit support, buy equity in Indian defense enterprises and organize production of modern military products in India

with a right to their subsequent reex- ter, Su-57E perspective multifuncport.

With this in mind, we are trying to build our work in the Indian direction. A striking example of this work is the activities of the joint organization contract for the delivery of missile systems produced by this organization to the Philippines. Negotiations are underway with a number of countries for their delivery.

We expect that the products of the joint venture 'Indian-Russian Rifles' will be no less successful. Work is underway to start production at the joint venture 'Indian- Russian Helicopters' of Ka-226T helicopters.

Russian companies are ready to participate in Indian programs to develop and produce advanced main battle tank and infantry fighting vehicle. In addition, joint researches and development in the military- at the AERO INDIA 2023. technical field are being carried out in more than 40 areas. All this allows exhibitor at AERO INDIA, one of the us to look confidently into the future of Russian-Indian military-technical cooperation.'

Within the framework of the Russian exposition at AERO INDIA 2023, which was organized by Rosoboronexport, the following equipment and weapon were represented in the forms of models and other advertising.

Air Force equipment: II-76MD- Rosoboronexport Director General. 90A(E) military transport aircraft, Ka-226T light multipurpose helicop-

tional fighter.

Air Defence equipment: 125-mm self-propelled anti-tank gun (SPRUT-SDM1 light amphibious tank), combat vehicle on wheeled chassis for BraMos - in 2022 we signed the first Pantsyr-S1 air defence missile-gun system, Tor-M2KM air defence missile system, Igla-S manportable air defense missile system.

> Army Equipment: T-90MS tank, BMPT tank support combat vehicle, TOS-1A heavy flamethrower system.

> Rocket and artillery weapons: 300mm 9K515 multiple launch rocket system, Kornet-EM antitank guided missile system, Iskander-E tactical ballistic missile system.

Small arms: Kalashnikov assault rifles and machine guns of various caliber and modifications.

And now here is some more information about Russia's participation

'Rosoboronexport is a permanent world's largest air shows, where the Russian display traditionally stands out for its scale and the range of exhibited products for the Air and Air Defense Forces. The exhibition gives us an excellent opportunity to showcase modern Russian-made weaponry and discuss the areas for further bilateral cooperation with India,' said Alexander A. Mikheev, between Russia and India is an exam-

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ple of industrial partnership with a number of completed and ongoing joint projects for all services of the armed forces. Today we are offering new points of cooperation within the joint development and production of high-tech products on the premises of Indian enterprises under the national Make in India program in compliance with all localization and technology transfer requirements.

Russia's collective display includ-'The military-technical cooperation ed the stands of Rosoboronexport, United Aircraft Corporation (a unit

HMOS

![](_page_32_Picture_1.jpeg)

of Rostec), and Almaz - Antey Air and Space Defense Corporation. Delegations of Russia's major enterprises manufacturing products related to the thematic areas of the exhibition also worked at Aero India.

In India, Rosoboronexport was exhibiting about 200 advanced Russian-made samples of armaments and military hardware, including the advanced Su-57E fifthgeneration multifunctional fighter, the Checkmate light tactical aircraft,

the IL-76MD-90A(E) military transport aircraft, the IL-78MK-90A tanker aircraft, the Su-35 and the Su-30SME super-maneuverable fighters, and the MiG-35D multifunctional frontline fighter.

Rosoboronexport also presented the Ka-226T light utility helicopter, the production of which is suggested to be launched under the Make in India program on the premises of Indo-Russian Helicopters Limited, a joint venture with the participation

of Russian and Indian industrial companies.

In addition, a wide range of various Russian military helicopters was demonstrated at AERO INDIA 2023. Among them were the upgraded versions of the Ka-52E and Mi-28NE attack helicopters and the Mi-171Sh military transport helicopters, which are in strong demand on the world market and in the Asia-Pacific region today.

Visitors of the Rosoboronexport display could see Russian unmanned aerial vehicles, including the Orion-E reconnaissance/strike UAV, the Orlan-10E reconnaissance UAV and the Orlan-30, a new product launched in 2022.

In the air defense segment, Rosoboronexport showcased the entire range of assets that can operate both independently and as part of an echeloned air defense system. Russia's collective display exhibited the S-350E Vityaz air defense missile system, the Viking, Tor-M2KM, Tor-M2E SAM systems, and the Pantsir-S1 self-propelled anti-aircraft gun/missile (SPAAGM) system. In addition, the company offered the Igla-S and Verba man-portable air defense systems. Russian-made anti-drone systems, including Repellent, RLK-MCE, RB-504P-E and RB-504A-E, also were demonstrated on display.

As part of AERO INDIA 2023 business program, Rosoboronexport

ROSOBORONEXPORT

was held substantive meetings and negotiations with representatives of the Ministry of Defense and other security agencies of India and other countries of the Asia-Pacific region. In addition, the company had extensively meetings with stateowned and private enterprises of the Indian defense industry with a view to expanding the scope of industrial partnership between Russia and India in accordance with the requirements of India's flagship programs Make in India and Self-Reliant India.

Russian United Aircraft Corporation (UAC) was one of the biggest at the Aero India 2023 International Air Show. 'India is our long-time partner, a great number of Russian aircraft is used here, therefore, the maintenance of the existing aircraft and supply of new aircraft are essential. Aero India is one of the key regional platforms intended for discussion of these issues and is a great opportunity to maintain communication with our partners,' said Yury Slyusar, General Director of UAC.

'UAC acts as a single company for the first time internationally - last year, UAC was amalgamated with two leading Design Bureaus – Sukhoi and MiG, and with factories in Lukhovitsy, Novosibirsk, Komsomolsk-on-Amur and Nizhny Novgorod. The form of communication between the cor- countries. poration and its partners becomes

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craft market. This is an urgent need of Indian partners and a necessary component of the growing strategic cooperation between the two

Almaz – Antey Air and Space Defence Corporation demonstrated in Bangalore a number of products that have positively proven themselves in the global market within a single exposition. In particular, models of S-400 'Triumf' long-range and S-350E 'Vityaz' medium-range air defense systems were presented to the public.

