

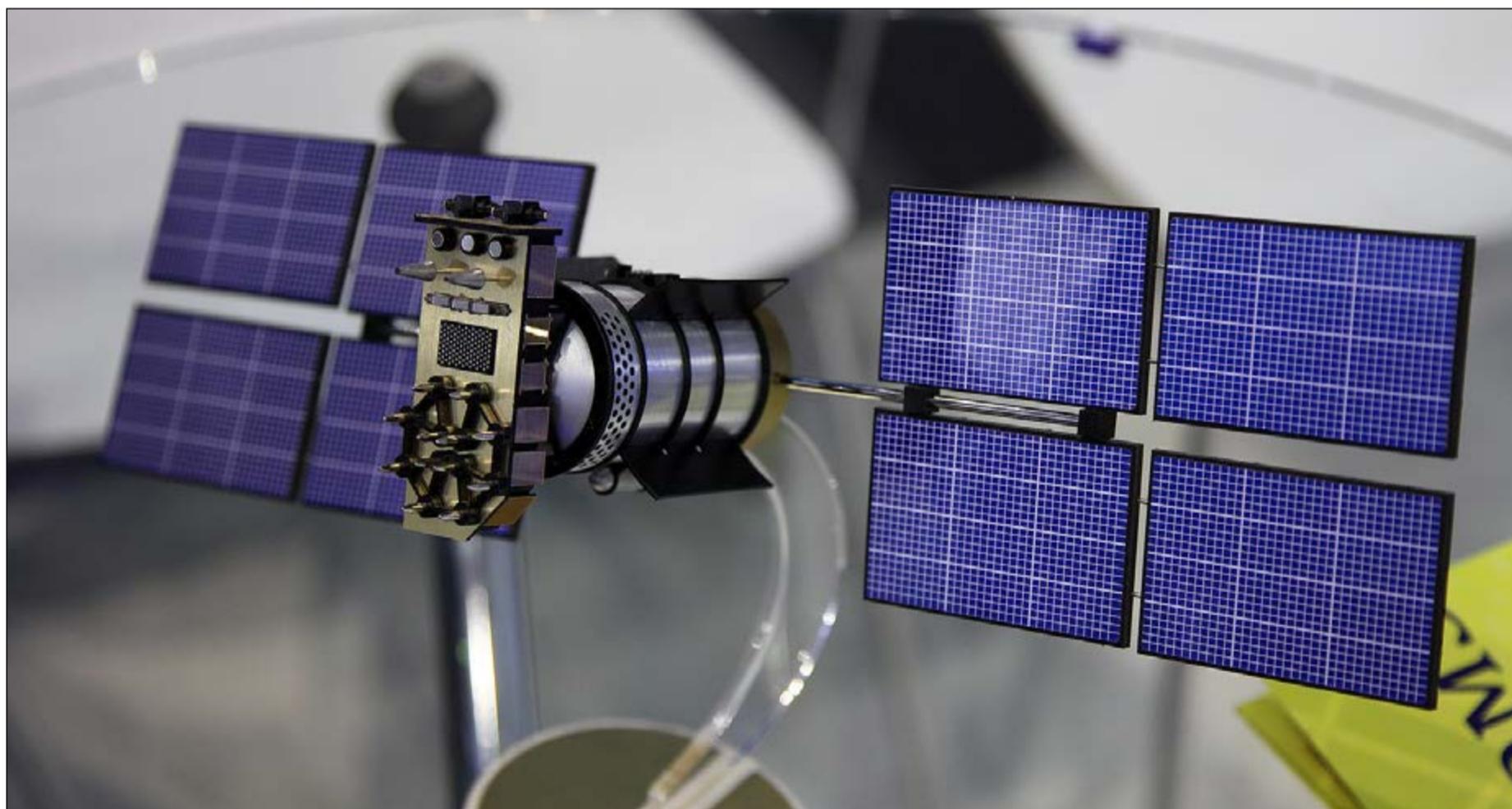


Russia Launches New GLONASS-K Satellite

OE Watch Commentary: According to multiple Russian and non-Russian open sources, Russia's GLONASS Global Navigation Satellite System employed its first satellites in 1982. Currently, the GLONASS constellation consists of 28 satellites, 24 of which are in service, with the other four as on-orbit spares, or are in servicing or testing. The 24 in-service satellites are situated in circular orbits at an altitude of 19,100 kilometers in three orbital planes of 8 satellites each. Of these 24 satellites, 23 are GLONASS-M variant (7-year service life), and only one is a newer-generation GLONASS-K (10-year service life). Although Russia still has older GLONASS-M satellites in ground storage, Russia plans to completely transition to the constellation GLONASS-K and GLONASS-K2 series satellites by 2025. Aside from a longer life span, the GLONASS-K reportedly has more power than the previous generation (1600 watts vs 1400 watts), and is unpressurized, thereby significantly reducing launch weight (1420 kg vs 990 kg) and therefore launch costs.

