RUSSIAN AVIATION & MILITARY GUIDE

Special analytical export project of the United Industrial Publishing

1(75), February 2024

The best defense innovations for the global market

WORLD DEFENSE SHOW SAUDI ARABIA

SPECIAL PARTNERSHIP

UIP
UNITED INDUSTRIAL PUBLISHING

'Russian Aviation & Military Guide'
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OFFICIAL GREETINGS

Special perspectives in all areas of security

It has already become obvious and undeniable that security is becoming increasingly important among the various values of civilization. Today, for any state, the ability to reliably and safely protect territory, inhabitants and values is a priority. And the Second World Defense Show (WDS) in Riyadh is a special platform of this truth.

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.

This exhibition shows that quality and capabilities are what really matter and the amount 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 ready for mutual work.

By participating in WDS 2024, Russia continues its policy of open partnership with Arab countries and its partners from around the world. Russia has a wide range of military and security products to meet all the needs of any region and is ready to offer the best technologies and best price offers for the whole world.

Valeriy Stolnikov

RUSSIA and SAUDI ARABIA STRENGTHEN WORLD SECURITY

Relations between the Russian Federation and the Kingdom of Saudi Arabia are on the rise and are characterized by high trust and mutual respect. Frequent meetings and telephone conversations between the leaders of both countries are clear evidence of this fact. Russian President Vladimir Putin's visit to Saudi Arabia last December and his talks with Crown Prince and Prime Minister of the Kingdom of Saudi Arabia Mohammed bin Salman Al Saud in the Saudi King's al-Yamamah Palace are a bright step towards strengthening and developing relations between the countries. This visit is called historic and a landmark in the world not only for the development of relations between the two countries, but also for the strengthening of world security.

At the meeting with Vladimir Putin Crown Prince and Prime Minister of the Kingdom of Saudi Arabia Mohammed bin Salman Al Saud said: 'We can find many topics and subjects of common interest, on which we are working together to promote stability and development around the world, including in the Middle East.

Over the past seven years, we have achieved a lot in our bilateral relations, for example, in the energy sector, investment and agriculture.

In addition, our political cooperation and interactions have had a positive influence on several Middle Eastern issues and helped enhance security. Moreover, our future political ties and cooperation will, no doubt, have a positive bearing on the international environment.

We have broad and far-reaching opportunities ahead of us, and by seizing them we can work together for the benefit of our nations and the entire world.

I would like to reiterate, Mr President, that you are a cherished guest here in Saudi Arabia. We welcome you on behalf of its government and its people.'

President of Russia Vladimir Putin said: 'Thank you. Your Highness, first, I would like to thank you for the invitation.

We expected to see you in Moscow. I know that the circumstances have affected these plans. But, as I said, nothing can prevent the development of our friendly relations. Indeed, being in this region on a scheduled visit to the United Arab Emirates, I used your invitation to come and see you and all our friends that we have been vigorously developing our interaction with over the past seven years.

That said, the next meeting will hopefully take place in Moscow.

Indeed, the Soviet Union was among the first to recognise the independent state of Saudi Arabia. This was almost a hundred years ago. Our relations have developed in different ways during this time. In any event, we respected the will of the subjects of Saudi Arabia to build their future independently.

Much has happened in our relations during this time, but over the past seven years, they have certainly reached a truly unprecedented level. This was achieved owing to the wise policy of your father, the Custodian of the Two Holy Mosques King of Saudi Arabia with your direct participation.

We have stable, very good ties in political interaction, the economy and in humanitarian area.

And, of course, it is now very important for all of us to exchange information and views on what is taking place in the region. No doubt, our meeting is timely. Thank you very much for your invitation, once again.'

On Vladimir Putin's proposal to hold the next meeting in Russia Mohammed bin Salman Al Saud answered: 'Of course, we are ready.' And Vladimir Putin said: 'Agreed.'

At the Conclusion of the Visit of Vladimir Putin to the Kingdom of Saudi Arabia a Joint Statement has been adopted.

In connection with this meeting, observers could not help but recall another meeting between the President and the Crown Prince, which was in June 2018 in the Kremlin, Moscow. At that time Vladimir Putin said to Mohammad bin Salman Al Saud: 'Your Highness, colleagues and friends, I am honoured to welcome you at the Kremlin. First of all, I would like to wish you a happy Eid al-Fitr, the holiday which

marks the end of the Muslim holy month of Ramadan.

Your Highness, we fondly recall the visit of King Salman of Saudi Arabia. Please, convey our best regards to His Majesty. His visit gave a powerful boost to bilateral relations, which are developing rapidly in politics and the economy. However, there is still much to be done here, though it is already clear that our cooperation is very effective and is benefitting both Saudi Arabia and the Russian Federation.

We are glad to see you in Moscow, including on the occasion of the World Cup opening and also because our teams are playing today.

You know about our warm feelings for you, but you will definitely understand my reluctance to wish success to your team. The strongest team will win. We stand for fair, open and beautiful sport. Anyway, we will both enjoy the masterful play of our athletes. I am delighted to see you.'

Crown Prince of Saudi Arabia Mohammed bin Salman Al Saud said: 'Your Excellency, I would like to thank you for your hospitality. I would also like to convey the warmest of greetings of the Custodian of the Two Holy Mosques. And I would like to say that the historic visit was successful and fruitful for both sides.

Over the past several years, we have come far in terms of developing bilateral relations. In many fields, too, as you have mentioned – political, economic, industrial, oil-related. I believe that this fruitful cooperation saved us from many dangers that were lying in wait for us.

I think that the whole world benefitted from this cooperation, as the volatility in oil prices, as well as other volatility occurring in this sphere, and the stabilisation achieved in this sphere helped to stabilise the entire global economy. The benefit to our two countries has been a benefit to all countries that use our energy. We have been witnessing this beneficial effect over the past several years. Undoubtedly, we would like to continue this cooperation and go even further.

Today, the historic agreement on OPEC+ is currently in place. Both OPEC and non-OPEC countries are working together. We hope that the first OPEC+ summit will be held in our country, in Riyadh, in your honour.

As for today's match between our countries' national football teams – may the best team win. No matter how this match ends, we will be happy, as our joint work in various spheres continues to be successful. Even if we lose, we will bring back to our country the political, economic and negotiating capital we have generated. If we win, this victory will cap the list of our other achievements.'

/RA&MG/

FSMTC OF RUSSIA

Dmitry Shugaev: 'The Arab states have traditionally shown interest in almost the entire range of the Russian 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. Before World Defense Show 2024 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.

– Mr Shugaev, how would you characterize the features of the development of the relations in the field of military-technical cooperation between the USSR and Russia with the Arab states?

– The military-technical cooperation with the states of the Cooperation Council for the Arab States of the Gulf during the Soviet era was rather restrained.

Thus, the diplomatic relations with Saudi Arabia were interrupted in 1938 and resumed only in 1991. The Intergovernmental Agreement on the Military-Technical Cooperation was signed only in 2008.

The interaction with the United Arab Emirates has been carried out for more than 50 years, and the first contacts in the military-technical sphere were established in the second half of the 1980s.

Considering the State of Kuwait, it can be noted that interaction in the military-technical sphere developed from 1977 to 1990 and was resumed in 1991 after a short break. During this time, the products were supplied as part of the repayment of the existing debt of the USSR from the availability of the Russian Ministry of Defence, as well as under the foreign trade contracts.

As for Bahrain, Qatar and Oman, the military-technical cooperation was established in the late 1980s – early 1990s. The supplies of military products were carried out under the foreign trade contracts.

Currently, an active dialogue is maintained between our states. The negotiations and consultations are held on a regular basis within the framework of the meetings of the intergovernmental commissions.

The contracts for the supply of various types of military products have been implemented and are being executed. In general, we have quite good prospects for increasing cooperation in this area.

Taking into account the current situation, characterized by the reorientation of the strategic interests of the Russian Federation from the West to the East, the military-technical cooperation with the Arab countries is acquiring a special character.

The leadership of many states in the region is ready to develop mutually beneficial relations with Russia. We, in turn, are taking measures to maintain and increase the achieved indicators of bilateral interaction with partner states. The military-technical cooperation with the Arab states is multifaceted. The bilateral consultations are being conducted in all areas of cooperation of mutual interest.

– In your opinion, what products of the Russian defence industry are most in demand in the Arab states today?

– The states of the region are one of Russia's key partners in the global arms market. They account for a significant portion of military exports.

The Arab states have traditionally shown interest in almost the entire range of the Russian military products. These include, among other

things, the aviation equipment, various air defense systems, the ground forces equipment, the anti-tank missile systems, as well as the small arms.

– What qualities of the Russian weapons and military equipment are especially valued in the Arab states?

– Of course, the main competitive advantage of the Russian technology, from the point of view of any foreign customer, is its optimal price-quality ratio. However, with regard to operation in the Arab states, we can add another important advantage of our weapons, which partners have noted during many years of experience in their use – high efficiency and excellent performance characteristics in difficult climatic conditions. It is the combination of the above characteristics that makes the Russian-made military products so popular among customers in this region.

In addition, the Russian weapons are distinguished by their reliability and high level of maintainability.

– What types of the latest Russian weapons and military equipment do we primarily offer to potential buyers in the region, including in Saudi Arabia?

– The most relevant types of the Russian weapons include weapons and equipment of the ground forces, the radar systems, various detection and electronic warfare systems against UAVs, the air defense systems, the aviation equipment, as well as close combat weapons.

– How actively are co-production programs developing in the Arab world? What technology are we talking about first?

– The Russian Federation is aware of the fact that in order to build an independent national defense industry, the Arab states are interested in the technology transfer, organizing the licensed production of the Russian military equipment on their territories, and training the competent personnel.

The Russian party always listens to the opinions and wishes of its partners and, in order to develop coop-

eration, is ready to discuss a variety of forms of interaction, without forgetting its own national interests, including those related to ensuring the protection of the results of the intellectual activity.

– What are the latest modernization programs for previously supplied the Soviet and Russian military equipment that are most relevant for the Arab states?

– The Russia's military-technical cooperation with the Arab states involves the after-sales maintenance of equipment and the supply of spare parts, as well as the creation of service centers and joint production facilities. Russia has a wide range of options that can be offered to foreign customers regarding the modernization of the previously supplied military equipment. Russia is ready to cooperate in this direction. Discussion of the bilateral cooperation projects in this area is carried out on an ongoing basis.

– How does the leadership of the FSMTC of Russia evaluate the site of the new exhibition – the WDS in Riyadh? How important is it for promoting promising Russian products in the region?

– Holding this exhibition in the Kingdom of Saudi Arabia provides many advantages, since the state is one of the twenty most developed states in the world.

The leading manufacturers of weapons and military equipment will gather at this exhibition for the second time. As we remember, in March 2022, the first International Defense and Security Exhibition the World Defense Show was held in Riyadh with great success both in terms of the scale of the exhibition and the fundamental tasks being solved. It fully justified the hopes placed on her and achieved her target indicators.

Russia also took a rather serious part in this event, demonstrating a wide range of classic developments of the Russian military-industrial complex, the latest models of the advanced military equipment and solutions for all types of the armed forces.

The upcoming exhibition will be no exception. I am confident that it will provide an opportunity for the Russian manufacturers of military products not only to demonstrate their modern achievements to colleagues and partners, but also to openly discuss the prospects for the military-technical cooperation.

Without a doubt, Russia's participation in the International Defense and Security Exhibition the World Defense Show 2024 will contribute to the further deepening of interaction between the Russian defense enterprises not only with the enterprises of the Kingdom of Saudi Arabia, but also the entire Middle East region, the development of the industrial and scientific-technical cooperation, as well as the military technical cooperation between our states.