The S-400 Triumf SAM system is designed for high-performance defence against air strikes, strategic, cruise, tactical and operational ballistic missiles, as well as medium-range ballistic missiles under conditions of combat and electronic countermeasures.

The S-350E Vityaz SAM system is designed to defend administrative, industrial and military facilities against massive strikes by various types of modern and advanced air

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The Runway to a Billion Opportunities

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simpler and clearer, UAC uses a one-

stop-shop approach now.

Development of an integrated after-sales service system for Russian aircraft, which forms a significant potential of the Indian Air Force, is one of the key priorities of the growing UAC presence in the Indian air-

attack weapons, including those operating simultaneously from any direction, from extremely low to high altitudes. S-350E can operate independently or be integrated into the customer's air defense system.

In addition, the guests of the exhibition could see the Tor fam-

ily of short range air defense missile systems (Tor-M2K, Tor-M2E, Tor-E2, the Tor-M2KM autonomous combat module on the Indian TATA chassis and others) and the Taifun-PVO (E) anti-aircraft artillery fighting vehicle.

For the first time in India the Corporation presented the 98R6E Abakan nonstrategic ballistic missile defence system designed to engage modern and advanced tactical and operational-tactical ballistic missiles. The system consists of 98L6E multifunction radar and 51P6E2 launchers (up to four); it is a reliable means of fighting the most dangerous ballistic targets and allows to engage targets both as part of an air defence force and on its own.

Visitors of AERO INDIA also could see models of aerial surveillance radars 'Kasta-2E2', 'Gamma-

DE' and 'Podlyot-E'. These radars are successfully used for acquisition, coordinate measurement, tracking, identification of air targets and promising air attack weapons, including those made with stealth technology,

under intensive active, passive and combined jamming, as well as fire suppression.

The specialists of the Corporation also told the exhibition visitors about naval air defense systems. The information about Shtil-1, Resurs, and Rif-M sea-launched SAMs, Moskit-E and Moskit-MVE shipborne missile weapon systems, and Podzagolovok-24E equipment for ensuring electromagnetic compatibility of shipborne radiotechnical means was presented at the Corporation's stand.

Besides, Almaz - Antey Corp. presented information about the REDIKOM mobile repair and diagnostic equipment set. In addition to the above products at the Corporation's exposition visitors could get acquainted with the characteristics of the universal target training complex 'Adjutant', which features the possibility of multiple use of targets imitating the main modern means of air attack.

'India has one of the largest, strongest and most modernized armies in the world, and Indian partners tra-

![](_page_33_Picture_5.jpeg)

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A state-of-the-art member of the family, the Tor-M2KM, stand-alone combat module lacks chassis whatsoever. Due to this, the Tor-M2KM module is much lighter than the Tor-M2E combat vehicle (15 tones vs 37 tones), cheaper and has many features that are not available to wheeled and tracked versions.

In terms of its reconnaissance and firing capabilities the Tor-M2KM is cantly lower, thus the money saved fully compatible with the Tor-M2E. In one revolution of the antenna it can detect up to 48 targets at a range of by a helicopter, it can be placed in 32 km, rank them according to the threat level, pick 10 most dangerous for auto tracking and engage simultaneously four of them. The reac- Mounting the Tor-M2KM on rooftops tion time from target detection to SAM launch is 5-10 seconds, with 3 sec spanning between launches. The maximum kill range and altitude is 15 km and 10 km respectively. The course parameter is ±8 km. The sys- the interception point to the far end tem is capable of intercepting small targets with a RCS of below 0.1 m2, flying at ultra-low altitudes (10 m and below). The radio-command method of guidance makes it possible to plot different target trajectories including diving, as well as to guide SAMs to flying airborne threats is retained the most vulnerable parts of the tar- due to both the curvature of the get. The Tor-M2KM's powerful radars are noted for their high accuracy that excludes firing one target with two SAMs and provides reliable jamming immunity. During trials in Greece

Tors were not suppressed by NATO EW. Russian EW did not manage to overcome the SAMS, either,

The lack of chassis makes the Tor-M2KM a point defense asset of choice. One module can cover up to 176 km2. When defending stationary assets such as military bases and airfields, the requirements for mobility of air defense facilities are signifion the chassis can buy more SAMs.

As the module can be airlifted hard-to-reach places - in the mountains, on the roofs of buildings, etc. where few SAMs will be able to get. for covering industrial clusters and other assets will enhance the acquisition range, reduce effect of such factors as the terrain and surrounding buildings and ultimately move of the envelope, something to consider when it comes to the protection against debris from downed air attack weapons, notorious for casualties and destruction. At the same time, the possibility of engaging low earth's surface and the fact that the Tor family SAMs can aim at targets in the lower hemisphere in a narrow, but sufficient sector at a negative elevation angle with the guidance

developments of our Corporation, which have repeatedly demonstrated and confirmed their high performance, efficiency, reliability and competitiveness,' said Vyacheslav Dzirkaln, Deputy CEO of Almaz -Antey Corp. for Foreign Economic Activities. He emphasized that this was due to the powerful innovative, scientific, technical and production potential of the enterprises and organizations that are part of the Corporation as the leading integrated structure of the Russian defence industry.

ditionally show great interest in the

According to Vyacheslav Dzirkaln, another focus of the Almaz – Antey Corporation's delegation at AERO INDIA 2023 was to inform potential partners of the holding about the Corporation's capabilities to develop, manufacture, maintain, extend the service life, as well as modernize and recycle manufactured products.

