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Russian Kornet-EM: Deadliest Tank Killer with Air Defense Capability

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The Russian military is boosting its anti-armor capabilities. The Kornet-EM (AT-14 Spriggan) has gone through the final phase of testing to prove it is capable of effectively destroying ground and air targets, including helicopters and unmanned aerial vehicles.

One of the missions is to protect the long range air defense assets, such as S-400 and S-500, on the march in any kind of weather, day or night, from attacks by teams of special operators, armored vehicles and drones. The portable-transportable launcher of the Kornet-EM can be installed on wheeled and tracked vehicles.

Mounted on the Tigr (Tiger) armored vehicle's chassis, the Kornet-EM system was made public for the first time during the Victory Day Parade in Moscow's Red Square on May 9, 2015.

The missile system can penetrate explosive reactive armor from 1,100 mm to 1,300 mm and offers high immunity against jamming. It is designed to destroy advanced and modern tanks, light-armoured vehicles and fortifications. It can also engage surface-level marine and low-speed aerial targets at ranges between 150 m and 10,000 m.

The Kornet-EM is available in two configurations, which include an automatic launcher for deployment on carriers and a transportable launcher for combat operations under different environmental conditions. As an anti-tank guided missile (ATGM) system for ground forces, the Kornet is deployed by a two-man team. But depending on the circumstances a single person can assemble and fire it. The two-man setup involves one carrying the launch tube loaded with a missile while the other carries the fire control system and day/night sight on its adjustable tripod. The Kornet was designed to conceal its operator who could aim it while either crouched or lying prone behind cover. This is why the launch tube is mounted above the fire control system.

The twin Kornet-EM salvo firing unit mounted on the vehicle's platform carries an ammunition load of 16 pieces, including eight ready-to-fire missiles.

The automatic launcher is controlled by an automatic and laser beam riding guidance system. It is fitted with high resolution cameras and third generation thermal imaging sight. Each launcher module weighs 75.2 kg. The automatic launcher can lay missiles at an azimuth angle of $\pm 180^\circ$ and elevations between -5° and $+45^\circ$ for ranges between 200 m and 15,000 m. A sighting channel with variable zoom factor 12x and 20x is fitted to the Kornet-EM portable-transportable launcher to increase the range of target detection and reduce sighting errors. The thermal imaging sight design is based on the matrix photo-detector design equipped with thermal enclosure system. The thermal imaging sight can continuously operate for approximately 1.5 hours and can be cooled in just seven minutes. It uses the power generated by the battery. The Kornet-EM also features a laser beam riding guidance system. Its laser-guided system makes it extremely difficult to counteract.

The launcher engages the targets automatically and can perform salvo firing at two targets simultaneously, increasing its rate of fire and decreasing the number of vehicles needed for a

mission. The two-missile salvo is intended to either defeat active protection systems or to ensure a single tank's destruction in the absence of an active protection system.

«The principle of the Kornet's operating process is quite simple. The complex's launcher directs a laser beam at the target. The missile's target seeking device 'sees' this beam and hit the target, following the laser beam», an editor of the Militaryrussia.ru information website, Dmitry Kornev, told Russian newspaper Izvestiya. *«The missile launcher is equipped not only with an infrared thermal imaging camera, but also with an automatic target tracking system, which independently keeps the target in the laser beam until it will be destroyed».*

Indeed, the main thing about this system is its simplicity. All an operator has to do is open the console and push a button to deploy the launcher. The joystick is used to move the crosshairs to the target and then the track button is pushed to lock the system onto the target, which is engaged just by pressing the fire button. If the target starts moving, the system will automatically retain lock and follow the target. The operator can deploy the other launcher and engage another target or the same target with a second missile. When the missile (or missiles) impacts the target, the launcher can be retracted and the system can be moved to a different launch position in minutes. Just as simple as that.

There are two different missiles with accuracy less than 5 meters. A standard anti-tank missile with tandem HEAT warhead has a range of 8 km. It penetrates 1 100 - 1 300 mm behind ERA. Its size is intimidating. With a 152 mm diameter it is one of the largest ATGM's ever built. This feature is meant to defeat the threat posed by Explosive Reactive Armor (ERA) on modern tanks. The second missile has a thermobaric or incendiary warhead and a range of 10 km. This munition releases a fine spray of fuel before denotation. The resulting explosion creates a rapidly expanding fireball that literally consumes all oxygen within an area. Such missiles would be used against «soft» targets such as buildings, exposed infantry, or light- or non-armored vehicles such as trucks.

Modern tanks counter the threat of most ATGMs with an external layer of so-called reactive or explosive armor – essentially, boxes of shaped charge explosives. When an ATGM detonates against such armor, the tank «reacts» by automatically exploding its own charges. The force of the explosion is intended to push the intense heat from ATGM's lethal blast away from the tank's metal skin, protecting the crew inside. But the Kornet defeats explosive armor by using dual warheads of shaped charges. The first destroys the tank's protective layer of explosives, allowing the second warhead to burn through the metal beneath, with catastrophic results. Well-trained soldiers are able to launch up to two missiles per minute by merely discarding the used launch tube and attaching the system's laser-aiming device onto a new missile.

Due to its very high speed and the precision of the laser illumination system, as well as a missile moving at a speed of more than 320 meters per second, the Kornet-EM is capable of destroying not only a tank, but also high-speed combat helicopters and drones, which are characterized by high maneuverability.

The ATGM has already won big kudos abroad. Algeria, Bahrein and Lebanon are among the countries that plan to buy it.

Export versions of Russian antitank missile systems of the previous generation have already been tested in combat. In particular, the *Al-Masirah* Yemeni TV channel published several videos of the Yemeni Armed Forces' attacks on the Saudi military positions, during which missiles of the antitank complex destroyed several military vehicles, including one of the most protected tanks in the world, the M1A2 Abrams.

The Kornet-EM version is one of the deadliest laser-guided ATGMs today with the capability to stop a heavily armored tank in its tracks or hit a low altitude aerial target. There is no protection against it and no way to escape the hit. The mobile, fast, maintenance-friendly, reliable, versatile and the most modern weapon will make ground forces much more potent in conventional warfare and ensure soldiers rely less on firepower from the air, which is not assured in a future conflict. The Kornet-EM is a good example of Russia's ability to achieve technological breakthroughs.