– What is the basis for the confidence of the FSMTC of Russia in the constructive prospects and progressive development of relations in the field of the military-technical cooperation with the Arab states, including Saudi Arabia?

– The confidence of the FSMTC of Russia in the development of relations in the field of the military-technical cooperation with Saudi Arabia is based on the principles of mutual respect and friendship of sovereign states. The Kingdom of Saudi Arabia has been a reliable partner of Russia in general, including in the field of the military-technical cooperation for many years. The current stage of relations in the field of the military-technical cooperation is characterized by the development of the bilateral interaction with an emphasis on its cooperation component.

The cooperation with other Arab states at the present stage also has a special, trusting character and is progressively developing in various areas of mutual interest. **/RA&MG/**

RUSSIAN DEFENSE SECTOR CEO SHOOTS DOWN MYTH OF WESTERN ‘MILITARY SUPERIORITY’

Recent reports from the special op zone have shown that Russian troops continue to advance, thereby expanding their areas of control on all fronts. The main factor contributing to Moscow's success are the timely deliveries of advanced ammunition, drones, tanks, infantry combat vehicles, and artillery systems utilized by the Russian army.

Sergey Chemezov, CEO of Rostec Corporation (a state-owned defense conglomerate) recently sat down for an interview with Sputnik. Chemezov shed light on several key topics, including the rapid enhancement of Russian equipment through combat experience, the vulnerability of Western tanks, advancements in high-precision weapons and multiple launch rocket systems (MLRS), and innovative approaches to countering Ukrainian drone attacks.

Chemezov began by highlighting the fact that the extensive US-led support for the Kiev regime virtually has no tangible future. The amount of various weapons used by Ukraine's forces is rapidly dwindling.

‘Meanwhile, the Ukrainian military industrial complex is simply unable to compensate for the overwhelming losses. Foreign aid is shrinking before our very eyes. It seems Kiev’s Western donors are starting to realize their futility on this score,’ Chemezov noted.

Meanwhile, Russia has done a great deal of work when it comes to modernizing its military facilities long before the special op ever came to be. In fact, it entailed modifying capacities, and introducing up-to-date findings and technologies. The process covered multiple areas that ended up being extremely productive on the front lines.

Artillery and Tanks

As for manufacturing artillery shells, Russia’s overall production volume has skyrocketed by roughly 50 times, compared to 2021. The number of infantry fighting vehicles (IFV) and various armored fighting vehicles (AFV) has quintupled. That said, today the country produces nearly seven times the number of tanks, making Russia a global leader in this category.

Russian experts are meticulously examining 'trophy' samples of Ukrainian equipment. Some things are undoubtedly taken into further consideration, but on that score, it has become evident that the so-called military and technological superiority of the West is largely a myth.

‘They certainly have their strengths. However, Russian equipment is just as solid. Just take a close look at the number of ‘invisible’ tanks like the Leopards, Challengers and Bradleys that have failed to live up to their reputation on the battlefield,’ he emphasized.

Another widespread fallacy about Western weaponry is their supposed impenetrability. Reality has demonstrated that they burn down in batches, with Russian anti-tank guided missiles (ATGM) such as the Kornet or Khrizantema piercing right through them, like a hot knife through butter.

‘There truly is no exaggeration whatsoever when Russia’s tank-building tradition is described as the most advanced in the world,’ the CEO stressed.

The new and advanced T-90s, as well as the extensively upgraded T-72s and T-80s, are all currently operating in the special op zone. These vehicles have exhibited an outstanding performance. Take the Proryv tank, for instance, which stands as the premier mass-produced vehicle when compared to similar ones globally. Even Western specialists, albeit reluctantly, acknowledge its superiority.

Top-Notch Accuracy of Russia's Weapons and Drones

High-precision weaponry together with Russia’s latest drones have displayed remarkable effectiveness in the special op zone by targeting and neutralizing the enemy's armored vehicles, air defenses, and troops. An exemplary instance is the renowned Lancet drone.

‘Russia's military profile has been significantly enhanced recently, which is exemplified by the deployment of a universal planning and correction module that enables the transformation of free-falling bombs into guided ones. For example, Su-34 fighter bombers are now heavily deployed in the special operational zone against Ukrainian military facilities,’ the corporate executive added.

An exciting newcomer is the Koalitsiya howitzer that will ensure Russia’s offensive advantage over Western artillery. The first experimental and industrial batch is expected to be delivered to the front lines in late December 2023.

Cheremezov noted that ‘this year, Rostec enterprises finished working on a whole 'bouquet' of new artillery systems. In addition to the Koalitsiya-SV, the company has produced tha Malva 152 mm wheeled self-propelled gun, the Floks 120 mm gun, the Drok 82 mm self-propelled mortar, and the Derivatsia 57 mm anti-aircraft gun’. Each is unique in their own way.

Recently, Russian Defense Minister Sergei Shoigu noted that during the course of the special op, ‘Russia’s defense industry has shown its remarkable agility in creating new weapons in a matter of mere months’, like the KUB and Lancet drones, produced by the world-renowned Kalashnikov concern, as well as the Zemledelie remote mining system.

‘Thanks to such weaponry, the military operational zone has essentially become a highly inaccessible area for Ukrainian drones. They are being shot down by the dozens, struck by anti-aircraft missiles and neutralized by electronic warfare systems,’ the top company executive pointed out.

From www.sputnikglobe.com

Dear friends!

On behalf of Rosoboronexport, I welcome you and cordially congratulate you on the opening of the Second International Defense and Security Exhibition World Defense Show 2024 in the capital of the Kingdom of Saudi Arabia, Riyadh.

Today, Russia and Saudi Arabia have reached a high level of cooperation in the military-technical field, and relations between our countries continue to actively develop. Rosoboronexport gratefully accepted the invitation of the organizers to participate in one of the largest defense exhibitions in the Middle East and organized a display of advanced achievements and technologies of the Russian military-industrial complex for all branches of the armed forces.

The scale of the Russian exposition at the World Defense Show 2024 has increased by 50% compared to the area occupied by the country's enterprises at the first exhibition in 2022. Leading Russian holding companies, including those included in the Rostec State Corporation, are presented here – developers and manufacturers of weapons and military equipment tested in real combat conditions.

During the exhibition, Rosoboronexport will hold detailed presentations of Russian military, dual-use and civilian products, and will also discuss with representatives of the law enforcement agencies of the countries of the region issues of further mutually beneficial partnership in the field of supplies of weapons and military equipment, the creation of joint ventures, licensed production and joint development.

Rosoboronexport has enormous foreign trade competencies and experience accumulated over decades of work in the global market. We offer foreign customers the best examples of Russian military equipment, which have high competitive advantages in terms of their characteristics, quality and price. The Rosoboronexport catalogue is annually updated with dozens of new products with high export potential.

The company clearly monitors global trends, new challenges and security threats at various levels. We present products for all market segments. Our defensive systems are designed to protect the sovereignty of Russia's partners, repel any current and potential threats from land, sea, air and space, as well as combat terrorism.

Today the number of Rosoboronexport customers exceeds 100 countries. We work with more than 700 enterprises and organizations of the Russian military-industrial complex, the enormous capabilities of which allow us to offer comprehensive solutions that significantly increase the combat capability of the armed forces and other security forces of any partner state.

I invite guests of the exhibition and partners of Rosoboronexport to actively work and exchange opinions during the World Defense Show 2024.

Alexander Mikheev,
Director General of Rosoboronexport, JSC

AK-19

5.56mm Kalashnikov Assault Rifle

The Best of Both Worlds

AK-19 is the most modern Kalashnikov Assault Rifle for NATO caliber with time-tested gas-operated mechanics and augmented ergonomics.

The AK-19 has all new folding and adjustable buttstock made of shock-resistant polymer, new grip and a muzzle device. This iteration features increased accuracy due to a free-floating handguard, longer sighting line, aperture sight with windage adjustment and rigidly fixed top cover.

Picatinny rails allow the shooter to install various sights and tactical devices upon the shooter's preferences and training. The organic bayonet-knife, quick-attach suppressor, and compatibility with the GP-34 UBGL 40mm under-barrel grenade launcher tailors your AK-19 to the most challenging tasks. The assault rifle uses the whole variety of .223 Rem ammo (including FMJ and FMJBT) and organic RS101 with enhanced-penetration bullet makes it efficient against enemy manpower in body armour. Russian-made military-grade firearms undergo the toughest trials possible which guarantee their utmost reliability in any environment and AK-19 is no exception.

Main characteristics:

- Caliber: 5.56 mm
- Ammunition: 5.56x45 mm
- Empty weight: 3.6 kg
- Sighting range: 800 m
- Rate of fire: 700 rds/min
- Barrel length: 415 mm
- Length (min/max): 875/935 mm
- Length (with folded stock): 690 mm
- Magazine: 30 rds

Project 20382 Tiger

Multipurpose corvette

Primus inter pares

Proved effectiveness against surface ships, submarines and aerial targets

- Multipurpose, compact. Control over the ship is highly automated;
- Powerful and well-balanced armament;
- Build using composite materials and stealth technologies;
- Modular design.

Karakurt ensures effective defence of large surface ships, vessels and convoys from aerial, submarine and surface ship attacks.

The ship is capable of destroying critical land facilities, combat surface ships including those with a strong air defence.

Project 20382 as well can provide effective fire support for the Army and landing troops on the coast.

Armament

Club – N integrated missile system:
Range of fire, km – 300;
Missile load, missiles – 8.
RIF-M multichannel ADMS:
Range of fire, km – 40;
Ammunition load, missiles – 16.
A-190E artillery gun mount 1x1 100 mm:
Range of fire, km – 22.
Two AK-630M 1x6 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.
Zaslon-MFR multipurpose radar:
Detection range, km:
active channel – 200;
passive channel – 300.
Zaria ME – 03 sonar.

A hangar and a helipad for a 12 t helicopter.

Due to brand new technologies the combat potential of Project 20382 is not inferior to frigate class.

Main characteristics

- Full displacement, t 2430
- Main dimensions (length, beam, draft), m..... 104,5x13,0x3,7
- Maximum speed/economical, kts 26/14
- Range, miles 4000
- Seaworthiness, points 8

Amur-1650

Silent threat

Embodiment of the best Russian submarine building technological advancements

- Well-balanced and powerful armament;
- Low noisiness, small sonar and radar trace;
- Control over the submarine and armament is highly automated;
- Hi-tech are used.

Amur-1650 is the brand-new class of submarines, where the latest technologies and materials are used.

The submarine is effective against groups of ships and can efficiently search for submarines and destroy them. Amur-1650 as well can deliver strikes against critical land facilities and set minefields.

Low noisiness and perfect sonar system ensure pre-emptive detection of an enemy.

Armament

Club – S integrated missile system:
Range of fire, km – 300.
UGST torpedoes:
Range of fire, km – 50;
Ammunition load 533 mm, un. – 18.
Lira sonar system with a towed low-frequency antenna.
KRM-66E radar.

Acquisition of hi-tech Amur-1650 submarine extends the State's sea power.

Main characteristics:

- Normal displacement, t..... 1765
- Main dimensions (length, beam, height), m..... 66,8/7,1/6,7
- Operational depth, m 300
- Speed submerged/surface, kts..... 19/10
- Range using diesels/batteries, miles..... 6000/650
- Number of torpedoes 533 mm, un..... 6

S-350E ‘Vityaz’

Air Defence Missile System

Effective. Miltichannel. Multi-angle

The S-350E ‘Vityaz’ air defense missile system possesses high tactical and technical performace characteristics, allowing it to be used for the defence of administrative, industrial and military facilities from massive strikes of modern and advanced air attack weapons.

The air defence system is capable of simultaneously repelling strikes of various types of air attack weapons from any direction (circular mode) in the entire range of altitudes of their flight – from extremely low to high altitudes.