The Izhevsk Electromechanical Plant Kupol as a member of Almaz -Antey Air and Space Defense Corporation has presented a wide range of its defense products at the AERO INDIA 2023 exhibition, namely the Tor-E2, Tor-M2K, and Tor- M2KM SAM systems in three configurations: stationary, vehicle and semi-trailer mounted, as well as the Typhoon-AD combat vehicle of MANPAD antiaircraft gunners.

The SAMS of Tor family are at the top of the best air defense systems in the world, having unparallel performance characteristics. Combat vehicles boast fast deployment (3 minutes, a world record as of today) which allows to repel a surprise attack; high speed of airspace surveillance (1 antenna revolution per second that also makes it second to none) for prompt reaction in a fluid situation; fast acquisition-toengagement reaction time standing at 5-10 sec that increases the probability of intercepting low-flying targets always detected after air threats flying at medium and high altitudes. Besides, the Tor-M2E, Tor-M2K, and Tor-E2 are the only short range AD systems in the world capable of firing on the move. Its high performance characteristics have repeatedly been proven by numerous trials including those conducted by foreign customers, as well as in combat. It should be kept in mind that the Kupol company as a key developer and manufacturer of the Tor family sticks to a responsible marketing policy, always putting down the proven performance characteristics in ads and documents. Thus, record figures can be much higher and Tors have repeatedly demonstrated it in trials and combat.

Full-fledged mockups of the prod-

ucts were demonstrated at Almaz -

Antey's joint exposition.

#### 70 YEARS OF SUCCESS

sector provided from -5° to +85°. Summing up the capabilities of the Tor-M2KM, it owes its versatility to the decision to abandon standard chassis in the design. RA&MG

![](_page_33_Picture_20.jpeg)

![](_page_34_Picture_0.jpeg)

# **DEFENSE 2022**

At the end of last year, VIETNAM DEFENCE 2022, Vietnam's second international exhibition and conference of weapons and technologies, was successfully held in Hanoi. The venue of the exhibition was Gia Lam Airport in the capital city. The exhibition was organized by the Ministry of National Defense of the Socialist Republic of Vietnam and the Ministry of Public Security of the Socialist Republic of Vietnam. Spread over 50,000 square meters (pavilions) and more than 10,000 square meters (open area), VIETNAM DEFENCE 2022 attracted more than 170 defense companies and companies from 30 countries. Rosoboronexport JSC (part of Rostec State Corporation) is the organizer of Russia's single exhibit at the Vietnam Defence 2022.

![](_page_34_Picture_3.jpeg)

IETNAM DEFENCE 2022 was an international exhibition and conference on defence field in Viet Nam, hosted by the Ministry of National Defence with the aim of supporting Defence units and armed forces to deploy the assurance of weapons and technical equipment to protect country as well as widen opportunities for manufactories, OEM assembly and supplier in the world to introduce equipment, weapons, high-end technologies

At the VIETNAM DEFENCE 2022 were showcased and display fighting vehicles, high-end equipment and systems technologies served for Air forces, Navy, grand forces, communication, biochemistry such as Fighter aircraft system, helicopter, missile

systems, submarine, warships, torpedoes, weapons systems, military vehicles, radar systems, reconnaissance robots, logistics facilities, etc and all the fields related to leaders, senior officials and soldiers belonging to defense, security, police and armed forces. The exhibition bcame the place for the best suppliers in terms of equipment and services in the world in order to meet, exchange and evaluate products, technologies and giving new Defence and security solutions for Vietnam and regional countries as well.

Defence and military leaders from ASEAN and other countries together with the senior leaders of major agencies and units under Ministry of National Defence of Viet Nam and Viet Nam People's Army, thereby received an unprecedented networking opportunity for all defence vendors, stake holders and partners.

VIETNAM DEFENCE 2022 offered a comprehensive programme that was featured exhibits on display, live demonstrations, seminars and personal interaction. It was where exhibitors showcase their latest products, technologies and services, further ment agencies and end-users, share mend solutions to operational problems together with cultural activities to introduce the country and people of Vietnam.

'Russia and Vietnam build their relations on long-standing traditions of friendship and mutual respect. Rosoboronexport supports the development of bilateral strategic

NG QUỐC TẾ VIỆT NAM 2022

Viette

![](_page_34_Picture_10.jpeg)

partnership and makes every effort to strengthen military-technical cooperation between our countries,' said Alexander Mikheev, Director General of Rosoboronexport. 'The company takes part in the Vietnamese defense exhibitions with great pleasure and presents the best Russian industrial products there. At Vietnam Defense 2022, we will show our partners develop their linkages with procure- the latest planes and helicopters, armored vehicles, air defense assets, technical know-how and recom- small arms and unmanned aircraft systems.'

> The Russian single exhibit included more than 400 military, civilian

#### 70 YEARS OF SUCCESS -

and dual-use products developed and manufactured by leading Russian enterprises, including those affiliated to Rostec.

At its booth, Rosoboronexport exhibited a full-scale model of the Orlan-10E unmanned aerial vehicle (UAV), as well as a line of Russianmade UAVs, including the Orlan-30, a new product of 2022, the Orion-E reconnaissance/strike unmanned aircraft system and the Kub-E loitering munition

Visitors to the exhibition were presented with the Su-57E fifth-gen-

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![](_page_35_Picture_1.jpeg)

![](_page_35_Picture_2.jpeg)

eration fighter, Su-35 and Su-30SME supermaneuverable fighters, IL-76MD-90A(E) military transport aircraft, Ka-52 scout/attack helicopter, Mi-171SH military transport helicopter and the Ka-28 shipborne ASW helicopter.

