

## 24-Jan-17 The Russian Army Has Redesigned All Its Armored Forces

### Description

By Valentin Vasilescu

Translated by Alice Decker

Originally posted at Algora Blog.



The new Russian Armata T-14 main battle tank appeared in public for the first time on May 4, 2015, at the final rehearsal for the military parade on Red Square. Along with the Armata T-14 were several new armored vehicles, the T-15 Armata-IFV (infantry fighting vehicle), the BTR / BMP Kurganets 25-IFV, the Boomerang 8 × 8 APC, the BTR-MD Rakushka and BMD-4M (for paratroops) and the 35 2S Koalytsia self-propelled gun. The Armata T-14 tanks at the parade in Moscow were pre-series, for equipment testing purposes, and did not have all the systems mounted on them. But the Armata T-14 tanks to be received by the Russian army will have them all. And their equipment will have to meet the performance targets required in the specifications. The Russian army has already ordered a first batch of 100 Armata T-14 tanks; they began performance trials in late 2016 and will be operational by 2018.

In this way, Russia shows that it has redesigned its entire armored force. The General Staff of the Russian army aims to replace all the armored vehicles left over from the Soviet era and those designed immediately after the collapse of the USSR. So 70% of the technology used by Russian ground troops is being replaced with the latest generation of armored vehicles. Meanwhile, the vehicles replaced by the Russians are seen and will continue to be seen in the equipment of the armies of NATO countries that are former members of the Warsaw Pact (Romania, Bulgaria, Slovakia, Poland and Hungary) and the former Soviet republics (Moldova Georgia, Ukraine, Belarus, the Baltic States).

### 1. The Need to Build New Russian Armored Vehicles

The Israeli–Arab wars in 1967 and 1973 and the Vietnam War, in which neighboring countries were also involved, resulted in massive purchases of US M60A3 tanks and the Soviet T-64 and T-72. But there was also the rapid design of three successful new vehicles: the German Leopard 2, the Soviet T-80 and the American M1A1. The treaty on the reduction of conventional weapons in Europe obliged the former members of the Warsaw Pact, which later became NATO members, to give up many of their Soviet tanks. Currently, the two Western types mentioned (the Leopard 2 and M1A1) have reached the limit as to any upgrades that could be made. It is now cheaper to design a new vehicles than to continue building on the same line. The same is true for the American M2 Bradley IFV or Stryker APC.

The Stryker appeared in 1972 and is part of the Piranha family produced by the Swiss company MOWAG, now part of the American concern General Dynamics–Land Systems. It became part of the US Marines infantry arsenal in the early 1980s, and was used in the invasion of Panama (1989), the First Gulf War (1991), and the invasions of Iraq (2003) and Afghanistan. The Stryker APC provides protection against projectiles of up to 14.5 mm. In the front, the shield is reinforced, and it is resistant to projectiles up to 20 mm caliber. The floor is also reinforced to withstand landmine explosions and IEDs up to 8 kg. Neither the US nor Germany has any new tank, IFV or APC in the planning or design stages.

The Armata T-14 is different from previous types of Russian tanks. It weighs 57 t, has a low silhouette, and a maximum speed of 90km/h with a range of 500 km. It tackles slopes with a 60-degree inclination and passes over obstacles 1.3 to 1.5 m high. The T-14's turbodiesel engine is a version of the T-90 MS Taghil that reaches 1,800 hp. The coating was also borrowed from the T-90 MS Taghil: it is painted with a special rubberized Nakidka primer that is radio-absorbent and reduces the thermal footprint.

## **2. The Armata T-14 Tank's Suspension**

The T-14 has Russia's most modern suspension, controlled by a microprocessor. One of the configurations created by the suspension is "seated," which gives the tank a very low profile when underway and better traction on a straight course. Another configuration is "raised," in which the front is higher than the rear, used in maneuvering over obstacles. The T-14 has an 8-speed (or more) automatic transmission, so there is no need for a manual gear shift. By comparison, the US M1A2 Abrams tanks and Germany's Leopard 2A5 have 4 forward speeds and 2 in reverse.

## **3. Types of Armor Used by the Armata T-14**

The main objective in designing the T-14 army was full crew protection, unlike the T-72 and T-80 where the level of crew protection was low. No crew member is positioned in the turret. The three crew members are in the enclosed and well reinforced compartment. The armor itself (of the armored crew compartment in the Armata T-14) consists of layers of composite, like a sandwich, made with ceramic, plates of titanium–steel alloy, and CNT – carbon fiber nanotube (most likely based on hybtonite, a nanoepoxy resin). Like the T-14, the Leopard 2A5 tank has Chobham type armor, using a 3rd generation multilayer composite which includes steel, tungsten and plastic, reinforced with ceramic components. In tests conducted by the US Army, the armor of the Leopard 2A5 tank demonstrated that it provides twice as much protection from kinetic projectiles as the American M1A2 Abrams tank (equivalent penetration depth 350 mm versus 650 mm).

