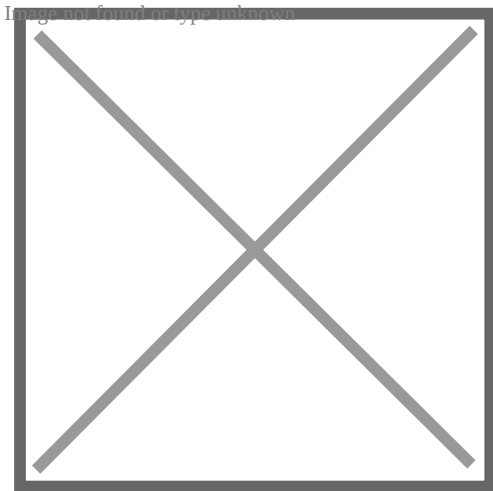


19-April-17 – After Six Years of War, The Syrian Army Has Effective Anti-Rocket Missiles

Description

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The Role of Anti-Tank Guided Missiles in Syria

Since 2012, Syrian rebels have taken control of several of the Syrian army's weapons depots, capturing ATGMs (anti-tank guided missiles) manufactured by Russia such as the 9M113 Konkurs and 9K115-2 Metis-M. Later, in 2014, Saudi Arabia which already had over 15,000 ATGMs (nearly 10,000 of them being BGM-71 TOW 2s) acquired another 14,000 TOW 2s (BGM-71D) and TOW 2As (BGM-71E) from the American corporation Raytheon, for which they paid nearly \$ 1 billion.

It just so happens that, in 2014, the “moderate” Islamist rebels supported by the Gulf states, Turkey and the US were supplied with 2,000 to 3,000 ATGM systems of various types, including the 9K111 Fagot [Russian for “bassoon”], the 9M133 Kornet, the 9M113 Konkurs, and the H-8 and H-73C (produced in China), the Milan (from France–Germany) and the BGM-71 TOW2.

The media have shown evidence that the FSA rebels (Free Syrian Army) alone received about 790 BGM-71 TOW 2 systems from Saudi Arabia from April 4–15, 2014. They would have been delivered clandestinely at the Turkish border with the complicity of Qatar and the US.

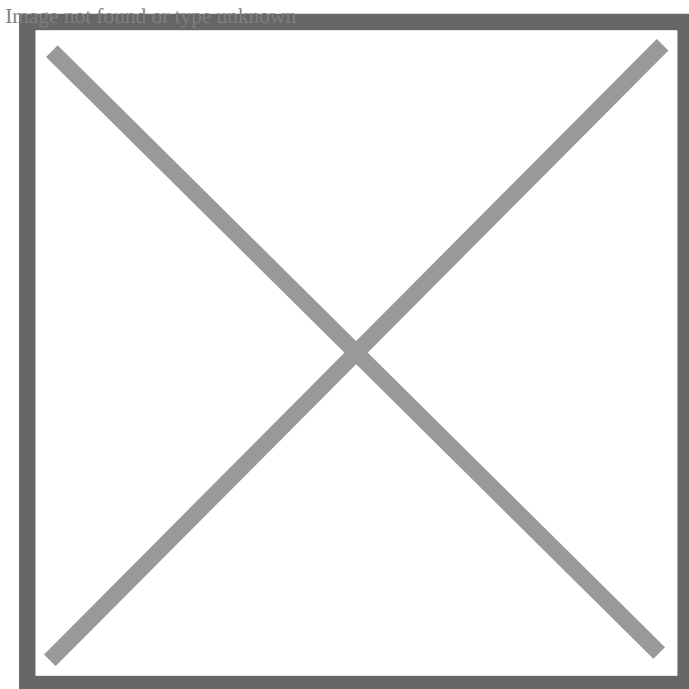
Following the Russian air force intervention in Syria at the invitation of Bashar Al Assad in November 2016, ATGM shipments to rebel groups were increased exponentially. Another nine Islamist groups including Al Nusra (Syria's Al-Qaeda subsidiary) have in their possession nearly 2,000 BGM-71 TOW2

systems.

According to Armament Research Services,

The US-produced TOW[1] missiles are in use by many armed forces, including Syria's regional neighbors Bahrain, Chad, Egypt, Ethiopia, Israel, Kuwait, Lebanon, Morocco, Oman, Saudi Arabia, Turkey, UAE, and Yemen.