Rosoboronexport offered the Buk and Tor surface-to-air missile (SAM) systems, Pantsir-S1 self-propelled anti-aircraft gun/missile (SPAAGM) system, Verba and Igla-S man-portable air defense systems (MANPADS) suitable for building up air defenses at various levels. Electronic warfare assets, including those designed to counter various unmanned aerial vehicles, were also be on display.

At the Rosoboronexport booth, delegations of the Armed Forces of Vietnam and the countries in the region geted acquainted with the

ambulance, as well as to consider options for organizing their licensed production on the territory of partner countries.

The Kalashnikov Concern presented its products as part of Rosoboronexport's exhibit. Kalashnikov is the manufacturer of the most popular and well-known brand of small arms in the world showcased its AK-200 series, AK-15 and AK-19 assault rifles that meet all modern requirements for ergonomics and are suitable for mounting various sights and tactical accessories. The company's partners made interested in other Kalashnikov products as well: 9mm Kalashnikov PPK-20 submachine gun, Chukavin sniper rifle, 9mm Lebedev pistol.

Visitors to the special exporter's booth were great attention to small arms from other well-known Russian manufacturers, including 5.45mm and 7.62mm KORD assault rifles, 9mm PP-19-01 submachine gun.

Rosoboronexport presented a wide range of naval products: the Gepard-3.9-class frigate, Project 22160 patrol ship, Project 21980E special purpose craft, as well as the Karakurt-E and Sarsar small missile ships. At its booth, representatives of the Navies of the countries in the region finded a wide range of missile, artillery and torpedo armament for ships and subma-During Vietnam Defense 2022, rines, air defense assets, communications, sonars, underwater/ surface target acquisition sensors, anti-saboteur capabilities. /IA&TG

![](_page_35_Picture_10.jpeg)

Among the vehicles on display

from Southeast Asia increased atten-

have excellent capabilities to cross

various models of Typhoon-type

mine-protected vehicles and Linza

### **Project 636** Large diesel-electric submarine **Black hole** Tested and reliable submarine you can trust

- Powerful and well-balanced armament;
- Low noisiness, small sonar and radar trace:
- High survivability and reliability;
- Well-mastered building technologies;
- Substantial service experience in different fleets around the world.

Project 636 is the further development of the world-famous Kiloclass submarines.

Being based on rich experience and the best Russian traditions of the submarine shipbuilding Project 636 has been nicknamed 'Black hole' for its low noisiness.

If compared to the third-generation foreign competitors, the submarine has proved its high reliability and better noisiness, firepower, weapons stocks and floatability specifications.

The submarine is effective against groups of ships and can efficiently search for submarines and destroy them. Project 636 as well can deliver strikes against critical land facilities and set minefields.

![](_page_35_Picture_21.jpeg)

![](_page_35_Picture_22.jpeg)

70 YEARS OF SUCCESS

#### Armament

Club - S integrated missile system: Range of fire, km - 300. TE-2 torpedoes: Range of fire, km - 50. MGK-400EM sonar. MRK-50E radar Project 636 submarines provide reliable protection of the State from underwater and surface threats. It is a strong force to maintain peace. Main characteristics:

- Displacement surface/submerged, t ..... 2450/3670
- Main dimensions (length, beam, height), m 73,8/9,9/7,15
- Operating depth, m ..... 300
- Speed submerged/surface, kts. ..... 19/11
- Range using diesels/batteries, miles ..... 7500/400
- 533 mm torpedo launching units, un..... 6
- Ammunition load for 533 mm launching units,

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![](_page_36_Picture_0.jpeg)

### Ka-52 **Combat scout-attack helicopter Aerial leader**

Highly-maneuverable helicopter is armed with powerful armament complex and is capable to execute any combat task with high efficiency.

ВВС РОССИИ

![](_page_36_Picture_3.jpeg)

![](_page_36_Picture_4.jpeg)

70 • Russian Aviation & Military Guide

Ka-52 Combat Scout Attack Helicopter is designed for destruction of tanks, armored and non-armored vehicles, enemy's manpower and adversary helicopters in the front line or in tactical depth. The helicopter provides transfer of target reconnaissance, target distribution and target designation data to interacted helicopters and command posts of Ground Forces.

Ka-52 has a high combat survivability and combat power, it can be operated round-the-clock, it has a wide range of aerial weapons and high It is the only helicopter in the world that is equipped with the Ejection & Shock absorbing System.

#### Main characteristics

<ul> <li>Normal takeoff weight, kg</li> </ul>	
Max speed, km/h	
Maximum climb-rate, m/s	
Service ceiling, m	5.500
Hovering ceiling, m	
Range (with internal fuel tanks), km	

![](_page_36_Picture_10.jpeg)

## **Mi-171Sh** Military transport helicopter **Up-to-date configuration of the legendary helicopter**

The most modern version of the Mi-17 military helicopter with the improved flight and operational characteristics, high survivability and flight safety as well as powerful unguided and guided armament complex.

Mi-171Sh military transport helicopter is designed to perform deliv- Main characteristics ery of manpower, transportation of cargoes and materials inside the cargo cabin or on the external sling as well as for airdropping of tactical troops, airlanding of reconnaissance and sabotage groups and destruction of ground objects.

The helicopter can be operated for medical evacuation, delivery of the emergency medical healthcare onboard, provision of the search and rescue missions in combat conditions. Mi-171Sh features high transport capabilities, it can be effectively employed in special opera tions, it is self-sufficient and has an out-of-hangar storage capability.