Types of engaged aerodynamic targets:

- aircraft of tactical and strategic aviation, including those made using the Stealth technology;
- cruise missiles;
- helicopters;
- unmanned aerial vehicles;
- aviation weapons.

Types of engaged ballistic targets:

- tactical ballistic missiles;
- operational-tactical ballistic missiles.

Main characteristics

- Range of engagement (max / min):

aerodynamic targets:

SAM 9M96E2 ..... 120 / 2.5 km
SAM 9M100E ..... 15 / 1.5 km
ballistic targets with SAM 9M96E2..... 25/5 km

- Altitude of engagement (max / min):

aerodynamic targets:

SAM 9M96E2 ..... 25 / 0.01 km
SAM 9M100E ..... 8 / 0.01 km
ballistic targets with SAM 9M96E2..... 20/2 km

- Maximum speed of engaged targets ..... 2000 m / s

- Maximum number of simultaneously:

engaged aerodynamic targets 16
engaged ballistic targets 12
guided missiles at aerodynamic targets..... 32
guided missiles at ballistic targets..... 24

T-90MS

Major Player on the Battlefield

Cutting-edge solutions in Armoured Vehicles' design merged with combat experience for your undisputed dominance on the battlefield.

The T-90MS MBT is equipped with powerful weapon systems, modern automatic fire control systems, cutting-edge protection, robust and powerful engine, and reliable transmission.

- The 125mm cannon allows to engage targets at long distances with high accuracy, and keeps the MBT from the enemy Anti-Tank Assets effective area.
- Modern Machine Gun Mount is extremely efficient against various light targets due to a stabilizer.
- The Fire Control System provides sustained target search, detection, identification and tracking under any weather conditions, day and night, from a halt position or on the move.The T-90MS MBT offers comprehensive protection against conventional ammunition, precision guided weapons (guided artillery projectiles, ATGMs) and anti-tank rockets.

Main characteristics

- Crew 3
- Weight with ammo ..... 48 t +3%
- Engine..... 1,130 hp
- Power to weight ratio..... 23 hp/t
- Top Road Speed ..... 70 km/h
- Cruising range..... 500 km

Klavesin-1RE

Autonomous underwater vehicle

Stealth inspection of bottom surface at deep waters

Scanning system

- Long time of operation in autonomous mode;
- Use of several scanning systems with different physical principles of operation;
- High search efficiency;
- Operation at deep waters;
- Fast change of task;
- Accurate positioning of detected objects.

AUV carries out search of small-size pin-point and cable-type objects, and environment scanning at all operation depths. Hydroacoustic and radio channels are used for operation control of AUV.

Klavesin-1RE AUV is a modern hi-tech marine robotic system that can carry out wide range of search and scanning tasks for the Navy and other authorities.

Main characteristics

- Dimensions (length x diameter), m ..... 5,8 x 0,9
- Depth of operation, m ..... up to 6000
- Range, km 280
- Scanning equipment ..... TV, HF/LF side sonars, electromagnetic scanner, profiler

Orlan-30

Complex with UAVs

High precision reconnaissance and targetting

It is equipped with electrooptical payload with laser rangefinder-designator that provides laser illumination of stationary and moving targets for application of high-precision weapons.

The Orlan-30 UAV system is intended for aerial reconnaissance and monitoring of ground and water objects round-the-clock under all weather conditions and implementation of target designation for high-precision weapons.

Main characteristics

- Max. takeoff weight, kg ..... no more than 40
- Flight speed range, km/h 90-150
- Max. flight endurance, h 8
- Operational radius (automatic/semi-automatic mode), km ..... up to 120

Ka-52E

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.

Ka-52E 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-52E has a high combat survivability and combat power, it can be operated round-the-clock, it has a wide range of aerial weapons that can be mounted on 6 hardpoints and it is the only helicopter in the world that is equipped with the Ejection & Shock absorbing System.

Moreover, there is a ship-based version of the helicopter with 4 hardpoints, blade-folding and a wing-console section pivoting mechanisms for basing on decks or in hangars of ships.

Main characteristics

- Normal takeoff weight, kg 12,200
- Max speed, km/h 300
- Maximum climb-rate, m/s 16
- Service ceiling, m 5,500
- Hovering ceiling, m 4,000
- Range (with internal fuel tanks), km 460
- Maximum payload, kg 2,942

VECTOR UNVEILS UNIQUE C-UAV SYSTEM TO COUNTER FPV DRONES

Vector Research Institute (a subsidiary of Rostec's Ruselectronics holding) for the first time demonstrates abroad the latest Russian automated system for electronic suppression of the small-size unmanned aerial vehicles (UAVs). The device is an essential component of the SERP-VS6 C-UAV system and the radio monitoring equipment (RME). The full-size products are showcased at the exposition of the Rosoboronexport company (a Rostec's subsidiary) at the World Defense Show 2024 International Defense and Security Exhibition in Saudi Arabia.

The Vector institute offers various solutions in monitoring, detection, identification, tracking and elimination of various UAVs. The SERP-VS6 is the latest modification of the electronic suppression system of the UAVs of the SERP ('Sickle' in Russian) family. The tests were successfully completed in 2023, and the deliveries of the system to Russian civilian operators are already underway.

The unique feature of the system is its capability to fully operate in passive mode, with no radiation emission. It can also suppress first person view (FPV) UAVs by expanding operating frequency range from 430 MHz to 5.8 GHz.

Another unique feature of the new system is human-out-of-the-loop functioning mode. It is capable of simultaneously jamming several channels within a radius of up to 5 km and protecting objects from multidirectional attacks by drone swarms. The suppression range can be selected automatically for the target designation from the radio reconnaissance (RRE) equipment.

The SERP-VS6 has a sectoral suppression function with the independent operating modes depending on instructions received from detection units, which allows the use of other drones and communications equipment, if necessary, when the system operates.

The system suppresses the drone control channels, breaks datalinks, disables navigation equipment, disorients the drone in the space and disrupts the flight mission. The system can jam NAVSTAR (GPS), GLONASS and BeiDou signals, as well as Wi-Fi data transmission channels.

The DU component also functions in passive mode, producing no emission at all. The piece of hardware takes direction finding of UAV control signals from the operator's console and determines its location using the triangulation method.

'C-UAV protection is becoming an integral part of the security system of any critical infrastructure facility. Therefore, the global market for anti-drone hardware is being developed at a steady pace. In 2023, more than 100 units of the SERP-family systems were supplied to the Russian market. The products effectively solve the issues of protecting various territories from UAVs; they are also successfully operated at the facilities of the fuel and energy field and the enterprises of Russia's military industry' Director General of the Vector Institute Sergei Skorykh said.

All the aforementioned C-UA systems are compact – they fit in several portable cases and can be deployed in 30 minutes. The company's specialists also carry out work related to the use of C-UAV systems on wheeled carriers, including protected ones.

The Vector Institute is among Russia's leading enterprises for the development and production of radio and electronical hardware. It was founded in 1908. Since 2009, it has been part of the Vega Radio Engineering Corporation. The institute is involved in the development and production of various drone detection C-UAV systems, as well as and the 'Penicillin' (1B75E) automated sound-thermal artillery reconnaissance system.

/RA&MG/

ALMAZ – ANTEY WILL PRESENT THE LATEST AIR DEFENSE SYSTEMS AT WDS-2024

Almaz - Antey
Corp.

At the World Defense Show 2024, Riyadh, the Kingdom of Saudi Arabia, Almaz – Antey Air and Space Defence Corporation, JSC will demonstrate models of medium-range air defense missile systems S-350E Vityaz and 9K317ME Viking.

The S-350E Vityaz air defense system, max. kill range 120 km, is designed to defend administrative, industrial and military facilities from massive attacks of modern and future air attack weapons. The system is capable of repelling air attacks from any direction simultaneously.

The S-350E system includes a combat control point (CCP), up to two multifunctional radars (MFRs), up to 8 launchers (Ls) or loader-launchers (LLs), accommodates up to 12 anti-aircraft guided missiles. The combat operation of the S-350E system is controlled by a crew of three people.

The main advantage of this system specified by unmanned combat work of MFRs, Ls and LLs. The survivability of the system is ensured by large distance between combat assets, as well as the high ability maneuver, and quick change relocation. The S-350E is capable of operating both autonomously and under the control of higher command posts. Interfacing with other systems is possible.

The all-weather, multi-channel, highly mobile 9K317ME Viking air defense system is a multi- task universal means of protecting troops and important facilities from air raids. It is intended to defend troops and facilities from modern and future tactical and strategic aircraft, including those using Stealth technology, tactical ballistic and cruise missiles, helicopters, reconnaissance and strike systems and UAVs, radio-contrast ground and surface targets. The combat assets of the system include a CCP, a 3-D target detection radar, up to six self-propelled firing units (SPFUs) or illumination and guidance radars (IGRs) in any combination and launcher units (LUs) attached to them.

The Viking can interface with AD automated control systems the customer has. The CCPs can directly interact with some short-range air defense combat vehicles, radars and battery command posts, allowing the organization of layered air defense. The elements of a command post are built into the SPFUs and IGRs, which makes it possible to organize operational mobile air defense groups without a CCP. The system can effectively carry out tasks in conditions of electronic and fire actions. Its combat elements can be manufactured both on tracked and wheeled chassis. The remote workstations are available for combat work of all combat assets of the system.

The short-range air defense systems at the World Defense Show-2024 will be presented by models of 'Tor' family air defense systems (Tor-E2, Tor-M2K, Tor-M2KM) in tracked and stationary versions. The modern 'Tors' are the one air defense system capable of firing on the move, high-mobile, easy-operated and cost-effective, especially for covering strategic facilities and infrastructure, for example, in oil production areas.

At the Corporation's stand you will also be able to see the following models of ultra-short-range air defense systems: the Tunguska-M1 anti-aircraft gun-missile system and the Typhoon-Air Defense (E) MANPAD anti-squad combat vehicle. The latter was created on the basis of the KAMAZ-4386 armored vehicle and is intended for covering units in combat and on the march, from air attack weapons. The Typhoon-AD (E) is equipped with a radio station of the Aqueduct family, the Azimuth navigation equipment, a sighting system for a Kord machine gun. The combat vehicle provides transportation for five people: a squad commander, two MANPAD gunners, a machine gunner, and a driver.

For the first time abroad, the Almaz – Antey will present a modernized version of the 3M47-03E Komar turret, which is effective in counteracting air attack weapons and unmanned sea drones. This became possible due to the fact that in addition to 9M342 Igla-S type, 9M120-1 missiles Ataka were installed in one mount. The whole turret is lightweight and can be installed on ships and boats with a displacement of 50 tons. The Komar is equipped with a gyrostabilization system, which adapts the use of missiles in sea conditions. The target tracking and missile launch can be carried out both automatically and manually.

At the World Defense Show, you will also be able to see models of the mobile 3-D combat solid-state radar of medium and high altitudes Gamma-S1TE, the automated transportable solid-state low-altitude radar Podlet-K1KE and low-altitude 3-D all-round radar standby mode Casta-2E2. These radars are successfully used for detection, coordinate measurement, tracking, identification of airborne objects and advanced air attack weapons, including those using Stealth technology, under the influence of intense active, passive and combined interference, as well as fire counteraction. In addition, the exhibition will feature models of the 103Zh6E mobile multi-band radar system; 59N6-TE mobile 3-D L-band radar; 55ZH6UME mobile 3-D medium and high altitudes standby mode radar; K145E high-precision weapons protection system; 1L122-1E small-sized radar; 1K130E helicopter ground reconnaissance system.