The operative version of the Armata T-14 also has additional ERA armor (explosive reactive armor) that was not shown on the tanks on display during the parade. This armor, 600–1000mm thick, is called Relikt and it neutralizes the cumulative effect of antitank shells or missiles. The cumulative effect of anti-tank shells or missiles is to penetrate by melting the actual armor itself and then exploding inside the armored compartment. Relikt is constructed of RHA (rolled homogeneous armor) panels mounted at an angle tilted toward the front. ERA also protects the turret, the rear and the sides of the Armata T-14 tank, where the armor itself is not as thick. The Leopard 2A4 tanks that the Turkish military bought from Germany did not have this ERA armor. Between November 2016 and January 2017, Turkey used the Leopard 2A4 tanks in offensive operations to capture the Syrian city of Al Bab that was occupied by the Islamic State. In urban areas in Al Bab, the Turkish infantry had no room for maneuver in order to synchronize with the Leopard 2A4 armored vehicles, and the tanks fell into an Islamic State ambush. Turkey lost ten German Leopard 2A4 tanks in Al Bab, hit from the side and rear by SPG rocket launchers (self propelled grenades) and antitank

missiles. In the war in Yemen, the Saudi army has lost twenty American M1A2 Abrams tanks that they bought from the US and that didn't have ERA armor.

The third type of protection for the Armata T-14 is optoelectronic; it's called Malachit and serves to blind the infrared- and laser-seeking heads of antitank missiles guided in the optical wavelength spectrum. It uses two automatic grenade launch systems with suspensions of aerosols, which prevents the photoelectric sensors from guiding the missile to the tank in the final stage.

The fourth protection system is a type of APS (Active Protection System) called Afganit and is intended to detonate anti-tank missile warheads and missiles at a distance of 1–2 m from the tank. So Afganit intercepts and detonates anti-tank missiles and rockets before they touch the armor. Afganit uses a small Doppler radar that operates in tandem with a set of sensors in the infrared spectrum to discover targets and measure the distance to them. The Afganit microprocessor system calculates the trajectory of the rocket fired at the tank and fires explosive interceptors back at it.

Afganit can track multiple targets and prepare to destroy two of them simultaneously. The interceptor tubes have a fuel block and a proximity fuse. Unlike other protection systems, Afganit tubes do not produce shrapnel. They use only the blast wave from the explosion to destroy the incoming missile or cause it to explode early. Afganit is a generation ahead of the Shtora, Arena and Trophy APS systems (the most advanced in the world at this time). In the operation to liberate the city of Aleppo, the Syrian army used a company of T-90 MA tanks. In videos posted on the Internet, you can see that the APS on the T-90 MA (Shtora) tanks neutralizes American BGM-71 TOW-2 anti-tank missiles.

#### **4. The Armata T-14 Tank's Weaponry**

The T-14 is equipped with an electrically-operated remote-control turret, in which the main cannon (2A82-1M, 125mm cal.) is mounted — which is superior to the 2A46M 5 on the T-90 MS tank. The gun has a 3-D laser gyroscopic stabilizing system. This cannon is said to develop 30% more kinetic energy than the cannon on the M1A2 Abrams tank (which pierces armor up to 810mm thick) and the Leopard 2A5. The T-14's main gun has an automatic mechanism for cooling the barrel, which enables it to fire at a higher rate than the ones on T-90MS tanks. The gun uses tungsten-core armor-piercing explosive projectiles, with Kitolov 2M laser-guided Sense-and-Destroy (SADARM) antitank sub-munitions, and laser-guided antitank rockets that can be fired at helicopters or low-flying aircraft. Variations on the Armata T-14 tank are envisaged, on which the 125mm-caliber howitzer can be replaced with a 152mm-cal. 2S35 Koalitsiya-SV self-propelled gun. The 2S35 Koalitsiya self-propelled gun is a new Russian weapon with a maximum range of 70 km that uses Krasnopol-2 laser-guided projectiles. As a secondary weapon, the T-14 has another gun, 30mm cal. (firing at a rate of 620 projectiles / min) which was not on the tanks shown at the parade in 2015. Another secondary weapon is a 7.62mm cal. machine gun, remote operated, for anti-air and anti-land use. All the weapons in the turret are automatic loading.