![](_page_36_Picture_15.jpeg)

#### 70 YEARS OF SUCCESS

![](_page_36_Picture_17.jpeg)

![](_page_36_Picture_18.jpeg)

	Max takeoff weight, kg	.13.500
	Max external payload weight, kg	.4.000
	Max speed, km/h	.280
	Service ceiling, m	.6.000
	Range, km:	
	with main fuel tanks	.610
	with two internal additional fuel tanks	.1065
-	◆ Cargo cabin volume, m <sup>3</sup>	.23
	Paratroopers carried in cargo cabin	37

![](_page_37_Picture_1.jpeg)

![](_page_37_Picture_2.jpeg)

### **Pantsir-S1** Anti-aircraft missile and gun system

### Perfect protection of any object

Mobile, multi-channel short-range air defense system has high firepower and is able to effectively engage a wide class of air attack weapons

'Pantsir-S1' AAMGS is distinguished by the presence of combined missilecannon weapons, a short reaction time and the ability of a combat vehicle to conduct reconnaissance and destruction of air targets in motion.

'Pantsir-S1' anti-aircraft missile and gun system is designed for air defense of small military and administrative-industrial facilities and areas, including mobile ones, against fixed- and rotary-winged aircraft, cruise missiles, and precision munitions as well as for strengthening air defense units against massive air strikes.

#### Main characteristics:

Firing distance to the airplane with radar cross-section area of 2 sq. m and target speed of 300 m/s:

By missile:	
range	.1200-20000 m
altitude	15-15000 m
◆ By gun:	
range	200-4000 m
altitude	0-3000 m
Number of simultaneously engaged targets	4
The maximum speed of engaged targets	1000 m/s

![](_page_37_Picture_11.jpeg)

## 'Igla-S' Man-portable air defense system *Compactness. Mobility. Convenience of combat application*

Implementation of the principle of 'shoot-and-forget', high survivability and stealth of combat work.

High universality of the system allows you to launch missiles using: starting mechanism;

'Dzhigit' support launcher;

 'Strelets' set of equipment and launch modules (allow launching missiles from various mobile carriers);

- 'Komar' turret installation;
- 'Gibka-S' combat vehicle of MANPADS squad.

'Igla-S' man-portable air defense system is designed to defeat all types of visible fixed- and rotary-winged aircraft on head-on and in pursuit courses as well as small aerial targets like cruise missiles around the clock under induced thermal and background noise.

#### Main characteristics:

• Range	
Altitude	
Target speed:	
head-on	up
in pursuit	up
• Ready for operation on a signal while on the march	1920
Ready for launch after activation	

Missile features tracing, passive, infrared bi-spectral seeker

#### 70 YEARS OF SUCCESS

SYSTEM ACLASS

![](_page_37_Picture_25.jpeg)

) to 6000 m to 3500 m

to 400 m/s to 400 m/s 12 seconds . 5 seconds

![](_page_37_Picture_31.jpeg)

### **Project 22800 Karakurt Compact power** Great capabilities with low displacement

- Considerable fire power;
- Ensuring tactical supremacy;
- Strong Air Defence;
- Solving of the tasks in times of piece.

Despite its lower class, the firepower of a Karakurt corvette can be compared to a frigate.

Karakurt class ships are capable of achieving and maintaining maritime supremacy of an assigned sea area and of delivering highprecision missile strikes against critical land facilities located at the depth of an enemy's territory.

Multichannel anti-aircraft artillery-missile system ensures strong defence of a ship from all types of aerial attack means.

In time of peace Karakurt class ships are able to maintain order in littoral areas.

#### Armament

Club - N integrated missile system: Range of fire, km – 300; Missile load - 8 missiles.

![](_page_38_Picture_12.jpeg)

Pantsir-ME AA missile-artillery system:

Range of fire of missiles/artillery, km - 20/5;

Ammunition load of missiles/gun rounds, un. - 32/1000.

Artillery gun mount AK-176MA-01 1x1 76,2 mm:

Range of fire, km - 15,7.

Pozitiv-ME 1.2 3D radar:

Detection range of an air target, km - 150.

Mineral-ME radar:

Detection range of a sea-surface target, km - up to 450. MR-123-02 Bagira fire control radar system.

Incorporating of Project 22800 Corvettes to the Navy will result in substantial increase in fire power of the fleet at low cost.

#### Main characteristics:

- Main dimensions (length, beam), m ......67x11

- Endurance, days..... 12

![](_page_38_Picture_31.jpeg)

### **Project 11356 Multipurpose Frigate Reliable defender**

Powerful dynamic combat ship tested in ocean

![](_page_38_Picture_34.jpeg)

- Well mastered building process;
- Universal ship of the ocean area;
- Ship with a modern spirit;
- Design is meeting high standards.

With relatively low displacement the Frigate has well-balanced armament capable of providing effective protection of escorted ships from air, sea-surface and underwater attacks. The ship as well can carry out search for sea-surface and underwater targets and destroy them. The frigate is also able to deliver high precision missile strikes against critical land facilities.

Excellent maneuverability, seaworthiness and habitability are meeting high standards of seafarers.

In time of piece Project 11356 is capable of controlling compliance with the State's interests in distant sea areas and carrying out international missions of maintaining piece and international order

Efficient main power plant ensures ship's high running speed as well as sufficient endurance and range.

3S14 universal launching units serve as the main impact missile weapon. 3M-54TE, 3M-14TE and Yakhont missiles can be used with the system.

#### Armament:

Chem MILLING BORD BOA .....

