

A CUFI PRIMER: S-400 Missile System



S-400 Missile System – Specs and Implications for US & Israel

Specifications:

Type: Surface to Air Missile (SAM)

Manufacturer: MKB “Fakel” (Russia)

Maximum Range: 250-400km

Warhead: 143kg high explosive fragmentation



The S-400 Triumph (NATO reporting name: SA-21 Growler) is a Russian-made mobile surface-to-air missile system. It is designed to engage aircraft, UAV's, cruise missiles and includes terminal ballistic missile defense capabilities. The fourth generation system of long-range Russian SAMs, the S-400 missile system is the successor to the S-200 and S-300 systems. It has been compared to the US patriot missile system. In 2017, the S-400 was described by *The Economist* as “one of the best air-defense systems currently made.” According to Siemon Wezeman, Senior Researcher of Stockholm International Peace Research Institute, the S-400 “is among the most advanced air defense systems available.”

The S-400 supports four different missiles: the very long range 40N6E-series (400 km), the long range 48N6 (250 km), the 9M96e2 (120 km) and the short range 9m96e (40 km). By comparison, the US Patriot system supports only one interceptor missile with a range of 96 km.

The 9M96E2 flies at Mach 15 (around 5,000 meters per second or 18,500 kph) and can engage targets as low as five meters off the ground. It can also maneuver pulling up to 20 Gs (for perspective, a human can withstand no more than 9 Gs with special pressure suits and helmets and for only a few seconds). It is designed to knock out penetrating aircraft and missiles flying “off the deck” or just above ground and neutralize cruise missiles.

Dr. Carlo Kopp, one of the world's top aerospace experts, says the S-400 has optional acquisition radars designed to defeat modern stealth aircraft such as the F-22 and the F-35. They work by operating in multiple frequency bands including both VHF and L bands that can “see” stealth-protected fighters.

Stealth designs have been built on low-detection by X-band radars, the most common military and civilian radars (others such as C-band – now known as the G/H band – are less prevalent). The F-35 has stealth protection mainly in the front of the aircraft, meaning that when it turns away from its target, it is vulnerable. Eventually, the entire air defense system of the US and its allies, all based primarily on X band, will become obsolete as China and Russia move toward stealth aircraft and missiles.

Implications

With the delivery of S-400 systems to NATO ally Turkey on July 12, 2019, opportunities may have arisen for the S-400 system to be used in training against military aircraft, such as the F-35 fighter jet, that are used by the United States and Israel. While Turkey was set to receive the advanced Lockheed-Martin F-35 fighter jet from the United States, this is on hold for the immediate future.



If Turkey had both F-35s and the S-400 system, the intelligence and technical information that would be gleaned by being able to measure the F-35's capabilities against the S-400 would be catastrophic.

This information would provide Russia with the intelligence to further develop and tweak its systems to counter among the most potent weapons in the US arsenal. Additionally, the F-35 is currently the most advanced fighter being used by Israel. With reports of Turkey deploying S-400 systems to the Syrian border, this could directly impact Israeli capabilities to strike Hezbollah and Iranian targets that already threaten Israeli sovereignty, further jeopardizing the Jewish state's security.

