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Space Power: What is Russia's Military Strategy in Outer Space?

Russia's satellite constellation, of which military apparatuses account for two-thirds, is the world's third-largest. On another front, Moscow is working on a new Anti Ballistic Missile system: Experts suspect this will serve an anti-satellite purpose. Russia has also discovered how to jam and divert US GPS signals. It leads to a necessary question: What exactly is Russia's military strategy in outer space?

The traits and limits of the Russian orbit constellation

As of today, Russia has the third largest satellite constellation in the world – 134 apparatuses. The US, by comparison, has 579 satellites and China – 192. If we combine EU satellites together (218 satellites), Russia's constellation is ranked fourth. However, if we hone in on military satellites, the situation appears somewhat different: 151 military satellites belong to the US, 81 – to Russia and 58 to China.

All in all, EU member states have 35 military-purpose orbit satellites and 18 Galileo navigation-system apparatuses. Truth be told, Galileo predominantly serves a public purpose unlike the American GPS (31 satellites), Russia's Global Navigation System GLONASS (25 satellites) or the Chinese BeiDou (22 satellites). European military forces rely entirely on GPS; Galileo merely serves as a backup satellite navigation system.

Most commercial satellites and remote sensing technology can be used by the military, if necessary. The superiority of the Americans and Europeans is indisputable in this regard. However, it is the size of the military satellite constellation which matters for Russia – it is the second largest in the world, second only to that of the US. Hence, Russia actively promotes the issue of the military use of outer space on the global agenda. Apart from the non-proliferation of weapons of mass destruction and the reduction of nuclear arsenals, this constitutes a means by which its perceived status as a great superpower within the UN can be maintained.

It is worthwhile looking at the composition of the Russian military satellite constellation. Communications satellites make up the lion's share – 42 apparatuses. As few as 6 of these are placed in geosynchronous orbit (GSO, at an altitude of approximately 36,000 km) while a further 5 satellites are placed in elliptical orbit (approximately 40,000 km at the highest point and 1,000 at the lowest). For comparison, 39 out of 43 American military communications satellites are placed in GSO and 3 satellites are in 3 elliptical orbits. All 3 Chinese military communications satellites are placed in GSO.

A satellite in geosynchronous orbit moves with an orbital period matching the Earth's rotation on its axis. Hence, for an observer, the satellite is forever situated over a given region providing coverage that spans dozens of millions of square kilometers. Such a satellite has a continuous connection with land stations and end users. Due to its high altitude, less fuel is needed to keep a satellite in GSO while several such apparatuses are sufficient to provide global coverage (except for polar regions). Therefore, heavy satellites with channels of high throughput capacity and lifespans of 15-20 years are placed in GSO. Satellites in high elliptical orbits are used for connections at polar latitudes. The characteristics of orbit make it impossible to use heavy apparatuses with long lifespans.

It is also noteworthy that both the US and Chinese military can rely on dozens of commercial communications satellites owned by respective national corporations. As few as 17 heavy communications satellites, mainly assembled using European and American parts, are owned by Russian (state-owned) companies. Besides, the US and China make extensive use of land remote sensing satellites (45 and 30 apparatuses, respectively). Russia has as few as 8 satellites of this type. It turns out that the bulk of the Russian military satellite constellation (31 apparatuses) comprises low Earth-orbiting satellites with short lifespans (3-5 years) and low-level communications channel throughput capacities.

For example, Russia also had 81 satellites in outer space in 2014 but their composition was somewhat different. In addition to the 42 connections satellites, a quarter of which had been upgraded by 2017, there were also 4 missile warning system satellites, 4 remote sensing (reconnaissance) satellites and 31 GLONASS satellites in orbit.

All this means that outer space communications and reconnaissance remain the Achilles' heel of the Russian army almost 4 years after the onset of the confrontation between Russia and the US despite Russia's ambitions to become second only to the US not only in terms of military satellites but also with respect to the deployment of conventional armed forces outside Russia. Russia is simply incapable of effectively managing several tens of thousands of troops and providing them with information far from its borders.