Club-N integrated missile system: Range of fire, km – 300; Ammunition load - 8 missiles. Shtil-1 multichannel ADMS: Range of fire, km - 50; Ammunition load - 24 missiles

#### 70 YEARS OF SUCCESS

	A-190E-01 100 mm artillery gun mount:
	Range of fire, km – 22;
	Two AK-630M 30 mm artillery gun mounts:
	Range of fire, km – 5.
	Two Paket E/NK anti-submarine systems with 327 mm torpedoes:
	Range of fire, km – 20;
	Ammunition load - 2x4 327 mm torpedoes.
	Fregat-M2EM 3D Radar:
-	Detection range, km – 300.
	5P-10-03 Puma fire control radar system.
	MGK 335EM-03 sonar system.
	A hangar and a helipad for a 12 t helicopter.
-	Incorporating of Project 11356 Frigate to the Navy will result in
	enhanced operational capabilities in an open sea or ocean
;	Main characteristics:
	Full displacement, t
	Main dimensions (length, beam, draught), m 124,8x15,2x4,2
1	Maximum speed/economical speed, kts
	• Range, miles
	Endurance, days30
	Seaworthiness, points

490

### **RUSSIA – BILLION OPPORTUNITIES** FOR DEFENSE COOPERATION

The topics of military-technical cooperation projects being implemented by Russia and the latest export-oriented developments of the Russian military-industrial complex have always been the focus of national and specialized media in all regions of the world - from Latin America to East Asia. In recent years, starting from 2015, the Army International Military and Technical Forum has been of particular interest. The combat use only increased interest in Russian weapons. We offer an overview of the landmark publications of the global media. **HEERING** 

he 20th anniversary of Rosoboronexport in 2020 was an occasion for many foreign media to summarize the results of many years of work to promote Russian military products for export.

November 4th marks 20 years since the establishing of Rosoboronexport, which today is the only state intermediary in Russia for the exports and imports of the entire range of products, technologies and services of military and dual use. In accordance with the single-window principle, Rosoboronexport is empowered to export and import not only military equipment for armed services, but also dual-use and civilian products. In the background of the coronavirus pandemic, ROE not only fully fulfills all its obligations to customers, but also continues to regularly introduce to the global market new models of weapons, military equipment and civilian products, as well as expands the practice of industrial partnership, reported Asian Military Review (Thailand).

![](_page_39_Figure_5.jpeg)

It made focus on the promotion of high-tech civilian and dualuse products on the global market as a promising new field of activity for Rosoboronexport.

Much attention draw the Russian defense exporter's 2023 announcement on the launching of a global marketing campaign for 15 new military products developed and manufactured in Russia.

Defense Mirror (India): 'New Russian equipment and weapons for which export permits have been issued will be presented by Rosoboronexport at international defense exhibitions, during meetings and negotiations with partners, and on fast-growing digital platforms. The company has agreements with most manufacturers to jointly promote products in foreign markets'.

Among the 'long-awaited' novelties are the Orlan-30 UAV, Ballista remote-controlled weapon station module, Chukavin sniper rifle, UAV countermeasures systems, new underwater weapons, communications equipment, training simulators, motor and armored vehicles.

'The pavilion was overflowing with enthusiasts snapping selfies with the poster boy of Russia: the AK-47, popularly known as

## [N] UAE 0 Idex 2021: Smile for a souvenir photo with a tank or Kalashnikov

Kalashnikov. A spokesman for the Russian company was explaining to curious visitors how to use the weapon of choice for many militaries (and militias) around the world. Another man politely handed out a branded flag to passers-by, as part of his marketing effort. The company is among hundreds of other defence firms from all over the globe who descend on Abu Dhabi every other year for the International Defence Exhibition (Idex), wrote the National (UAE) on the Russian participation at IDEX 2021 expo in Abu Dhabi.

#### **ARMY-2022**

![](_page_39_Picture_14.jpeg)

he Army-2022 International Military and Technical Forum expo in Russia found significant coverage in the global media. Journalists from leading military-technical media from different countries came to Kubinka to see Russia's major defense expo with their own eyes.

'The opening ceremony of the exhibition was attended by Russian President Vladimir Putin, and more than 1,500 Russian and foreign defense industries companies displayed nearly 28,000 military and civilian products within the framework of the exhibition... ARMY 2022 will be the eight edition of the fair and will end on August 21. According to statements made by the Russian army, 36 government contracts worth \$8.6 billion are expected to be signed

![](_page_39_Picture_17.jpeg)

with Russian and foreign defense industry companies,' reported India DefenseHere (Turkey) on the eve of the expo.

'As characteristic features of this Forum in Russia, capacities and developments related to information technologies, artificial intelligence, radio electronics, which can be beneficial for the products offered by the Federal Service for Technical Cooperation, will be exposed, wrote Spanish-language Defensa.

![](_page_39_Picture_20.jpeg)

It added, that in 2022 the expo was to be expanded with the presence of the Russian Navy, robotic systems in an environment called Roboarmy and the commitment to technologies that reduce pollution and affect environmental safety.

The Aviation & Defense Universe (India) reported during the expo, that Rosoboronexport was hosting more than 70 delegations from 50 countries representing various regions of the world during the 8th ARMY 2022 International Military-Technical Forum.

'The company offers its partners a broad range of products, systems and solutions for establishing armament systems for state law enforcement agencies, many of which have a real combat track record. In addition, Rosoboronexport is ready to implement joint projects on the development and production of promising types of weapons, technology transfer. Russia remains a reliable business partner open for technology cooperation with foreign customers, guoted the Aviation & Defense Universe Alexander Mikheev.

![](_page_39_Picture_24.jpeg)

The Indiandefenceindustries.in (India) payed special attention to the joint action program, approved by Rosoboronexport and Uralvagonzavod.

Indiandefenceindustries.in: 'The program is aimed at coordinating the marketing efforts by both companies in external markets and India in the defence sector as both countries looked to deepen to promote modern Russian armored vehicles, missile, rocket and their military and economic ties. artillery weapons and interact with foreign customers on mod-Indian Aerospace & Defense Bulletin: 'Rosoboronexport, the ernization and maintenance of the earlier supplied weaponry and Russian state intermediary agency for exporting and importing military equipment'. defence-related and dual-use products, has presented a range of

#### 70 YEARS OF SUCCESS

he military-technical cooperation between Russia and India is a great example of successful industrial partnership with a number of completed and ongoing joint projects for all services of the armed forces.