The weapons in the turret are connected to the fire control center, which is equipped with two full sets of HD night vision gear (with video screens protected by anti-laser filters) with x 15–20 magnifying power), a laser rangefinder, and a ballistics computer coupled to wind speed and wind direction sensors. Optoelectronic devices provide a full 360-degree field of vision around the tank. The IFF (friend or foe) identification equipment has two channels (laser and electronic) that send an encrypted digital signal to the target. The laser identifies the target in 0.6 seconds, and if it's a friend, it stops the weapons in the turret from firing.

#### **5. The Armata T-14's Electronic Countermeasures Equipment and Navigation Equipment**

The Armata T-14 has an Electronic Countermeasures suite to jam enemy laser guidance systems. A laser warning receiver locates the light source that guides enemy anti-tank missiles, and it emits a high-powered laser spot that blinds the optical guidance equipment (laser rangefinder, night vision equipment, TV cameras in the visible and infrared spectrum). The Armata T-14 tank also has EMT-7 (electromagnetic pulse transmitter) equipment that short-circuits the electrical sensors that can trigger anti-tank mines from a distance of 5–8m.

The Armata T-14's navigation system displays the tactical situation as a digital map using GPS channels to determine the coordinates of still and moving targets. Its communications equipment transmits and receives information from similar equipment on other T-14, IFV, and APC tanks, and recon and attack helicopters/airplanes and drones. From detection to location (the transmission of a target's coordinates), identification, and attack, takes no more than 9 sec. The Armata T-14 also has electronic combat capabilities featuring a broadband receiver transmitter and a jammer.

## 6. Other Russian Armored Vehicles that Complement the Armata T-14

In practice, the Armata T-14 has certain limitations. A 125mm-cal. rocket weighs 5.6 kg, so the T-14 only has a reserve of 42–50 projectiles. As targets, the T-14 will choose to neutralize tanks, artillery pieces and fortifications on the enemy's territory.

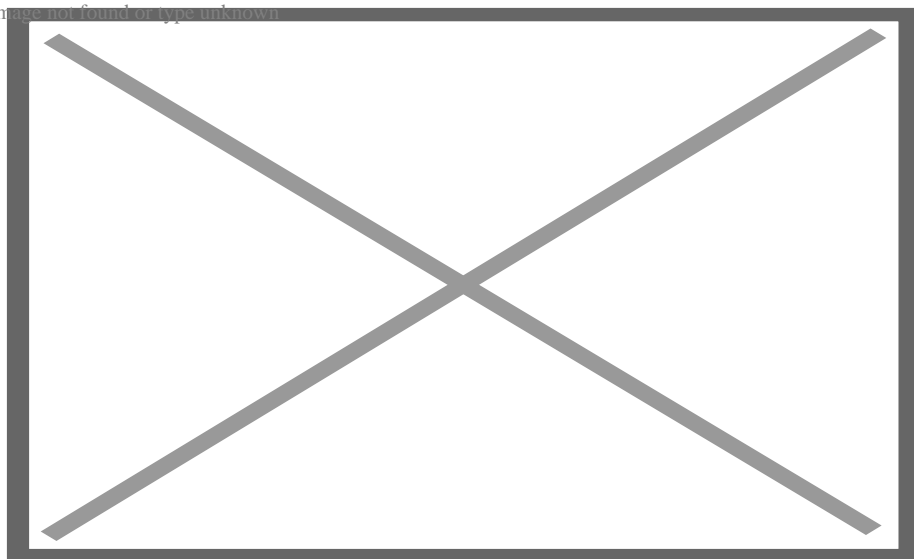
Armata T-15 heavy infantry fighting vehicles fight together with the T-14s to destroy the remaining 70% of the targets, i.e., the enemy's infantry support (artillery groups, tank line-ups and light and highly mobile armored vehicles such as Humvees or PCA Strykers). The T-15 has the same chassis as the T-14, but it is equipped with an Epoch Almaty universal turret, with remote control, the same as the new 25t Kurganets-25 IFV and the 8x8 Boomerang APC. The Almaty Epoch turret is armed with a 30mm-cal. cannon, a 7.62mm-cal. machine gun and a launch container with two Kornet / Kornet-EM laser beam guided-rocket launchers (8–10 km range). The 2A42, a 30mm-cal. automatic cannon, can fire at a rate of 550–800 shots/minute. The mass of a shell is 300–400 g. The Armata T-15, Kurganets-25 and Boomerang each have 500 30mm.-cal.projectiles.



As with the Armata T-14 tank, the T-15 IFV is protected by four types of armor. It uses the same navigation equipment and optoelectronics, the same engine, a similar central fire control, etc. The BTR/BMP Kurganets-25 IFV is for infantry and elite mountain troops; it is powered by a 800hp engine. It has a 3-man crew and can carry eight infantrymen.