The Almaz – Antey eposition will also feature a dynamic model of Sula specialized radar for observing space objects. This radar provides tracking of satellites, space debris and other space objects in orbit at a distance of up to 6 thousand km. Sula provides the receipt of coordinate and non-coordinate information about space objects, which is recorded on non-volatile media and transmitted to the consumer in real time. The station's antenna is built on the basis of a modular digital active phased array antenna, which provides the radar high information characteristics, throughput and noise immunity. The peculiarity of Sula lies in the compact dimensions of the antenna surface and the sectional-modular principle of architecture, which allows the radar to be deployed on the ground in a short time and moved by rail. The station is controlled from a command and computing center located in a prefabricated module.

Vyacheslav Dzirkaln, Deputy General Director for foreign economic activity of Almaz – Antey Corporation said on the eve of the event, that 'our products traditionally arouse great interest at such exhibitions sites, since over the years and practice they have proven their high efficiency, reliability and unpretentiousness.' He added that 'representatives of the Corporation during the World Defense Show will talk about the Corporation's exclusive capabilities in the development and production of modern Russian air defense equipment, servicing of supplied products, extending their service life, modernization and disposal.' According to him, the video data and media presentations on the technical capabilities of manufactured products will be demonstrated at the Corporation's stand, and the Corporation's specialists will hold a number of business meetings and negotiations. Vyacheslav Dzirkaln expressed confidence that the recent visit of the President of Russia Vladimir Putin to Saudi Arabia will give a new boost to the development of bilateral relations in the military-technical sphere, including air defense. /RA&MG/

Almaz – Antey Air and Space Defence Corporation, JSC is one of the largest integrated associations of the Russian military-industrial complex, which includes over 60 high-tech enterprises. The total number of employees of the Corporation is about 140 thousand people. The Corporation's products are supplied to more than 50 states around the world. Almaz – Antey has the right to carry out independent foreign trade activities in relation to military products, including the supply of spare parts, repairs and modernization of previously supplied equipment. The Corporation pays special attention to the training of customer specialists, issues of operation and maintenance of supplied equipment, and offers after-sales service, repair, modernization and disposal.

THE AUTONOMOUS COMBAT MODULE TOR-M2KM IS THE BEST CHOICE FOR AIR DEFENCE OF STRATEGIC FACILITIES AND INFRASTRUCTURES

Almost from the very beginning of military aviation, it was used for strikes against large cities and other strategic facilities. Already at the beginning of World War I, German Zeppelins bombed London and British Avros bombed Friedrichsgafen. In World War II, strategic bombing reached a colossal scale – a number of raids simultaneously involved more than a thousand aircraft. Along with the development of means of attack, defence measures were also strengthened. It was during World War II that the idea of creating special blockhouses to house anti-aircraft artillery – the German 'flaktrum' – was born and realised.

Problems of air defence of strategic facilities and infrastructures and ways to solve them

When creating air defence of large cities, German specialists faced a number of problems. Location of anti-aircraft guns along the perimeter of the city required a large number of guns. At the same time, only a part of them – those that were on the direction of the strike – participated in the battle. But even they could not work on the bombers that broke through the air defence line – the city centre remained unprotected. When the air defence was placed directly in the city quarters, the guns were hampered by houses and even trees and, as a consequence, they could fire only narrow sectors, which again – either left part of the object unprotected, or required a multiple increase in the number of barrels, most of which again remained inactive. The 'Dusky Teutonic genius' found a solution to this problem in the creation of special anti-aircraft towers, on which the guns were raised almost in line with the roofs of city houses and had the possibility of circular firing.

This decision was forgotten for many years after World War II due to the changed tactics of air attack on strategic targets. After the creation of the nuclear bomb, it became the main threat. And its carrier was the high-flying strategic bomber. The fight against which was technically more difficult, and organisationally – easier. For example, to provide air defence for such a large industrial centre as Izhevsk, it was not without reason that one or two positions of ADM system-75 placed a kilometer away from the outskirts of the city were considered sufficient – the missile approached the high-altitude target at a high angle, gained altitude over a clear field, quickly leaving the urban area far below, and the range was sufficient to intercept the target on the approaches to the opposite outskirts.

Today, however, the situation has changed again. In practice, the main threat is posed by low-flying air assault weapons– cruise missiles and UAVs. Detection and interception of such targets can be seriously hampered by houses and trees, which makes one think of the idea of raising air defence systems above urban areas. Moreover, it is not at all necessary to build special warehouses – Russian designers have created an ADM system that can be placed on the roofs of standard houses.

On the roof of one's house

The Izhevsk Electromechanical Plant Kupol has proactively developed an autonomous combat module of the ADM system Tor-M2KM. Abandoning the chassis allowed to significantly reduce both the cost and weight of the product. The weight of the module is more than half of the basic caterpillar version and is only 15 tons. According to one of the mandatory regulations, the same weight of snow a flat roof of a 100 m^2 house should be able to withstand in areas with average snow load. That is, Tor-M2KM can be placed on the flat roof of any house built in accordance with the rules and regulations (perhaps – the simplest system of weight distribution is required, and of course – regular snow removal is necessary). The Tor-M2KM can be lifted to the roof by a Mi-26 helicopter or a loading crane of appropriate lifting capacity. Wired communication between the combat modules and with the battery command post (it is located on the ground) can be provided by means of conventional masts and towers, including those built on the roofs of neighboring houses. Thus, there are no serious difficulties in implementing the old idea of flaktrums on a new technical level.

Taking into account the damage radius of the Tor-M2KM autonomous combat module (up to 15 km), the heading parameter (±8 km), and the ground track parameter between the modules and the Battalion command post (5 km), it is easy to calculate that an object/city with a radius of 10 km can be reliably covered by just one battery of ADM system Tor-M2KM. At the same time, the damage radii of individual modules will partially overlap each other (including in 'dead' sectors), and within 3-5 km from the object, all the battery's combat modules will be able to work on targets simultaneously.

There may be concerns that it would be difficult for ADM system to intercept a target below, but there is no reason for such concerns. Taking into account the curvature of the Earth's surface and the fact that

The Izhevsk Electromechanical Plant Kupol (part of Almaz – Antey Air and Space Defence Corporation, JSC) is one of the leading enterprises of the Russian military-industrial complex, the leading designer and manufacturer of the Tor system of air defence missile systems. The plant also manufactures airborne equipment for surface-to-air missiles, provides maintenance services to operating organizations, and repairs and upgrades previously delivered ADM system.
ADM system produced by the Izhevsk Electromechanical Plant Kupol is in service with the Russian Army and coastal units of the Navy, as well as with the armies of two dozen countries on three continents The Izhevsk Electromechanical Plant Kupol continuously searches for ways to further improve the effectiveness of its air defence systems, which allows them to successfully counter modern and advanced air attack weapons.

ADM system of Tor family are capable of firing at targets in the lower semi-sphere (up to -5°), the possibility of firing at low-flying air assault weapons is fully preserved or even increased. For example, when the combat module is raised to a height of 100 m, the short-range interception limit for targets flying at a height of 10 m is about 1 km – i.e. the usual 'dead' zone does not grow.

Placement on rooftops does not hinder, but on the contrary, increases the effectiveness of ADM system. It increases the range of detection, reduces the influence of terrain and urban buildings, and, ultimately, moves the encounter point of the missile with the target to the far edge of the damage zone to the maximum extent possible. The latter is an important factor, given that even the debris of an intercepted aerial assault weapon can cause casualties and destruction.

Such characteristics of the ADM system Tor-M2KM autonomous combat module as low deployment time (3 minutes – a world record), which makes it possible to repel a surprise air raid, high speed of airspace surveillance (1 antenna rotation per second – the world's best record), which makes it possible to react quickly to the changing situation, low reaction time from target detection to SAM launch – 5-10 seconds, which is especially important when working against low-flying targets, which are detected later than low-flying air assault weapons, are also fully compliant with the tasks of providing air defence of strategic facilities and infrastructures.

The ADM system Tor-M2KM is capable of intercepting any aerodynamic targets flying at speed up to Mach 2 and above, with an effective dispersion surface of 0.1 m^2 or less.

The Tor-M2KM autonomous combat module is based on the ADM system Tor-M2U. In case the combat modules will be built on the basis of the newest version of Tor – ADM system Tor-M2 combat capabilities are significantly increased: the damage zone is extended to 1-16 km in range, 0.01-12 km in altitude and ±9.5 km in ground track parameter, the ammunition load is increased from 8 to 16 SAMs, etc.

Where there is a threat of high-flying bombers or ballistic missile attacks, the Tor-M2KM autonomous combat module can be coupled (including directly) with the ADM system Viking (a modular version of the ADM system Buk family) or with the ADM system S-300V4. In this case, the advantages of each of the combat vehicles, mutually complementing each other, will provide a reliable shield against any air assault weapons.

The Universal Soldier

Due to its peculiarities, the ADM system Tor-M2KM has a significantly expanded area of application. It can be installed on a railway platform or a ship deck, which will provide reliable air defence cover for the transport of valuable cargos. The ability of the new and latest ADM system of Tor family to operate at sea and from the shoreline against targets flying over the sea has been proven in practice. This has been achieved thanks to the introduction of new algorithms for the combat operation of the computer system, which allow levelling the impact of wave rolling.

The module can be moved from one position to another with relative ease. Transportation is carried out on any chassis (self-propelled or trailed) with a suitable load capacity (from 20 tons). Installation on the chassis and removal – by a 25-ton crane. Repositioning time – 10 minutes (at the same time, according to the total time spent on repositioning and deployment – 10+3 minutes, the system can be considered mobile by Western standards – modern Western ADM systems are deployed/redeployed in 10-15 minutes).

If necessary, the autonomous module can easily return to the air defence forces – the system can be easily integrated with any chassis of suitable payload capacity.

This breadth of applications makes the Tor-M2KM autonomous combat module a truly 'universal soldier' and provides wide maneuver of available air defence forces in accordance with emerging/disappearing threats. /RA&MG/

UNIVERSAL BRAHMOS:
THE ULTIMATE FORCE MULTIPLIER

World's most powerful and deadliest supersonic cruise missile system BRAHMOS, jointly designed and developed by India's DRDO and Russia's NPOM, has strongly positioned itself as a formidable deterrent weapon during high intensity military conflicts of modern times. The 'universal' missile combining high speed, pin-point accuracy, deadly firepower and manoeuvrability has been successfully operationalised in the Indian Army, Indian Navy and Indian Air Force.

Designed as a state-of-the-art tactical weapon having impeccable anti-ship and land attack capability, BRAHMOS has swiftly evolved since its maiden successful launch conducted on June 12, 2001. The missile has since then been successfully developed and deployed in land-to-land, land-to-sea, sea-to-land, sea-to-sea, air-to-land and air-to-sea variants.

As an incredibly versatile system, BRAHMOS has validated its capability to undertake 'across-the-spectrum' combat operations in a network-centric environment. The supersonic cruise missile has been successfully tested from ground, ship and air platforms for a record number of times till date. The missile's 'salvo' launch capability to be fired in quick succession in same or different directions to engage one or more enemy positions simultaneously makes its even deadlier.

The weapon has also been tested from an underwater platform, thus proving its flexibility to be deployed on conventional attack submarines.

BrahMos Aerospace, the India-Russia JV entity, has been designing, developing, producing and marketing the world-class BRAHMOS Weapon Systems. The JV has designed and developed BRAHMOS land-based weapon complex, ship- and shore-based weapon complex, and the advanced air-launched cruise missile variants.

Indian Navy became the first force to deploy BRAHMOS in 2005. The missile, having world-class anti-ship capability, has been integrated into the combat suites of several frontline surface warships of Indian Navy as the 'prime strike weapon'. In its naval configuration, BRAHMOS can be fired from either vertical or inclined launchers from static or moving naval platforms in single or salvo mode, thus giving the Navy an unparalleled flexibility and outreach to engage and neutralize both sea and land-based targets from long, stand-off ranges in any weather conditions.