The Defense Logistics Agency's WebFLIS service shows that BGM-71E-3B missiles have seen service with both the US Army and US Marine Corps, with the Marines having recently become the primary managing organization for this item. This particular example is marked as having been produced by Hughes Aircraft Company as part of a contract first awarded in January 1990 (see contract number, also visible in the image below). This contract was taken over by Raytheon when Hughes was purchased by them in 1997 and has been re-awarded seven times since its initial issue, with the most recent award in 2004. Consequently, the missile was probably produced between 1990 and 1997 [2].



Electro-Optical and IR Countermeasures

ATGMs, especially the BGM-71 TOW 2, used in urban combat, have become a nightmare for Syrian tank operators because they have caused significant losses and damaged the Syrian army's morale. For example, in February 2015, during the offensive to take Idlib, the ATGM-armed Islamic rebels destroyed about 40 Syrian army tanks.

This was possible because the Syrian army's old T-53 and T-62 tanks had little protection, mainly some armor on the tank chassis. In order to reduce the cost as much as possible, the newest tanks (T-72) were ordered from the Soviet Union without any supplementary packages of "Kontakt" or "Relikt"

Explosive Reactive Armor (ERA) applied over their own armor. ERA provides additional protection equivalent to 620–700 mm of RHA (Rolled Homogeneous Armor). Neither did the Syrian tanks have any active-type armor (such as the “Arena” or “Shtora” system found on Russian T-72B3M / B4M and T-90 tanks) that automatically detects, intercepts and detonates antitank munitions before they hit the tank.

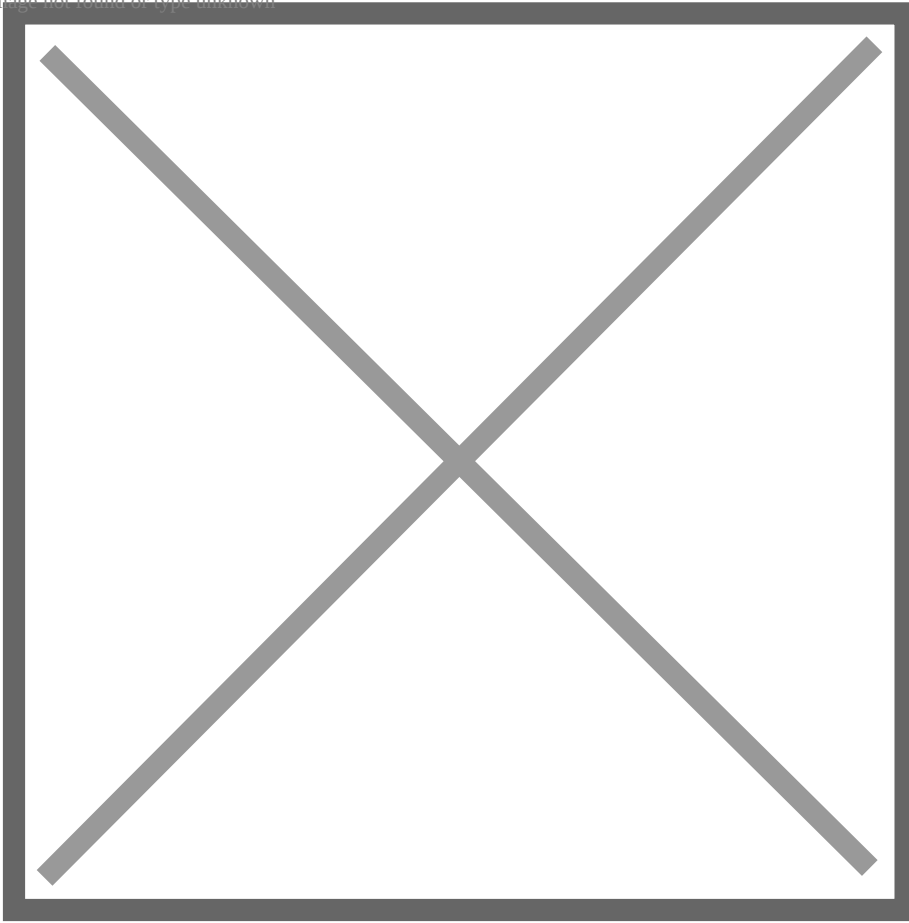
To remove this vulnerability, in 2012 the Syrian Scientific Research Center (SSRC) started a research program to create a jamming device against ATGMs that use the SACLOS (Semi-Automatic Command to Line of Sight) principle. ATGMs with 2nd generation SACLOS require the operator to keep his weapon's target in the weapon sight until the missile has impacted. ATGMs are capable of destroying tanks and armored vehicles, bunkers, fortifications, buildings and other obstacles. ATGM jammers were available but Syria could not buy them because it was under the UN embargo. The Shtora on the Russian T-90 tank was too complex and the SSRC could not fit on the T-55, T-62 and T-72 tanks.

