



Russia's Approach to Anti-satellite Weapons and Systems

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Russia has resumed work on anti-satellite (ASAT) weapons and systems, which are able to eliminate military, civilian and dual-capable satellites. Although Russia is promoting planned universal treaties limiting the weaponisation of space, it is also intensifying ASAT research and development. Due to the importance of satellites in modern military operations, Russia will improve these weapons as an element of its "asymmetric response" to the development of U.S. and NATO conventional and missile-defence capabilities.

The contemporary battlefield is highly dependent on communication, reconnaissance, navigation and early warning satellites. The majority of civilian sectors are also dependent on satellites for communication, navigation, and meteorological data. ASAT is usually defined as either kinetic weapons (interceptor missiles and kamikaze satellites) or non-kinetic systems (lasers, and electronic and cyber-attacks). Their military importance might increase further, given the progress of the United States in the areas of new hypersonic weapons and future satellite-sensors for missile defence.

ASAT in Russia's Policy and Plans. Bilateral agreements on strategic arms controls between the Soviet Union/Russia and the U.S. do not regulate ASAT systems. In 1967, due to concerns about U.S. technological advantages, the USSR agreed to sign a multi-lateral Outer Space Treaty, which prohibited weapons of mass destruction in space but did not ban the use of space for military purposes. Neither could ASAT arms control be introduced within the UN Conference on Disarmament in Geneva, which for many years failed to produce a draft treaty on the Prevention of an Arms Race in Space (PAROS). Russian and Chinese proposal in this area were opposed by the United States, which perceived this project as aimed at limiting space elements of the U.S. missile defence system. In 2008, Russia and China also proposed a draft of Treaty on Prevention of the Placement of Weapons in Outer Space and of the Threat or Use of Force Against Outer Space Objects (PPWT), which needed ratification by 20 states, including five permanent members of the UN Security Council. This draft was also rejected by the United States, which saw it as lacking verification instruments and failing to include ground-launched ASAT weapons. Later, Russia, China and the U.S. also proved reluctant to abide by an EU compromise proposal of a Code of Conduct for Outer Space Activities, which would ban signatories from destroying or damaging satellites.

While Russia's unclassified strategies and doctrines do not mention ASAT weapons, the Russian military authorities recognise space as a military domain, crucial in future conflicts. ASAT weapons and systems have clear strategic and military functions. They could prevent enemy reconnaissance and the collection of intelligence data, eliminate advanced military communication and navigation, and neutralise missile-attack early-warning satellites. There is also consensus among Russian military experts that the United States' continued dependence on military satellites is a potential weakness. Russian civilian experts also point out the possibilities of ASAT being used against future U.S. systems in space, especially satellites for command and control of hypersonic weapons, and satellites of advanced missile defence.

Russia's ASAT Progress. In the 1970s, after the USSR's initial successes in space exploration, it introduced Istrebitel' Sputnikov (IS) special interceptor satellites into service. After the collapse of the Soviet Union, plans for IS modernisation, an orbital battle-station and other ASAT systems were halted. The majority of Russia's current research and development is a continuation of pre-1991 projects. Russia officially justifies its renewed projects by the use of ASAT in other states. China carried out a series of tests (initiated in 2007), the U.S. held one test (2008) and India first tested ASAT in March. The Russian Armament Programme for the period to 2027 assumes the introduction of the new Rudolf ASAT weapon, which is likely based on the most intensely tested ground-launched missiles, called Nudol/PL-19. A-235 Samolyet-M ground ballistic missile defence systems and S-400 and next-generation S-500 surface-to-air and missile-defence systems are ASAT capable in low-earth orbit. Furthermore, the ASAT programme is also connected with the renewal of the Kontakt missile project, involving AN inceptor launched by air from MiG-31BM aircraft. According to U.S. intelligence, some advanced and manoeuvrable inspection satellites, launched by Russia since 2013 might also be ASAT-capable. Suspicious activities by these satellites were raised many times by the U.S. at the Conference on Disarmament. France and Italy also protested when Russian satellites approached their Athena-Fidus reconnaissance satellite.

In parallel, Russia is working on non-kinetic ASAT systems, including laser technology to dazzle enemy satellites' sensors, mounted on A-60 aircraft. Russian land forces are also equipped with radio-electronic warfare systems such as Krasukha-2/4 and R-330Zh Zhitel, capable of jamming communication and navigation satellite signals. Work is underway on the next generation of these systems—the Tirada-2S. Since 2014, Russian radio-electronic warfare systems have been widely used. They were deployed during the conflict with Ukraine and intervention in Syria, in Russian-Belarusian *Zapad 17* exercises, and against Scandinavian countries during the NATO *Trident Juncture 18* exercises. In light of Russia's other cyber operations, it might be assumed that the country is equally advanced in cyber-attacks on civilian satellites, which are usually less well-protected than military equipment. It should be stressed that all these non-kinetic capabilities could also allow Russia to carry out covert disruption of enemy military satellites during peacetime, kinetic weapons, on the other hand, are easy to detect during testing, and to identify during open military conflict.

Implications for the U.S. and NATO. Russia is concerned about the United States' growing technological advantage and military domination in space and is proposing international laws aimed at limiting ASAT. At the same time, the Russian authorities are developing kinetic ASAT weapons, which are presented as a response to similar projects carried out by China, the U.S. and India. Russia is currently able to add ASAT functions to missile defence systems such as A-235 and S-400, which can intercept exo-atmospheric warheads. In the next few years, it will also be able to use kinetic ASAT weapons (Rudolf and S-500) against civilian and military satellites in low-earth orbit and to deploy robotic satellites capable of disrupting military and civilian satellites in higher orbits. Russia's ASAT weapons are an element of its "asymmetric response" to the development of the United States' missile defence, new ground-launched missiles and hypersonic weapons. The U.S. is also paying close attention to Russia's visible and advanced non-kinetic ASAT capabilities in terms of electronic and cyber-attacks. These threats from Russia were [among the factors justifying the recent creation of a new space force branch of the military in the United States](#).

The broadening spectrum of Russia's ASAT capabilities also requires a response from NATO and EU states. The Alliance approved a space policy in June, and the next stage might take place at the December meeting of NATO heads of state and government in London, where space will be recognised as a fifth domain of military operations and the Allies will work on a specific space strategy. NATO's doctrines currently see air and space as one, so need to be updated to take account of new threats. Within NATO there is a need to address the implications of ASAT weapons on Article 4 of the Washington Treaty. It may be that non-kinetic disruption of a satellite belonging to any NATO member will be the subject of consultations under Article 4, and the Alliance could decide that the physical destruction of a member's satellite may be deemed an act of aggression that would call for Article 5 to be invoked. Allied exercises should incorporate ASAT-attack and GPS-jamming scenarios in future, particularly when planning large-scale exercises such as the upcoming Defender 20. Poland's armed forces technical modernisation programme for the period to 2035 assumes the acquisition of reconnaissance satellites, so additional protection from non-kinetic attacks might be necessary. The EU institutions and countries should use information campaigns to increase awareness among civilians who rely on satellites vulnerable to non-kinetic ASAT attacks during peacetime or in hybrid warfare.