The land-attack BRAHMOS variant has been deployed by Indian Army since 2007 to carry out land warfare operations in divergent conflict scenarios from varied and difficult land terrains. The BRAHMOS land-attack cruise missile (LACM) has been developed in advanced Block I, II and III configurations, each having distinct capability to neutralise high value ground targets. The Indian Air Force (IAF) has also deployed BRAHMOS LACM squadron.

On January 20, 2020, the IAF raised the formidable 'Tigersharks' squadron consisting the Sukhoi-30MKI air combat platform armed with the highly advanced BRAHMOS air-launched cruise missile (ALCM) system. Prior to its induction, BRAHMOS ALCM underwent a series of successful test firings from the IAF's Su-30MKI fighter between November 2017 and December 2019.

Today, BRAHMOS ALCM has established its supremacy as the world's most powerful conventional air-borne weapon capable of obliterating ground and sea-based strategic targets from large, stand-off, beyond visual ranges in day & night and all-weather conditions.

In a major breakthrough, BrahMos Aerospace on January 28, 2022, signed a landmark export contract with the Republic of Philippines to deliver BRAHMOS Shore-base Anti-ship Missile System (SBASMS) to the Armed Forces of Philippines (AFP).

The historic export order positioned BRAHMOS as India's first, full-scale modern weapon set for delivery to a foreign customer nation, thus effectively accomplishing the pioneering 'Mind-to-Market' strategy of BrahMos Aerospace. The JV entity is now eying to further expand its global footprint with more export orders from a number of countries who have evinced strong interest in acquiring the tactical missile for their Armed Forces.

'A world-class weapon based on cutting-edge technologies, BRAHMOS offers range, precision, firepower, versatility and stealth. The tactical missile has emerged as a very powerful and cost-effective deterrent system which can be deployed as a 'net security provider' during times of conflict and conflagration,' says Atul Dinkar Rane, DG (BrahMos, DRDO) and CEO & MD of BrahMos Aerospace.

Meanwhile, to retain the leadership position of formidable BRAHMOS in worldwide cruise missiles market, the India-Russia JV entity has set its sight on designing and developing a more advanced, futuristic variant of the existing weapon. To be called BRAHMOS-NG (next-generation), the new missile with its smaller, lighter and smarter dimensions, promises to revolutionise the battlefields of tomorrow. /RA&MG/

BEST TECHNOLOGIES

HEAVY TRANSPORT AIRCRAFT IL-76MD-90A

The IL-76MD-90A heavy transport aircraft developed by Ilyushin Design Bureau, part of the United Aircraft Corporation, is a deep modernization of the well-proven IL-76MD aircraft. Despite the external similarity with its predecessors, the new modernized version of the IL-76MD-90A aircraft is fundamentally different from them.

More than 70% of aircraft systems and assemblies have been updated on the aircraft, which made it possible to increase the payload from 40 to 60 tons, increase the flight range and improve flight safety. Thus, the IL-76MD-90A makes it possible to solve assigned tasks at a qualitatively new technical level.

The aircraft implements the 'glass' cockpit principle, which reduces crew load. Information is displayed on the digital cockpit on 9 multifunctional screens, which replaced the analogue instruments installed on the previous generation of transport aircraft.

The new communications complex provides high quality communications and data exchange, including through satellite systems, and the latest defense complex provides protection against various enemy weapons.

The IL-76MD-90A is equipped with new, more powerful PS-90A-76 engines, which provide improved takeoff, landing and cruise performance, increased payload and flight range, increased efficiency and high environmental requirements for noise and emissions of harmful substances.

The aircraft also features a new strengthened wing with reduced weight and increased service life. The new design allowed to simplify the manufacturing technology. On the previous modification of the Il-76, the wing panels were made of two parts. In the new version of the aircraft, the wing panels are made in one piece, 25 meters in length.

The IL-76MD-90A also has a modernized landing gear, which is now designed for a take-off weight of 210 tons (including 60 tons of load). Thanks to this, the aircraft can operate from equipped and unequipped airfields, on concrete and dirt runways. New KT-199M wheels with increased energy intensity are used, which allows the aircraft to operate in the most severe climatic conditions at extremely low and high temperature conditions. The new upgraded landing gear system has also improved its characteristics, including indication and control on the ground and in flight.

The IL-76MD-90A has a unique set of airborne transport equipment, which has been improved through the automation of loading systems and the use of an auxiliary power unit TA-12A of increased power with an increased period of continuous operation and automatic control. The new set of transport equipment does not require any auxiliary mechanisms or people for loading and unloading cargo. All functions can be provided by a crew of 6 people.

The IL-76MD-90A is also equipped with a new wireless mobile control panel for cargo loading and securing system. Now the operator is not constrained in his movements, he can come close to the cargo or carry out loading and unloading operations outside the cargo compartment.

As a result of the modernization, a video recording system was installed, which allows increasing the situational awareness of the crew during the flight or on the ground. Several surveillance cameras record everything that happens in the cockpit, in the cargo compartment, and on the ramp.

If necessary, the IL-76MD-90A can be equipped with fire extinguishing equipment, as well as medical modules for evacuating people in emergency situations with the ability to provide qualified medical care. Re-equipment does not require a large amount of work and can be carried out at the airfield.

Currently, United Aircraft Corporation in cooperation with Russian component suppliers, is conducting serial production of these aircraft and is implementing a program to increase its pace.

A unique feature of the IL-76MD-90A is its versatility. The use of new design methods and production technology provides the opportunity for further effective modernization of the aircraft and the creation on its basis of a whole family of special-purpose aircraft that meet all existing international requirements and meet the special requirements of customers.

The aircraft as a universal transport platform ensures the creation of aircraft for various applications – tanker, hospital, flying laboratory, search and rescue, firefighting, AWACS, Airborne Control Post (ACC), etc.

Today, IL-76 aircraft are in demand more than ever and are successfully used for a variety of tasks, including special operations and paratroopers. They are capable of transporting armed forces personnel anywhere in the world, transporting cargo for various purposes both within the country and around the world, and extinguishing natural and man-made fires. **/RA&MG/**

DUBAI AIRSHOW 2023

18th edition of Dubai Airshow was held on 13-17 November 2023 at Dubai World Central (DWC), Dubai Airshow Site. It is one of the largest and most successful airshows in the world, connecting aerospace professionals across all areas of the industry to facilitate successful global trade. The event was held with the support of Dubai Airports, the Dubai Civil Aviation Authority, the UAE Ministry of Defence and Dubai Aviation Engineering Projects, and organised by Tarsus Middle East. The exhibition subject was arms and military equipment of the Air Force, Air Defence, space equipment, civil aviation and technologies in aircraft building. The organizer of the Russian exposition of the military-purpose products was JSC ROSOBORONEXPORT (part of Rostec State Corporation). At the exhibition the united Russian exposition were represented by State Corporation Rostec, Rosoboronexport, Roscosmos, NASC, UAC, Russian Helicopters, UEC, 'Almaz – Antey' Air and Space Defence Corporation, KRET. 'Russian Knights' aerobatics air group of the Aerospace Forces of the Russian Federation, as well as Ka-52 combat reconnaissance attack helicopter also took part in the demonstration flights program.

18th edition of Dubai Airshow became the largest ever edition of Dubai Airshow, with a royal tour led by His Highness Sheikh Ahmed Bin Saeed Al Maktoum, President, Dubai Civil Aviation Authority; Chairman, Dubai Airports; Chairman and Chief Executive, Emirates Airline And Group, taking government leaders and senior industry stakeholders through the static aircraft display and main exhibition. The industry mega-event gathered key players from across aerospace, space and defence for the 18th edition – more than 1,400 exhibitors from over 95 countries and more than 190 aircraft on static display.

During exhibition a significant amount of orders and deals were announced, including a multi-billion dollars commercial order from Emirates, backed by air travel demand returning strongly to reach pre-pandemic levels. With an increased focus on Space at this edition of Dubai Airshow, the UAE Space Agency led the largest space pavilion in the exhibition's history to date, reflecting its commitment to enhancing and consolidating the UAE's position in this vital sector. Here, Sultan Al Neyadi and Hazza Al Mansouri, the first two astronauts from the United Arab Emirates were presented at the Mohammed Bin Rashid Space Centre stand, showcasing the pioneering UAE space missions.

Timothy Hawes, Managing Director of Tarsus Middle East, said: 'Dubai Airshow 2023 was a true testament to the continued growth we have seen across the industry and served as the perfect platform to showcase the next-generation features and innovative technologies that will ensure an efficient and sustainable future. Industry players from across the world continued to gather in Dubai and collaborated to define the future for aerospace.'

JSC ROSOBORONEXPORT (part of Rostec State Corporation) was organizing an exhibit of the latest Russian-made Air Force, Air Defence and electronic warfare equipment at the Dubai Airshow 2023 International Aerospace Exhibition. As part of the exhibit, located in a single Russian pavilion with a total area of over 750 square meters, Russia's 13 largest defence manufacturers showcased 250+ models of modern weapons and military equipment.

'The Dubai Airshow has steadily ranked among the top five largest and most important international aerospace exhibitions. For JSC ROSOBORONEXPORT, it is one of the main foreign platforms to promote Russian aircraft and air defence equipment, primarily in the Middle East and North Africa, whose share in the company's order book reaches 50%. Here we have to compete with the global leading arms manufacturers,' – said Alexander Mikheev, Director General of JSC ROSOBORONEXPORT before exhibition. 'Dubai Airshow is a venue to unveil new products. In 2023, for the first time we will present here the IL-76MD-90A(E) military transport aircraft, the latest air weapons for the fifth-generation fighters, including the RVV-MD2 and RVV-BD air-to-air guided missiles, the Kh-69 cruise missile, as well as the world's best Ka-52 attack helicopter with a line of air weapons, which has proven effective in countering modern armored vehicles in real combat conditions.'

The IL-76MD-90A(E) military transport aircraft, which was located in an outdoor static display area, is multifunctional and has been successfully used for a wide range of missions, including for special and airdrop operations. It can carry up to 60 tons of cargo to a distance of up to 4,000 km, and 20 tons – to 8,500 km. The aircraft is equipped with a multi-channel electro-optical sighting system to determine an airdrop area, and control personnel, and cargo airdrops, as well as the President-S defensive aids system. Along with the IL-76MD-90A(E), JSC ROSOBORONEXPORT showcased various airdrop systems, including the Junker-DG-250 automated cargo delivery system for the first time in the Middle East.

During demo flights, the Ka-52 scout/attack helicopter, recognized by international experts as the best helicopter in its market segment,

Vyacheslav Dzirkaln,
head of the delegation of Almaz – Antey Air and Space Defence Corporation, JSC at the Dubai Airshow 2023:

'In the joint exposition at DubaiAirshow-2023, Almaz – Antey Air and Space Defence Corporation, JSC presented a wide range of its air defense systems and other products. In particular, we presented models of the S-350E 'Vityaz' medium-range air defense system, the 'Viking' medium-range air defense system, the 'Tor-E2', 'Tor-M2K', 'Tor-M2KM' short-range air defense systems, and the combat vehicle of anti-aircraft gunners 'Typhoon-Air Defense (E)'. In the airspace control zone, the visitors to the exhibition could see the models of the 'Kasta-2E2', 'Podlet-K1KE' and 'Gamma-S1TE' radar stations. Also at the Corporation's stand the aerial missile-type target from the 'Adjutant' universal target training system was presented.

In addition, we told potential partners about the capabilities of Almaz – Antey Air and Space Defence Corporation as one of the world's leading developers and creators of air defense systems. The particular interest on the part of delegations from many states that visited our stand was shown in the issues of service maintenance, extension of service life and modernization of products manufactured by enterprises of our Corporation.