Instead, in 2014, the Syrian Army intelligence service captured 18 BGM-71 TOW2 systems from the FSA rebels in northern Syria. These were dismantled and studied by the SSRC. The BGM-71 TOW2 has a range of 3,750 m and has a 5.9 kg high-explosive anti-tank (HEAT) warhead which operates in two stages, that is, a small warhead explodes on impact with the tank, then detonates the main warhead. The main warhead emits a jet of gas and molten metal at a speed of 1,500–3,000 m / s which can penetrate armor as much as one meter thick. The BGM-71 TOW2 missile features a xenon lamp and a thermal beacon at the rear, allowing it to be tracked and guided by the sensors and the operator through the IR and thermal sighting and targeting.

The Syrian Sarab System

The Syrian army first used its Sarab-1 (“mirage”) active protection, mounted above the turret on T-62 tanks, near the NSVT 12.7mm heavy machine gun, in its offensive on Khanaser, south of Aleppo (21–29 February 2016). This proved to be a good antidote against the 9M113 Konkurs ATGM used by the Islamic State. The Sarab-1 disrupted the optical command link between the operator and the ATGM sensor, so that the ATGM missiles could not receive the operator's corrections to the trajectory; instead they received false commands transmitted by Sarab-1 via IR and they missed their targets.

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The Sarab-1 system uses several transmitters that cover about 120 ° of the front of the tank. The transmitters are based on high-powered infrared LEDs and uses lenses to focus the light rays. Sarab-1 is a primitive form of Shtora and has shown to have an efficiency rating of over 80%. The Syrian army has also used Sarab-1 to protect its fixed support points (artillery pieces, fortified buildings, etc.) against ATGMs. Sarab-1 was not developed and tested according to the standards of the weapons industry but directly on the battlefield, against Islamic rebels.

Sarab-2

Sarab-2, an improved version, was mounted on the T-62 and T-55 tanks used in the fight against Islamic State near Palmyra. At 2.34 seconds from launch and after traversing approximately 520 m (considered to be its minimum limit of efficiency) the BGM-71 Tow2's IR sensor automatically switches from Large Field of View mode (with an angle of more than 6°) to the Narrow Field of View mode (between 1 and 0.25°). At this stage, the Sarab-2 emits stronger IR beams than those in the rear of the antitank missile (which are tracked by the launcher's guidance system). These false data emitted by Sarab-2 cause the ATGM guidance system to send sudden corrections to the vertical flight and the rocket hits the ground before it gets near the target. Batteries provide 10 hours of operating power for Sarab-2, and its transmitters cover a frontal sector of 180°.

The latest version, Sarab-3, also uses laser beams and protects the tank in a complete 360 ° sector.

The only problem is that the Sarab family has no effect on wire-guided or optical fiber ATGMs, RPGs (Rocket-Propelled Grenades), or portable man-launched rockets.

And Low-Tech Protection

US armored vehicles used in the invasion of Iraq (2003) and in Afghanistan were provided with a steel grille mounted at a distance of 1 m from the vehicle and providing 360° coverage. This solution was effective against RPGs (RPG-7, SPG-9) and some ATGMs, because the projectiles explode on contact with the tank's grille and even if they pierce the armor itself, they do not explode inside the vehicle.

In February 2017, on the outskirts of Damascus, hundreds of Syrian Army vehicles were observed, T-72 M tanks, BMP-2s (IFV), ZSU-23-4 tanks and bulldozers from the 4th Tank Division, with a steel grating mounted on them. Bulldozers with armor plates welded on are used extensively in Syria's urban areas to create the corridors needed to get tanks, armored personnel carriers, and artillery pieces through, past the ruins of buildings.

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