

Russia has begun crew training for its new S-350 SAM (Surface to Air Missile) system, reports Strategy magazine. S-350 is a mobile, medium range missile system that replaces the S-300PS/PT system which entered service in the early 1980s and the Buk M1/2 which entered service in the 1990s. The S-350 is, in effect, "S-400 Lite". In other words a less expensive SAM system with many S-400 capabilities but not the billion dollar per battery price. S-350 also benefitted from a joint Russia-South Korea effort to develop a new air defense system. That effort eventually fell apart but not before each nation went on their way with valuable tech they had acquired from the other.

Development of S-350 began in 2007 and was expedited by borrowing a lot from the S-400 system. For example S-400 uses several different missiles, all with different ranges. The smallest missile, with the shortest range is the 9M96 which weighs 400 kg (880 pounds), is 4.6 meters long and is 275mm in diameter. The S-350 uses three versions of 9M96. The 9M96E2 weighs 420 kg and has a range of 120 kilometers. The 9M96E weighs 333 kg and has a range of 60 kilometers. Both of these are 5 meters long and 240mm in diameter. The third missile, the 9M100 weighs under 200 kg and has a range of 15 kilometers. The 9M100 is 2.5 meters long and 125mm in diameter. Thus the S-350 launcher can carry more of the 9M100. It is unclear if the 9M100 is in service yet.

Like the S-300 and KM-SAM the S-350 uses a modern AESA radar and very capable fire control system. The Russians got some ideas on the fire control system from the South Koreans, who are one of the most advanced electronics developers in the world. South Korea also develops its own AESA radars. The main Russian contribution to the KM-SAM was the 9M96 missile, which uses a South Korean guidance system. The S-350 search radar is based on one used for the S-400 and is believed to have a range of at least 400 kilometers.

An S-350 battery consists of one or two 50N6A truck mounted search radars, one fire control station vehicle and up to eight launchers, each carrying 12 9M93E or E2 missiles. The launcher vehicles are 8x8 trucks while the radar and fire control system uses a 6x6 truck. A S-350 battery can halt and be ready to fire in five minutes. Russia is believed to have sent an S-350 battery to Syria in 2017 for field testing. The radar was operated but no missiles were fired. The radar can track up to 40 targets simultaneously and guide up to missiles simultaneously at aircraft 16 targets or 12 ballistic missiles. The S-350 claims to have anti-missile capabilities similar to the U.S. Patriot system.

S-350 is the Russian version of the joint South Korean-Russia effort to develop the KM-SAM for

South Korea. KM-SAM entered service in 2018. China was not be pleased because KM-SAM is the first step in a South Korean effort to develop an anti-missile capability similar to what the American Patriot system has. KM-SAM (or just M-SAM) development began in 2001 with the help of a Russian firm. KM-SAM is mobile and each battery has six launcher vehicles each carrying an eight-cell storage-launcher box. Each missile weighs 400 kg and has a range of 40 kilometers. The missile is based on the Russian 9K96 that is used by the S-350. Another vehicle carries the 3-D phased array radar and fire control system (which can track six targets simultaneously). The radar and fire control are South Korean and much improved over the American Hawk systems South Korea has been using since the 1960s. KM-SAM and American Patriot systems will eventually replace the 24 Hawk batteries South Korea has been using for decades. South Korea will continue development of KM-SAM to include a version with anti-missile capabilities similar to the Patriot PAC-3 and eventually surpass even that with a version called L-SAM that is to have an effective range of 150 kilometers and max altitude of 30,000 meters.

The current KM-SAM is a big improvement over Hawk. Each Hawk battery has six towed launchers each carrying three of the 590 kg (1,290 pound) Hawk missiles. In addition there a radar, control center and maintenance vehicles. Since the 1960s over 40,000 Hawk missiles were produced and bought by the nearly 30 countries that used (or still use) Hawk. While Hawk has been upgraded since it entered service in 1959, some countries have gone beyond that. Back in 2011, South Korea revealed that it was working on Iron Hawk II anti-aircraft missile system and some early models were built to replace three existing U.S. Hawk missile battalions. This was what became M-SAM and introduced the use of a launcher truck with missiles in sealed storage/firing containers. The original Hawk did not use the container system. Iron Hawk missiles have a max range of 40 kilometers and a max altitude of 15,000 meters (46,500 feet). The search radar (with a max range of 100 kilometers) guides missiles part of the way before the missiles' own guidance system takes over for the final approach. Because the main military threat, North Korea, is right next to South Korea, Hawk range is not a big issue.