The accompanying excerpted article from *Krasnaya Zvezda* discusses the 25 October 2020 launch of a Soyuz-2, which put a third GLONASS-K satellite, Kosmos-2547, into orbit. Reportedly, Kosmos-2547 was launched into the second orbital plane, and will be placed between the constellation's 10th and 11th orbital positions. After 10-12 months of on-orbit testing, Kosmos-2547 is intended to replace the GLONASS-M satellite in the 10th position. According to the accompanying excerpted article from the *Ministry of Defense of the Russian Federation*, the first GLONASS-K prototype (Kosmos-2471) launched in 2011 and has only recently been "fully cleared for acceptance," despite the fact that the satellite is near the end of its service life. **End OE Watch Commentary (Bartles)**

“Today the main orbital grouping of our satellite navigational system consists of the “Glonass-M” satellites, which are demonstrating high reliability. The replacement of the orbital grouping with “Glonass-K” satellites, which were created for unpressurized operations and which have a guaranteed life-cycle that has been increased to 10 years.”



Model of a GLONASS-K, Vitaly Kuzmin.

Source: Vitali Kuzmin, <https://photos.smugmug.com/Military/MAKS-2015/i-tw4JprP/0/bdcc300d/X3/MAKS2015part8-13-X3.jpg> CC BY 4.0



Continued: Russia Launches New GLONASS-K Satellite

Source: “Программа летных испытаний КА «Глонасс-К» выполнена в полном объеме (Flight Test Program for ‘GLONASS-K’ Satellite Fully Completed),” *Ministry of Defense of the Russian Federation Online*, 10 October 2020. https://function.mil.ru/news_page/country/more.htm?id=12318613@egNews

The GLONASS-K satellite, which was inserted into orbit on 26 February 2011 by a Soyuz-2 space launch vehicle from the Plesetsk Cosmodrome, has successfully undergone flight testing. The flight test program was fully completed. All noted discrepancies have been eliminated. Following a decision of the State Commission, the GLONASS-K satellite will be accepted for regular operations...

Command and control and the ensuring of uninterrupted functions of the GLONASS orbital grouping is accomplished by combat crews of the GLONASS System Command and Control Center of the Main Space Testing Center imeni G.S. Titov of the Space Troops of the Aerospace Forces.

Source: “ГЛОНАСС пополнил новый спутник (GLONASS Augmented with New Satellite),” *Krasnaya Zvezda Online*, 28 October 2020. <http://redstar.ru/glonass-popolnil-novyy-sputnik/>

The launch of the space launch vehicle and the insertion of the satellite into the calculated orbit occurred normally. As early as within two minutes tracking of the “Soyuz-2” space launch vehicle was assumed by assets of the ground automated command and control complex of the Main Space Test Center imeni German Titov.

At the calculated time the “Glonass-K” satellite was inserted into the targeted orbit by the “Fregat” booster unit and control was accepted by ground assets of the Space Troops of the Aerospace Forces. Reliable telemetry communications were established and supported with the satellite. The on-board systems of the “Glonass-K” satellite are functioning normally.

The insertion of the satellite into orbit has augmented the orbital grouping of the GLONASS Global Navigation Satellite System. At the present time our orbital grouping numbers 28 satellites. Of these 24 are being used as designated, one is in orbital reserve, and one is undergoing flight testing. One more satellite is being temporarily withdrawn for technical servicing. And the newly launched “Glonass-K” is at the stage of being introduced into the system.

Today the main orbital grouping of our satellite navigational system consists of the “Glonass-M” satellites, which are demonstrating high reliability. The replacement of the orbital grouping with “Glonass-K” satellites, which were created for unpressurized operations and which have a guaranteed life-cycle that has been increased to 10 years of active existence in orbit with decreased energy requirements and significantly reduced weight, will ensure the stable operation of the GLONASS system and increase the accuracy of navigational positioning to tens of centimeters.

In contrast to its predecessors, the “Glonass-K” satellites will support two types of navigational signals, Frequency Division Multiple Access (FDMA) and Code Division Multiple Access (CDMA). Besides their main functions, they will forward information of the KOSPAS-SARSAT system providing international search and rescue services for those in distress.

Fangs of the Lone Wolf

Chechen Tactics in the Russian-Chechen Wars
1994-2009

Dodge Billingsley
with Lester Grau

Fangs of the Lone Wolf is about combat experience in urban, mountain and fairly open terrain. It is not a comprehensive history of conflict. This book is a series of snapshots — of vignettes — describing the difficulty, the hardship, the victories and the defeats of the participants. It is an examination of the raw data of combat in a foreign land, and is aimed to advance the professional military study of conflict.

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