Moreover, Western sanctions are also having an effect. There is a ban on selling space electronics manufactured in Europe to Moscow and the latter is now encountering difficulties with its production of a new generation of military communications satellites. All these weaknesses relating to Russian military space systems determine Russia's approach to the further development of its military space program and its foreign policy in this regard.

(De)militarization games?

In order to compensate for existing problems, Moscow needs to extend the lifespan of its military satellites since Moscow finds it difficult to maintain the same number of satellites despite the current (most probably maximum) level of military expenditure. The crux of the matter is that modernization can only be made possible thanks to investment, human resources, and technologies that Russia is unlikely to gain access to in the foreseeable future.

Truth be told, the Kremlin may harbor hopes of cooperation with China. However, it remains unthinkable that such a degree of trust between the two countries, making cooperation in terms of military outer space possible, could exist. Cooperation in the area of military satellite development and production is very limited, even between the US and its NATO allies. Against this backdrop, the situation concerning human capital outflow is more easily managed: the Kremlin may try to stem the flow by imposing new restrictive measures on Russian citizens.

As usual, Russia resorts to its favored tactic of "asymmetric response" in order to limit the technical superiority of the US and to force them to bargain. The method is implemented via several steps. First of all, long-range radars of the missile warning system are installed along Russia's perimeter and the ground-based space surveillance system is developed. Secondly, means of jamming satellite signals in order to reduce the efficiency of space navigation and communications are used on land. Thirdly, satellites capable of navigating low earth orbit (LEO) are being tested. These tests increase uncertainty about Russia's intentions; a surefire way to raise the stakes in the Kremlin's eyes. The same goal is pursued by speculations fueled by Moscow that the missile defense system deployed around the Russian capital will be capable of destroying satellites following its upgrade (the A-135 anti-ballistic missile system will be replaced by A-235).

Against this backdrop, Russia systematically raises the issue of the militarization of outer space in the international arena. For example, a Russian-Chinese international draft treaty on preventing the placement of weapons in outer space (PPWT) was officially proposed in 2008. In addition, the Kremlin closely links the issues of the military use of outer space with the development of missile defense systems by the United States and its attempts to create a global prompt strike system. That is, the Kremlin continues to try and link the outer-space agenda with the issues of missiles and nuclear weapons, just as it did from the 1960s-1980s. Still, the Russian authorities have to understand that the chance of starting even a vague dialogue in this way oscillates around zero, hence, negotiations are by no means the aim of Moscow's initiatives.

It turns out that Moscow's diplomatic pressure on the US is intended to talk up the price and mask the dire state of Russia's civic and commercial activities in outer space. Truth be told, problems in this area are threatening to displace Russia to the margins of cosmic explorations for the foreseeable future which may be avoided by prioritizing the military (albeit artificially inflated) agenda.

Still, it should be made clear that Russia is not creating any special means of destroying satellites. This has no practical sense whatsoever. All the most important communications and navigation satellites are tens of thousands of kilometers above the earth. Hypothetically, at least, intercontinental ballistic missiles would be required in order to destroy them. However, in order to raise the stakes, Moscow could demonstratively destroy its low Earth-orbiting satellite. In 2007, the Chinese shot down their old satellite using a medium-range missile at an altitude of 800 km, mind you. In 2008, the Americans destroyed their descending satellite using the Aegis BMD. The Russian authorities are well aware of these facts and may follow these examples, creating a precedent.

To compensate for the Achilles' heel of the military space constellation and its cosmic program in general, Russia has embarked on a peculiar path. While involved in talks over the demilitarization of outer space, Moscow invests in creating ground facilities to control the orbit and to wage electronic warfare by targeting space communications and navigation systems. Unable to develop the country, the Kremlin extrapolates the logic of the besieged fortress onto outer space.

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