I would like to note that since all states are faced with the task of increasing reliability in ensuring airspace safety, attention to the products we create is objectively growing. This is particularly because our systems are mobile, reliable and highly efficient. In addition, we offer a very wide range: we have models of different ranges, with the ability to be installed on various platforms, etc. In other words, we can create the most effective protection to deal with almost any challenge.'

Alan Lushnikov,
President of Kalashnikov Concern, JSC:
'Due to the dynamically developing military-technical cooperation with the Gulf states in various fields, we consider the Dubai Airshow 2023 primarily as a platform for holding working the meetings and discussing numerous issues and details related to both previously launched and promising projects.
In its exposition at the Dubai Airshow-2023, the corporation presented the samples of products from various areas of activity of the corporation's enterprises: 7.62 mm Chukavina microwave sniper rifle, 5.56 mm Kalashnikov AK-19 assault rifle (short-barreled version), 9 mm Lebedev compact PLC pistol, 9 mm submachine gun Kalashnikov PPK-20, KUB-E guided ammunition system, All weather Set of Field Uniforms and modular unloading systems.'

showed visitors the elements of piloting available only for a coaxial helicopter: flat turn towards the target, lateral movements at high speeds and deep sideslip with a negative pitch angle.

The Russian Aerospace Forces' Russian Knights aerobatics demonstration team, which arrived at the Dubai Airshow at the invitation of the UAE Ministry of Defence, performed aerobatics on Russian Su-30SM and Su-35S fighters during demo flights.

In the unmanned aerial vehicles segment, JSC ROSOBORONEXPORT presented the Orlan-30 unmanned aerial system in the outdoor static display area, and the Orion-E reconnaissance/attack UAV and KUB-E loitering munition in the pavilion.

In the pavilion, visitors of JSC ROSOBORONEXPOR 's stand could see the Su-57E fifth-generation fighter, IL-78MK-90A tanker aircraft, Su-35 multirole super-maneuverable fighter, Mi-28NE attack helicopter and the Mi-171Sh military transport helicopter.

In the air defence segment, ROSOBORONEXPORT was exhibiting a wide range of air defence and electronic warfare systems. They can be used both independently and as part of a layered air defence system. The Russian exhibit included the S-400 Triumf and S-350E Vityaz air defence missile systems, the Viking surface-to-air missile (SAM) system and various versions of the Tor SAM system produced by the Almaz – Antey Air and Space Defence Corporation. A line of air defence equipment from the High Precision Systems holding company, incorporated into Rostec State Corporation, was represented by the Pantsir-S1M self-propelled anti-aircraft gun/missile (SPAAGM) system, Igla-S and Verba man-portable air defence missile systems.

Visitors of the Russian pavilion could get acquainted with Russian counter-UAV assets, including the RB-504P-E, Repellent-Patrol, Argument-2 and Argument-3 systems, as well as the Pole-21E and R-330Zh electronic warfare systems for countering precision guided munitions. A Russian automated system used against small UAVs was also presented to the visitors.

As part of the Dubai Airshow 2023, ROSOBORONEXPORT presented a new export product developed by the company's specialists in cooperation with relevant experts of the Russian Aerospace Forces – an integrated survival and self-defence system for aircrews of aircraft and helicopters who have ejected or found themselves on the ground after an emergency landing. A key element of the new system is a 5.56mm Kalashnikov AK-19 shortened assault rifle, presented abroad for the first time.

'The survival of helicopter and fixed-wing aircrews in emergencies before the arrival of search-and-rescue units largely depends on the level of equipping them with the necessary life-support and self-defense items. Rosoboronexport has studied the real experience of recent military conflicts and chosen the most optimal set of equipment and gear enabling the crews to survive and maintain combat capability in the most extreme conditions. At Dubai Airshow 2023, we are unveiling this unique product consisting of entirely Russian-made components that have been tested in combat conditions,' said Alexander Mikheev.

The aircrew survival and self-defense system, offered by Rosoboronexport for foreign markets, is thematically divided into 4 clusters: functional personal items, individual protection and survival equipment, communications and surveillance equipment, as well as self-defense weapons.

The first cluster includes combat trousers, shirt and shoes. The proposed configurations for all climatic and weather conditions are designed for a temperature range from +50 to -50 °C. In addition, the personal items cluster also includes a tactical pouch for a survival kit and a webgear with ammunition, life support, first aid kit pouches and a holster for a Lebedev compact pistol.

Individual protection and survival equipment includes a plate carrier and two types of armor plates for it, ceramic and UHMWPE, as well as a ZSh-7 upgraded protective helmet. A survival kit, tailored taking into account the experience of pilots' survival in real combat conditions, is offered in the same cluster. It contains a first aid kit, dry ration, a hook with a fishing line, a knife and other equipment.

For communications and surveillance purposes, the system includes an R-187 Azart software-defined radio with a headset, PN-21K night vision monocular, GEO-ONV1-01M night vision goggles for piloting helicopters.

In the self-defense equipment cluster, Rosoboronexport, on advice from Russian Aerospace Forces specialists, proposes to equip the aircrews with a 5.56mm Kalashnikov AK-19 shortened assault rifle, presented abroad for the first time, or a 9mm Kalashnikov PPK-20 submachine gun with a PKU-2 collimator sight, as well as a 9mm Lebedev PLK compact pistol.

In addition to arranging the exhibit in the pavilion and the outdoor static display area, ROSOBORONEXPORT showed reviews of the main Russian exhibit items, a preview of the air show and its most interesting moments on its digital platforms – on the company's official website, it's Youtube, VK and Telegram channels.

'In addition to showcasing new Russian weapons at Dubai Airshow 2023, JSC ROSOBORONEXPORT will hold a rich business program. We are planning to meet with our partners from the Gulf countries and discuss military-technical cooperation between our countries. We will focus on technology partnership projects, which is the most popular format of cooperation in the Middle East today,' – Alexander Mikheev added. 'In addition, during the airshow we will continue to develop contacts with African countries on the points of interaction found jointly during this year's Russia-Africa Summit in St. Petersburg'.

JSC ROSOBORONEXPORT also presented in Dubai a new product – Russian automated system for countermeasures against small-sized remotely piloted vehicles (RPV).

'Latest military conflicts showed a tremendous role of the remotely piloted vehicles of all classes in reconnaissance, surveillance of the situation and destruction of manpower, materiel, installations. On the tactical level, small-sized vehicles are mainly used on a massive scale. These are cheap, but capable of inflicting serious damage,' – said Alexander Mikheev before Airshow. 'JSC ROSOBORONEXPORT will unveil in Dubai an advanced system with a high degree of automation; a product able to detect, neutralize or destroy popular modern small-sized FPV-drones, quadcopters, unmanned aerial vehicles of the aircraft type. Its characteristics and high effectiveness were confirmed under the battlefield conditions.'

The new export product is designed for outfitting specialized units in order to counter RPVs. The eyes of the system are a portable small-sized radar 1L122-1E made by KRET (Concern Radio-Electronic Technologies, part of Rostec State Corporation), which makes it pos-

sible to detect a RPV at a range sufficient for its interception or destruction.

The radar transmits air situation data via a radio channel to the portable automated control module from the set of the automated control technical aids. It was developed by the Ruselectronics holding company incorporated into Rostec State Corporation. The automated control module may be located at a range up to 5 km from the radar. It is actually a small tablet the commander of the anti-drone unit is equipped with. Data on the RPVs designated for destruction or electronic effect (target designation) is transmitted to the anti-aircraft gunners of the 'Verba' man-portable air defence system made by the High Precision Systems holding company included into Rostec State Corporation or to the operators of the anti-drone rifles fitted with an individual automation package.

The operator's individual automation package includes special goggles with visualization capability, a headset and communications means. This set provides automation of guidance at an air target. It is used for visualization and transmission of the voice commands to the anti-aircraft gunner, electromagnetic rifle operator, sniper or to a shooter armed with other weapons (if needed). An electronic effect on the RPV's communication and navigation channels or its physical destruction constitute the final stage of the process.

At the Dubai Airshow 2023, JSC ROSOBORONEXPORT also presented the 'Argument-2' anti-drone rifle as an electronic warfare (EW) asset. At the Customer's request, it can be replaced with any other portable anti-drone system.

Almaz – Antey Air and Space Defence Corporation, JSC presented at Dubai Airshow 2023 models of S-350E Vityaz medium-range air defence missile system, Viking medium-range and Tor-E2, Tor-M2K, Tor-M2KM short-range air defence missile systems, as well as the Typhoon-PVO(E) anti-aircraft manpad gunner's combat vehicle. In the airspace control area Almaz – Antey showed models of Kasta-2E2, Podlet-K1KE and Gamma-S1TE radar stations. In addition, the Corporation's stand demonstrated an airborne missile-type target (MB-R) from the Adjutant universal target-and-training system.

The ADM system S-350E Vityaz has a destruction range of up to 120 kilometers and is designed for the defence of administrative, industrial and military facilities against massive strikes by modern and advanced air assault weapons. The system is capable of repelling air attacks simultaneously from any direction. The ADM system S-350E includes a Command and Control Center, up to two Multifunctional Radars, up to 8 launch or Launch-Loading Vehicles,

each of which carries up to 12 anti-aircraft guided missiles. The ADM system S-350E is operated by a three-man crew. The advantage of this system over other air defence systems is the absence of a crew during combat operation in the Multifunctional Radar, Command and Control Center and Launch-Loading vehicles. The increased survivability of the system is ensured by the spread of combat assets over a sufficiently large distance, as well as the ability to maneuver and change position in a short time. S-350E has the ability to operate both autonomously and under the control of higher command centres. Interaction with information and combat assets of other systems is possible.

The all-weather, multi-channel, highly mobile Viking ADM system is designed for the defence of troops and facilities. It is capable of destroying modern and advanced tactical and strategic aircraft, including those using Stealth technology, tactical ballistic and cruise missiles, helicopters, reconnaissance and strike systems and UAVs, radio-contrast ground and surface targets. The system's combat assets include a Command and Control Center, a Three-Coordinate Target Detection Station, up to six Self-Propelled Guns or Illumination and Guidance Radars in any combination, attached launchers and anti-aircraft guided missiles. Viking can be coupled with the automated air defence control systems possessed by the customer. At the same time, the Command and Control Centers can provide direct interaction with short-range SAM combat vehicles, radars and battery command posts, allowing to organize an echeloned air defence. Command post elements are built into the Self-Propelled Gun and Illumination and Guidance Radar, which makes it possible to organize operational mobile air defence groups without a Command and Control Center. The system can effectively perform tasks in conditions of electronic and fire countermeasures, and its combat vehicles can be manufactured on both caterpillar and wheeled chassis of high cross-country capability. All of the system's combat vehicles can be remotely controlled from remote workstations.

The Typhoon-PVO(E) anti-aircraft manpad gunner's combat vehicle based on the KAMAZ-4386 armoured vehicle is designed to provide direct cover for units in all types of combat, including on the march, against air assault weapons. Typhoon-PVO(E) is equipped with the Akveduk family radio station, Azimut navigation equipment, and a station with a sighting system for the Kord type machine gun. The combat vehicle provides transport for five men: a squad leader, two anti-aircraft gunners, a machine gunner, and a driver-electrician.

The radars presented by the Corporation at the exhibition are successfully used for detection, coordinates measurement, tracking, identification of air objects and promising means of air attack, including those based on Stealth technology, under the influence of intensive active, passive and combined interference, as well as fire suppression.

The Adjutant universal target and training complex is designed to train anti-aircraft systems by creating a complex airborne target environment and is distinguished by the possibility of multiple use of targets simulating the main modern means of air attack.