'Today we are offering new points of cooperation within the joint development and production of high-tech products on the premises of Indian enterprises under the national Make in India program in compliance with all localization and technology transfer requirements, guoted global media Alexander Mikheev, Rosoboronexport Director General, on the eve of Aero India 2023 expo.

'Russia is seen as being the only country transferring technology for the production of modern weapons to the Indian side, unlike Western countries cooperating with India in the field of defence products. This technology transfer is clearly visible in the activities of the BrahMos Aerospace joint venture, which received technology from the Russian side to produce BrahMos multi-purpose supersonic missiles,' reported Indian Aerospace & Defense Bulletin (India) in an article with a title that speaks for itself - Russian Military Equipment of Indian National Interest At Aero India 2023.

![](_page_39_Picture_34.jpeg)

'Russian military products supplied in the interests of Asian partners are distinguished by high reliability and durability in operating conditions in a tropical climate, which has earned its worthy reputation,' guoted Financial Express (India) head of the Federal Service for Military-Technical Cooperation of the Russian Federation Dmitry Shugaev.

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According to Indian Aerospace & Defense Bulletin, industry and strategic analysts viewed Rosoboronexport's participation in Aero India 2023 as indicative of the growing partnership between Russia

Russian military helicopters, unmanned aerial vehicles (UAVs), and air defence assets at Aero India 2023 in Bengaluru. The company is family of attack helicopters, which are widely known in Africa and highlighting the Ka-226T light utility helicopter, which it suggests could be produced under the 'Make in India' program at the Indo-Russian Helicopters Limited joint venture, which involves Russian and Indian industrial companies'.

FORCE (India) in its article Roadblocks to Aatmanirbharta summarized the significance of Russia-India military cooperation, saying that Russia is the only country willing to share some of its most advanced technologies with India.

FORCE Aero India 2023 | Roadblocks to Aatmanirbharta Despite efforts at self-reliance, tridle will continue to depend on

#### Africa

ub-Saharan Africa has become one of the growth leaders in the level and quality of military-technical coopera-tion with Russia.

Rosoboronexport has been developing mutually beneficial ties with practically all the states in the region, helping them strengthen their defence capabilities, sovereignty, and fight against organized crime and terrorism. At AAD 2022, we are showcasing about 400 of the best Russian products for all branches of the armed forces, police and special operations units, security equipment and cyber security solutions, as well as a wide range of civilian products, quoted **defenceWeb** (South Africa) Alexander Mikheev, during Africa Aerospace and Defence (AAD) 2022 expo.

defence Web	REUTECH products and services in	
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losoboronexport	sets its sights on	
frican market		A Statement
eranteal, the Say 2022	+17	GAZAGISA P.A.
The .	Russian state arms conglomerate Rosobor (missport to looking to expand to presence in Africa with a large	Divisio
- Canada	presence at AAD 2022.	
	"At 440 2022, we are choseneding almost 400 of the	THE STUDIES THE WEEK
	best number products for all blandhes of the arrival	SAPE looking at Armatte calibians

It pointed out, that Russia has been taking part in AAD since 2000 and views it as an important part of strengthening its positions in Africa.

Military Africa (Nigeria) in 2023: 'Russia is proving once again to be a strategic and reliable partner in Africa's defence and security landscape'.

Global Aviator (South Africa) has covered the latest developments in Russia's helicopter industry.

'Rosoboronexport demonstrated a full export lineup of Russian military helicopters with the focus being on the modernized Mi-35P and Mi-28NE attack helicopters.

The modernized Mi-35P is the latest development in the Mi-24 have proven their efficiency in the hot climate of the continent. The new Mi-35P retains all the original advantages of the Mi-24 but has the ability to operate at night and has an optimised armament composition. The helicopter is equipped with a new sighting station, digital autopilot, and multi-functional digital displays.

The Mi-28NE day/night attack helicopter is designed to search and destroy armoured and un-armoured vehicles, manpower and lowspeed air targets as well as to provide cover and fire support for the troops at any time of day. It is equipped with an integrated avionics suite providing round-the-clock employment of the helicopter and weapons,' wrote Global Aviator in its report on HeliRussia 2020.

![](_page_40_Picture_14.jpeg)

#### Aerospace Industry – **Fighter Jets and Heavy-lifters**

ukhoi Su-35 Gen. 4++ multi-role twin-engine supermaneuverable fighter jet took to the skies for the first time on 19th February 2008. The 15th anniversary in 2023 was covered internationally, specifically, by Asian media.

Asian Military Review: 'Today, Su-35S, along with Su-30SM, makes the backbone of the Russian Air Force, and is also one of the core products of the Russian aviation exports. Su-35 also incorporates some Gen.5 fighter jet technology. According to the manufacturer, it can give the Flanker-E+ an advantage over other multi-role 4th generation fighters... Su-35 was designed on the base of the renowned Su-27 fighter jet in order to dramatically increase its effectiveness against air, ground and surface targets. The family of export-oriented Sukhoi multirole combat aircraft now comprises Su-30SME, Su-34E, and Su-35 combat air platforms'.

![](_page_40_Picture_18.jpeg)

Asian Military Review added, that the Su-35 was reported to be capable of accomplishing the whole range of air support tasks, while a large number of hardpoints enabled the use of up to 12

medium-range guided air-to-air missiles or six air-to-surface guided 'The aircraft features improved specifications compared to the previous variants of the II-76. In particular, the flight range and the weapons in one sortie. 'The proposed concept for the Su-35, initially, was to provide payload capacity have been increased, as well as the accuracy of an export-oriented fighter jet from the 'latest' modification of the flight navigation and landing, and the quality of radio communica-Su-27 variant in terms of functionality, absorbing all the accumulattions. The ability of the aircraft to successfully perform tasks in harsh ed backlog in the Sukhoi Design Bureau in terms of new equipment environments (including the mountainous areas) is also enhanced by the ability to operate from unpaved airfields. and weapons. On the other hand, the Su-35 should be considered

as a kind of 'intermediate' fighter between the Su-27 family and the fifth generation fighter, the Su-57 Felon,' wrote in its analytical piece on Su-35 Indomiliter (Indonesia).