Comparing the Armata T-14 to the German Leopard 2, the American M1A2 Abrams, the French AMX 56 Leclerc and the British Challenger 2 tanks, the Russian tank comes out 3/1 ahead. Therefore, Russia plans to acquire 2,300 Armata T-14s by 2020-2025. No European army and not even the US has the equivalent of the Armata T-15. Therefore the Russian army will acquire 4,000 of the Armata T-15 heavy IFVs to serve as weapons platforms with mortars and anti-aircraft missile systems. They may also be usable for towing damaged tanks. Russia also aims to acquire 4,000 of the Kurganets-25 IFV by 2020-2025.

Image not found or type unknown



## 7. Russian Armored Vehicles for the Airborne Divisions are Intended to Surprise NATO

Russia is making great efforts to develop the capability to stop a potential NATO offensive, which would revolve around the extraordinary firepower of the US armored brigades. Russia is counting avoiding being surprised by NATO and hoping, instead, that the Russian army will be able to surprise its opponent. By avoiding surprise, we refer to airborne operations conducted by the US military deep in Russian territory: operations by units of airborne troops carried on board C-5 Galaxy, C-17, and C-130 transport aircraft and tilt-rotor aircraft (MV-22), and units transported by CH-47, CH-53E and UH-60 transport helicopters. These aircraft are accompanied by multi-role aircraft (F-15, F-16, F-22, A-10, AV-8) and by attack helicopters (AH-64, OH-58 and the AH-1W/Z used to “hunt” Russian armored groups that are near to where the airborne troops landed).

In turn, Russia wants to be able to surprise NATO, which cannot be achieved using the cumbersome Russian armored vehicles described above but with the mobility and firepower of Russia’s new armored vehicles for airborne troops. Projecting force at a great distance in a few hours, the Russian paratroopers’ IFVs are parachuted behind US armored brigades. Then Russian paratroops can come around the flanks of the American battle formations. They can create deep breaches or surround and isolate battalions of US armored brigades. Once encircled, these armored subunits become vulnerable and can be destroyed easily. To this end, the Russian paratroops have begun acquiring more light IFV: the BTR-MD Rakushka and the BMD-4M, designed to be parachuted from IL-76 aircraft.

The BTR-MD Rakushka is an IFV that weighs 13t and is capable of running at 70 km/h and crossing streams of water. It can safely transport a commando group of 13 paratroopers, or 2 tons of ammunition. It is armed with a PKTM 7.62mm machine gun and a .30mm automatic grenade launcher. To provide fire support for the BTR-MD Rakushka, the paratroopers have another IFV, the 13 ton BMD-4M. The BMD-4M is armed with a 100mm turret-mounted cannon that launches regular projectiles and also laser-guided anti-tank missiles (9M117 Bastion). And in the turret the IFV also has a 30mm cannon and four banks of guided anti-tank missiles.

In addition to the BMD-4M, Russian amphibious forces have fire support from the Sprut-SD light tank (with a mass of 18 tons), armed with a 125mm cannon that can also launch laser-guided antitank missiles (the 9M119 Svir). An IL-76 transport plane can parachute two such tanks every time it flies. For greater mobility, Division 106 from Tula (a city located 165km south of Moscow) has additionally selected wheeled armored vehicles (6x6) with a speed of 90–130 km/h (the UAMZ 5313-Kolun, UAMZ 4901-Toros and the Typhoon MRAP).

## 8. Russian Counter-Battery Fire Equipment for Parachute Troops

To achieve its aim, Russian paratroops need maximum precision at night or in fog. They have modern equipment for

target detection and identification in the area into which they are parachuted. These devices are known as counter-fire artillery. Reconnaissance subunits of the Russian paratroopers create mobile outposts capable of creating a digital map in real time using GPS coordinates from devices on the enemy's vehicles, especially normal and reactive artillery and tanks. Using a data line, Russian reconnaissance subunits transmit the coordinates of a target to fire support installations up to 50 km away.

The new reconnaissance system on the "PRP-4A Argus" self-propelled artillery was obtained by mounting an IL120-1 radar on the BMP-1 (IFV), instead of the turret. The equipment also has electro-optical night vision devices coupled with two 1D14-1 periscopic laser rangefinders, placed one in front and one in back. The crew consists of commander, mechanic-driver, an operator for the reconnaissance radar system and one for the electro-optical sensors. The two sensor operators have KL-85 multifunction displays and are connected to Russian military telecommunications satellites. The combined sensor equipment has a 360° field of vision with  $\pm 5^\circ$  elevation for determining the coordinates of enemy artillery and armored vehicles up to a distance of 20–25 km and isolated groups of soldiers at up to 7 km. For jamming antitank laser-guided missiles launched at it, the PRP-4A Argus has a 1PN125 stroboscopic laser transmitter and 3VD35 grenades that produce a curtain of aerosols.