Praveen Pathak,
director for Advertising, Marketing and Export of the Information Technology Department of the 'BrahMos Aerospace' Russian-Indian company:

'The Dubai Airshow exhibition is an important platform for us, since the representatives of a very wide range of states come over to Dubai for this exhibition – not only from the Central Asia, but also from other regions. And since we are quite actively promoting our products on the foreign market, it is important for us to maintain a dialogue with all potential partners.

Of course, the Gulf states, as well as the UAE itself, are a very interesting region for us, including from the point of view of supplies of BRAHMOS missiles. It is no secret that there is great interest in our missiles in this region.

At Dubai Airshow 2023, we presented both already well-known models and new developments under the BRAHMOS brand – unique missiles with improved characteristics and increased tactical and technical data. In its class, BRAHMOS is by far the best product in the world, and we are constantly engaged in all kinds of improvements and improvements. And this is a serious guarantee that our products will continue to develop at a faster pace.'

GLOBAL MARKET

Vyacheslav Kartashov,
assistant to the Director General of the Izhevsk Electromechanical Plant Kupol, JSC:
'We presented with great success at the Dubai Airshow-2023 a wide range of products from the Izhevsk Electromechanical Plant Kupol, including the 'Tor-E2' combat vehicle, the Tor-M2KM' autonomous combat module of the air defense system on a vehicle chassis, the combat vehicle of the anti-aircraft gunner squad 'Typhoon-Air Defence (E)', the target training system 'Adjutant' designed for training crews of almost any air defense systems, and other products.
Since the Dubai Airshow is, first and foremost, an air show, attention at this salon is focused both on the aircraft itself and on the equipment that provides reliable protection against air attacks. Interest in air defense systems in Arab states is traditionally very high, which is why at the last salon we had a lot of visits from flight officers, senior managers of air defense systems, etc.
Such exhibitions are also of great importance because they provide an opportunity to get acquainted with samples of new air attack weapons, which our primary task is to be guaranteed to counter. New means of attack are being created, we are studying them and, naturally, improving our systems so that they can successfully fight them.
The Dubai Airshow in this context is one of the most intense exhibition venues in the world. This exhibition also confirmed that in many respects the products of the Izhevsk Electromechanical Plant Kupol (a part of the Almaz – Antey Air and Space Defence Corporation, JSC) continue to maintain their leading positions in the world. And our developments often simply have no analogues.'

Vyacheslav Dzirkaln, Deputy CEO of Almaz – Antey Corp. for Foreign Economic Activities, said on the eve of the event, 'our participation in the Dubai Airshow provides an opportunity to familiarize numerous foreign guests of the exhibition with modern Russian air defence equipment and other exclusive defence products of the Corporation.' He emphasised that 'our products today successfully protect the sovereignty and security of many purchasing countries.' 'During the Dubai Airshow-2023, the Corporation's representatives will inform potential partners about the Corporation's capabilities in the field of development, manufacturing and service maintenance of manufactured products, as well as extension of their service life, modernization and utilisation,' Vyacheslav Dzirkaln said. According to him, video materials and media presentations on technical capabilities of manufactured products were demonstrated at the Corporation's stand, specialists of the Corporation held a number of business meetings and negotiations. 'The Corporation's stable functioning is based on the powerful scientific, technical and production potential of its member enterprises,' concluded Vyacheslav Dzirkaln.

The Izhevsk Electromechanical Plant Kupol (part of the Almaz – Antey Air and Space Defence Corporation) presented famous ADM system Tor-M2KM at Dubai Airshow 2023. Kupol is one of the leading enterprises of the Russian military-industrial complex, the leading designer and manufacturer of the Tor system of air defence missile systems. The plant also manufactures airborne equipment for surface-to-air missiles, provides maintenance services to operating organizations, and repairs and upgrades previously delivered ADM system.

ADM system produced by the Izhevsk Electromechanical Plant Kupol is in service with the Russian Army and coastal units of the Navy, as well as with the armies of two dozen countries on three continents. The Izhevsk Electromechanical Plant Kupol continuously searches for ways to further improve the effectiveness of its air defence systems, which allows them to successfully counter modern and advanced air attack weapons.

Abandoning the chassis allowed to significantly reduce both the cost and weight of the product. The weight of the module is more than half of the basic caterpillar version and is only 15 tons. According to one of the mandatory regulations, the same weight of snow a flat roof of a 100 m^2 house should be able to withstand in areas with average snow load.

That is, Tor-M2KM can be placed on the flat roof of any house built in accordance with the rules and regulations (perhaps – the simplest system of weight distribution is required, and of course – regular snow removal is necessary). The Tor-M2KM can be lifted to the roof by a Mi-26 helicopter or by a loading crane of appropriate lifting capacity. Wired communication between the combat modules and with the battery command post (it is located on the ground) can be provided by means of conventional masts and towers, including those built on the roofs of neighboring houses. Thus, there are no serious difficulties in implementing the old idea of flaktrums on a new technical level.

Such characteristics of the ADM system Tor-M2KM autonomous combat module as low deployment time (3 minutes – a world record), which makes it possible to repel a surprise air raid, high speed of airspace surveillance (1 antenna rotation per second – the world's best record), which makes it possible to react quickly to the changing situation, low reaction time from target detection to SAM launch – 5-10 seconds, which is especially important when working against low-flying targets, which are detected later than low-flying air assault weapons, are also fully compliant with the tasks of providing air defence of strategic facilities and infrastructures.

Due to its peculiarities, the ADM system Tor-M2KM has a significantly expanded area of application. It can be installed on a railway platform or a ship deck, which will provide reliable air defence cover for the transport of valuable cargos. The ability of the new and latest ADM system of Tor family to operate at sea and from the shoreline against targets flying over the sea has been proven in practice. This has been achieved thanks to the introduction of new algorithms for the combat operation of the computer system, which allow levelling the impact of wave rolling.

One company of the Almaz - Antey Air and Space Defence Corporation, JSC presented at Dubai Airshow 2023 a numbers of all-round mobile radar stations with high performance in detecting UAVs and low-altitude air attack weapons, made, among other things, using stealth technology. Among the most popular models are the newest 'Podlet-K1KE' station, as well as the 'Kasta-2E2' station and the 'Gamma-S1TE' radar. Among the most striking main characteristics of these stations is the target detection range. For example, the 'Podlet-K1KE' has a detection range of more than 300 km, an altitude of more than 20 km, the station has a very high accuracy in detecting drones of various classes in completely different conditions and landscapes.

The undeniable advantage of these stations is mobility. For example, the deployment time is only 20 minutes, which is extremely important, especially in a combat situation. Another important distinguishing feature of the station is the ability to connect up to three fully functional remote operator workstations. The 'Podlet-K1KE' was successfully tested in various conditions, including in combat conditions and abroad, where it showed itself at a very high level.

It is need also note that the 'Podlet-K1KE' has been adopted and is effectively used by the Russian forces. Company offers foreign customers an export option. There is considerable interest in it, especially since the station can operate in various landscapes and in a very wide temperature range, from minus 40 to plus 40-50 degrees Celsius. **/RA&MG/**

MADE IN RUSSIA: HIGH-TECH DEFENSE SYSTEMS FOR MIDDLE EAST

The leading Russian producers traditionally have been demonstrating at the Middle East's major defense expos their latest high-end technologies and innovations. The World Defense Show is no exception. Let us take a closer look at the Russian aerospace and air defense technologies, through the eyes of the Arab media.

The Arab states show interest in almost the entire range of Russian military products, said Director of the Federal Service for Military-Technical Cooperation (FSMTC of Russia) Dmitry Shugaev, in the interview to **RAMG**.

'Arab states and especially the GCC countries traditionally show interest in almost the entire range of Russian military products. These include, among other things, various air defense systems, army materiel, anti-tank missile systems, as well as small arms,' – said Dmitry Shugaev.

'Middle East countries are Russia's traditional and important partners. Rosoboronexport is implementing a lot of military-technical cooperation projects in the region,' said Rosoboronexport's Director General Alexander Mikheev at IDEX 2023.

At World Defense Show 2022 Rosoboronexport organized an exhibit of Russian defense products in the Kingdom of Saudi Arabia for the first time. At its stand, Rosoboronexport showcased pieces of armament for all services of armed forces. Among them were scale models of the IL-76MD-90A military transport aircraft, Mi-28NE attack helicopter and the Orion-E reconnaissance/strike unmanned aerial vehicle, Karakurt-E small missile ship, Project 1650 Amur class diesel-electric submarine, and a version of the Msta-S self-propelled howitzer chambered for the 155 mm caliber that is common in Saudi Arabia. In addition, the models of mine-protected wheeled armored vehicles and an electronic warfare system for countering small-sized drones were demonstrated at the Russian stand.

Dubai-2023 & IDEX-2023

The leading Russian producers traditionally have been demonstrating at Dubai Airshow and at IDEX their latest high-end technologies and innovations. For example, the Dubai Airshow in 2021 became the site of the international premiere of the Russian brand-new MC-21 airliner and other aircraft.

At Dubai Airshow 2023 the single Russian pavilion covered a total area of over 750 square meters, where Russia's 13 largest defence manufacturers showcased 250+ models of modern weapons and military equipment. As **Al Defaiya** reported, IL-76MD-90A(E) military transport aircraft, the latest air weapons for the fifth-generation fighters, including the RVV-MD2 and RVV-BD air-to-air guided missiles, the Kh-69 cruise missile, as well as the world's best Ka-52 attack helicopter with a line of air weapons were presented for the first time.

The IL-76MD-90A(E) military transport aircraft is multifunctional and has been successfully used for a wide range of missions, including for special and airdrop operations. It can carry up to 60 tons of cargo to a distance of up to 4,000 km, and 20 tons – to 8,500 km. During demo flights, the Ka-52 scout/attack helicopter, showed visitors the elements of piloting available only for a coaxial helicopter: flat turn towards the target, lateral movements at high speeds and deep sideslip with a negative pitch angle. In the unmanned aerial vehicles segment, Rosoboronexport presented the Orlan-30 unmanned aerial system in the outdoor static display area, and the Orion-E reconnaissance/attack UAV and KUB-E loitering munition in the pavilion.

'In the air defence segment, JSC ROSOBORONEXPORT is exhibiting a wide range of air defence and electronic warfare systems. They can be used both independently and as part of a layered air defence system. The Russian exhibit includes the S-400 Triumf and S-350E Vityaz air defence missile systems, the Viking surface-to-air missile (SAM) system and various versions of the Tor SAM system produced by the Almaz-Antey Air and Space Defence Corporation. A line of air defence equipment from the High Precision Systems holding company, incorporated into Rostec State Corporation, will be represented by the Pantsir-S1M self-propelled anti-aircraft gun/missile (SPAAGM) system, Igla-S and Verba man-portable air defence missile systems,' wrote **Al Defaiya**.

Arab media also paid attention to the Rosoboronexport's new export product: an integrated survival and self-defence system for aircrews of aircraft and helicopters who have ejected or found themselves on the ground after an emergency landing. A key element of the new system is a 5.56mm Kalashnikov AK-19 shortened assault rifle.

IDEX-2023 also featured a large-scale display of Russia's leading defense industry enterprises.

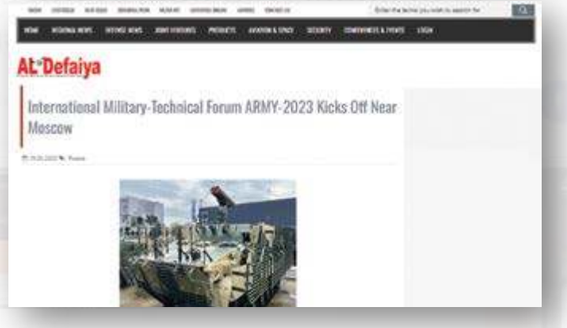
Al Defaiya: 'Representatives of the Army will be shown weapon stations for equipping various armored vehicles, in particular, a full-scale model of the AU-220M 57 mm multipurpose remote weapon station. In addition, visitors to the Russian pavilion will be able to see the T-90MS MBT and the Sprut-SDM1 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… As part of its small arms stand, Rosoboronexport will display 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 law-enforcement weapons: the ORSIS-375ST sniper rifle and the ORSIS F-17M and ORSIS 12.7 mm high-precision carbines.'