![](_page_40_Picture_22.jpeg)

In 2022 Indomiliter published an article on the anniversary of MiG-29's first flight.

'Today, 45 years ago, which coincided with October 6, 1977, became a historic moment in the world of global defense equipment, when the Soviet design bureau, Mikoyan-Guryevich, flew the MiG-29 prototype for the first time'.

![](_page_40_Picture_25.jpeg)

The Indonesian media reminded, that the latest development in MiG-29 line is MiG-35.

The transport aircraft segment has also drawn foreign media attention. For example, Arabian Defence in its 2022 Ilyushin II-76MD-90A (E): New Multi-Purpose Aircraft is ready for Export article performed an analysis of the latest Russian Ilyushin planes -II076MD-90A and II-78MK-90A.

![](_page_40_Picture_28.jpeg)

#### 70 YEARS OF SUCCESS

The plane can be converted into ambulance or fire-fighting versions... The II-78MK-90A tanker has improved aerial refueling equipment, can carry more fuel, and has a longer life. It can refuel up to four aircraft on the ground and one or two aircraft in the air. Apart from its main mission it can be converted into a transport plane'.

#### **Unmanned Export**

he theme of Russia's UAV export promotion has recently become another fresh and widely covered theme for the media.

Russia enters the UCAV league with its Orion-E drone was the title of India's Aeromag 2021 article on Orion-E unmanned aerial vehicle.

![](_page_40_Picture_37.jpeg)

'Russia has started the global market promotion of the Orion-E medium-altitude long endurance (MALE) reconnaissance/strike unmanned aerial vehicle. This seems to be a significant breakthrough for the Russian aero industry, which could look unlikely a few years ago'.

The KUB-E weapon system with guided munition also made many made many headlines.

Defense Mirror (India): 'The Kalashnikov Group's kamikaze drone KUB-E guided munitions system has received export permit form Russian authorities making it possible to promote this product abroad... During the first public display of the at the IDEX-2019 international exhibition in Abu Dhabi, the drone received significant interest from international military delegations visiting the event'. /RA&MG

![](_page_40_Picture_41.jpeg)

#### INTERNATIONAL AEROSPACE, MILITARY, NAVY AND TECHNOLOGY GUIDES IN 2023-2024

In 2023			
ISSUE	DEADLINE	ADDITIONAL DISTRIBUTION	
'GUIDE' №04 (72)	June 10th	IMDS-2023 (21-25.06.2023, Russia, Saint Petersburg)	
'GUIDE' №05 (73)	July 10th	MAKS-2023 (25-30.07.2023, Russia, Moscow)	
'GUIDE' №06 (74)	August 08th	ARMY 2023 (14-20.08.2023, Russia, Moscow)	
'GUIDE' №07 (75)	October 20th alytical o	Defense & Security 2023 (06-09.11.2023, Thailand, Bangkok)	
'GUIDE' №08 (76)	October 25th	Dubai Airshow 2023 (12-16.11.2023, UAE, Dubai)	
'GUIDE' №09 (77)	November 20th	EDEX 2023 (04-07.12.2023, Egypt, New Cairo)	

In 2024

ISSUE	DEADLINE	SPECIAL PARTNERSHIP
'GUIDE' №01 (78)	Januar <mark>y 18th</mark>	World Defense Show 2024 (04-08.02.2024, Saudi Arabia, Riyadh)
'GUIDE' №02 (79)	February 01th	DEFEXPO INDIA 2024 (February 2024, India)
'GUIDE' №03 (80)	March 01th	ArmHiTec 2024 (March 2024, Armenia, Yerevan)
'GUIDE' №04 (81)	March 20th	FIDAE 2024 (09-14.04.2024, Chile, Santiago)
'GUIDE' №05 (82)	March 20th	Eurasia Airshow 2024 (April 2024, Turkey, Antalya)
'GUIDE' №06 (83)	March 20th	SOFEX 2024 (April 2024, Jordan, Amman)
'GUIDE' №07 (84)	April 18th	DSA 2024 (06-09.05.2024, Malaysia, K.Lumpur)
'GUIDE' №08 (85)	May 05th	International Exhibition of National Security and Resilience 2024 (21-23.05.2024, UAE, Abu Dhabi)
'GUIDE' №09 (86)	May 10th	KADEX 2024 (23-26.05.2024, Kazakhstan, Astana)
'GUIDE' №10 (87)	August 01th	ARMY-2024 (August 2024, Russia, Moscow)
'GUIDE' №11 (88)	September 06th	Africa Aerospace and Defence 2024 (18-22.09.2024, South Africa, Pretoria)
'GUIDE' №12 (89)	September 10th	ADEX 2024 (24-26.09.2024, Azerbaijan, Baku)
'GUIDE' №13 (90)	October 15th	SOFEX 2022 (31.10-03.11.2022, Jordan, Amman)
'GUIDE' №14 (91)	October 22th	INDO DEFENCE 2024 (06-09.11.2024, Indonesia, Jakarta)
'GUIDE' №15 (92)	October 25th	Airshow China 2024 (12-17.11.2024, China, Zhuhai)
'GUIDE' №16 (93)	November 01th	Ideas 2024 (19-22.11.2024, Pakistan, Karachi)
'GUIDE' №17 (94)	November 18th	ExpoNaval 2024 (03-06.12.2024, Chile, Valparaiso)

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![](_page_41_Picture_21.jpeg)

# STRUNG SUPPORT

### Ka-52E Combat scout-attack helicopter

![](_page_42_Picture_2.jpeg)

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![](_page_42_Picture_8.jpeg)

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