Russian counter-drone systems, exhibited at the Rosoboronexport stand, were also expected to attract a great deal of attention, added **Al Defaiya**.

ARMY-2023

The IXth International Military-Technical Forum ARMY-2023 was widely covered by Arabic military media.

'Almost 1,500 enterprises presented about 28,000 samples of military and dual-use products. The Forum is attended by 69 foreign delegations, 29 of which are headed by Defense Ministers and Chiefs of General Staff,' reported **Al Defaiya**.



In its large analysis of the results of the ARMY-2023 **Battle Tested Weapons at ARMY-2023 Al Defaiya** noted, that Rosoboronexport signed a number of contracts for the amount of about $600 million.

Al Defaiya: 'Besides, at the ARMY-2023 forum Russia's state-controlled special exporter conducted presentations for more than 30 foreign delegations and reached agreements on industrial cooperation which includes joint production of Kalashnikov assault rifles, armored vehicles, guided missiles on the territory of customers, as well as the installation of Russian unmanned combat modules of various calibers on the partners' chassis'.

'In 2023, as part of its exhibit, Rosoboronexport has allocated a separate place for displaying such weapons. We'll be showing our partners aircraft, air defense and electronic warfare systems, armored vehicles and tanks, artillery, unmanned aerial vehicles and counter-UAV systems, small arms and combat gear and telling them in detail about the experience of their use in combat within information provided by the Ministry of Defense of the Russian Federation. The presented products have undergone necessary upgrades and have been retrofitted taking into account feedback from the zone of the special military operation,' quoted **Al Defaiya** Alexander Mikheev, Director General of Rosoboronexport.

'Company's partners showed keen interest in the MiG-35, Su-57E, Su-35, Su-34 and Su-30SME combat aircraft, Ka-52E helicopter, modernised Mi-28NE, Mi-171Sh, Ka-226T and Mi35P helicopters, as well as Orion-E, Orlan-10E and Orlan-30 UAVs and counter-UAV assets. Russian air defence equipment attracted particular attention from foreign delegations at Army 2023. Upon requests from partners, Rosoboronexport presented the S-400 Triumf, S350E Vityaz air defence missile systems (ADMS), Viking SAM system, various versions of the Buk and Tor SAM systems produced by the Almaz-Antey Corporation, as well as products from High Precision Systems,

a subsidiary of Rostec – PantsirS1 and Pantsir-S1M self-propelled anti-aircraft gun/missile (SPAAGM) systems and their naval version – the Pantsir-ME AAGM system, which has recently successfully passed official tests and is being installed on Russian ships, as well as the Verba and Igla-S MANPAD systems,' – reported **Nation Shield**.

Defence 21 wrote on the counter-precision guided munition (counter-PGM) systems developed and produced by Russian defense industry to guests and visitors of the ARMY 2023 Forum.

'The experience of military conflicts shows a rapidly growing trend towards the use of land-, air- and sea-based precision guided munitions. With their stealthy signature, ability to maneuver and penetrate various air defenses, smart missiles and bombs can inflict significant damage on military, economic, and infrastructure facilities. Russian defense companies have developed and produce high-tech systems able to counter the most advanced PGMs. Their effectiveness has been proven in real combat conditions,'- quoted **Defence 21** Alexander Mikheev.

Defence 21 mentioned, that the jamming modules of the Pole-21E electronic countermeasures (ECM) system designed to protect strategic assets and infrastructure against pinpoint strikes by PGMs, as well as the R-330Zh automated satellite communication/navigation ECM system are in high demand.

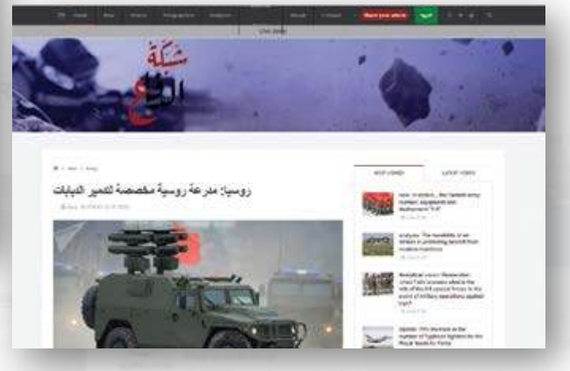
Nation Shield added, that these systems can effectively protect the covered facilities from single and massive strikes by any precision guided conventional-warhead weapons fitted with various guidance systems, including when the enemy intensely deploys countermeasures.

Russian weapons – evaluation by Arab media

Specialized military-technical media of Arab countries in recent years have published a lot of materials on the features of modern Russian weapons of all types.

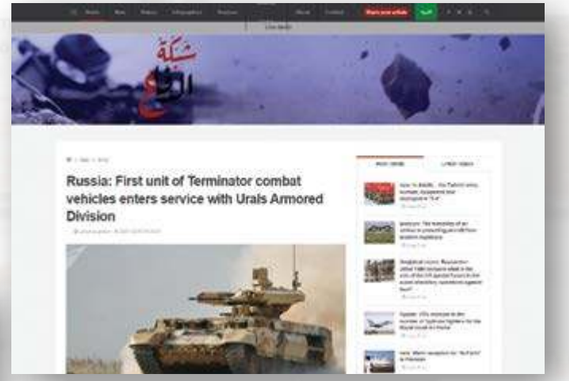
The Egyptian **Defense Network** in its **'Russian armored vehicle designed to destroy tanks'** story analyzed capabilities of Kornet anti-tank guided missile system installed on the MRAP vehicle chassis.

'Russia has a distinctive armored vehicle dedicated to confronting enemy tanks and is described as a tank destroyer. This vehicle is equipped with the Kornet anti-tank missile system, and can effectively deal with modern enemy tanks. It was repeatedly displayed during military parades held by the Russian Armed Forces in Moscow's Red Square'.



Terminator tank support combat vehicle became another theme for **Defense Network**.

'Terminator is a multi-purpose armed and armored anti-tank platform that features powerful weaponry, advanced fire control and high maneuverability. The Terminator is capable of hitting lightly armored targets, tanks and infantry fighting vehicles, and works jointly with air defense systems on the battlefield.'

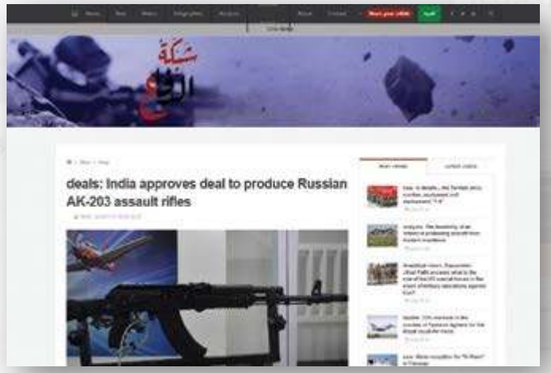


Defense Network also covered the successes of Russia in projects of military-technical cooperation with its partners, for example, Kalashnikov AK203 project with India.

'The deal would make India the first foreign country to produce the AK-200 series of the world-famous Kalashnikov assault rifles', reported in 2021 **Defense Network**.

Nation Shield published a large article on the Su-57 5th generation fighter jet – **'Su-57: Superior Stealth, Advanced Avionics'.**

'Sukhoi Su-57 is a multirole fifth-generation fighter jet, engineered to address a broad spectrum of combat missions encompassing air, ground, and maritime targets. Its operational versatility spans day and night operations, even in adverse weather conditions and challenging electromagnetic environments, while effectively countering enemy air defence systems…. Weaponry is stored in two

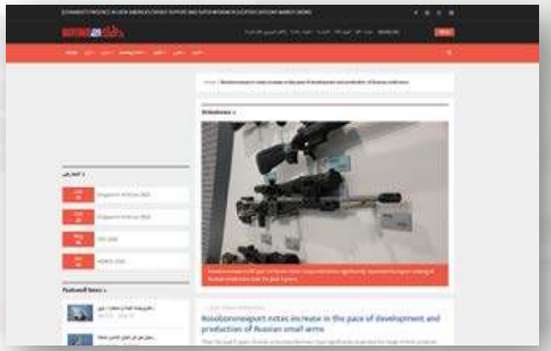


tandem main weapons bays located between the engine nacelles, complemented by smaller bulged triangular-section bays near the wing root. Internal weapons carriage eliminates drag associated with external stores, resulting in superior performance and heightened stealth capabilities compared to external carriage.'

Nation Shield added, that the Su-57 outperformed foreign counterparts in combat effectiveness while maintaining a lower life cycle cost.

'This advantage stems from its exceptional manoeuvrability, supersonic cruising capability, cutting-edge avionics, diverse aviation weaponry, and superior stealth features. … It can use a wide range of air-to-air and air-to-surface munitions, allowing it to perform both fighter and strike tasks. It has the ability to carry out covert actions, due to low level of visibility in radar, infrared and visible wavelength ranges.'

Latest developments in the field of the Russian small arms industry became the theme of the **Defence 21**'s article.



'Over the past 5 years, Russian arms manufacturers have significantly expanded the range of their products. Rapid development of design-and-engineering competencies is due to a high level of competition in the global market, market diversification into narrower segments, production management optimization, as well as the emergence of new players in the national arms market. Thanks to this, today Rosoboronexport can offer its partners more than 90 models of small arms that fully meet the demand from any army and special operations units', quoted **Defence 21** Alexander Mikheev. 'Moreover, there are over 50 models of civilian and service weapons in our export catalog, which are in high demand from police and special agencies of our partner countries. We offer precision rifles, carbines, pistols and hunting rifles on the market.'

Among the latest models promoted by Rosoboronexport on the world market are: Kalashnikov AK-308, AK-19 assault rifles, Chukavin SVCh sniper rifle, Lebedev PLK pistol, Kalashnikov PPK-20 submachine gun, Kord 6P68 and 6P67 balanced-action assault rifles, Kord-338LM bullpup precision rifle and the SHAK-12 heavy assault rifle system. Among civilian and service weapons, precision rifles such as the ORSIS T-5000, ORSIS F-17 and a heavy ORSIS 12.7 model from Promtechnology, the Raptor, Phantom and Elegance Exclusive rifles from Bespoke Gun that debuted in 2023, as well as Lobaev Arms' DXL-5 Devastator, TSVL-8 M5 Dominator and DVL-10 M3 Wolfhound precision rifles occupy top positions in their market segments.

Defence 21: 'All modern models of Russian civilian and service small arms are high-quality, convenient and high-tech products. They combine excellent ergonomics, adaptability to the user and high-performance characteristics. Their design allows convenient and easy mounting of sights and tactical accessories, ensuring their effective use in various conditions. In addition, thanks to unique design solutions, they enable you to fully implement your shooting skills, regardless of anthropometric data and the availability of a variety of clothing, gear and equipment.'

Arabian Defence in its special EDEX-2023 expo edition published detailed articles on the latest Russian air defense systems.

'S-350E Vityaz ('Knight') air defence system has a range of up to 120 kilometers and is designed to defend administrative, industrial and military facilities from massive air attacks. The system is capable of repelling attacks from any direction simultaneously… The increased survivability of the system is ensured by the separation of combat assets over a sufficiently large distance, as well as the ability to maneuver and change position in a short time,' wrote **Arabian Defence** on the S-350E SAM system. /RA&MG/

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