

## Russia Hedges Bets on Satellite Navigation

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**OE Watch Commentary:** One common thread in Russian military thought about the U.S. military is the U.S. military's overreliance on technology, especially the use (or overuse) of GPS/satellite technology. Despite this criticism, Russia has made great efforts to complete its own satellite navigation system, known as GLONASS (Global'naya navigatsionnaya sputnikovaya sistema/Global Navigation Satellite System). Due to the development of GLONASS, Russia has seen little need to further support terrestrial-based navigation technologies such as the Long Distance Radio Navigation Station (RSDN) system.

As the accompanying article discusses, the Russian Federation has taken a new look at the feasibility of relying solely on satellite navigation technologies, and a decision point has been reached requiring Russia to look for other options, namely returning to the utilization of terrestrial-based navigation as the primary navigation system in combat operations. As the article points out, several nations have airborne counter-GPS technologies, and the Russian Federation Ground Forces have GP-jamming platoons in the electronic warfare companies of most maneuver brigades.

The Russian Federation's reassessment may have as much to do with Chinese, as with U.S. technology. The Chinese have made antisatellite technologies a high national priority, successfully destroying their own defunct weather satellite in 2007 with an airplane-launched missile. In May 2013 the Chinese launched a high altitude rocket from the Xichang Satellite Launch Center in western China, which demonstrated a possible capability to destroy a satellite with a ground-based rocket, as the rocket could be used in the future to carry an antisatellite



GLONASS RSDN-10 . Source: <http://ermakinfo.ru/narodnyie-izbranniki-predpolozhili-cto-olonass-budet-za-nimi-sledit/>

**Source:** Aleksey Krivoruchek, "Skorpion System to Replace GLONASS," Izvestiya Online, 6 August 2013, <http://izvestia.ru/news/554793#ixzz2bBRC0pRQ>, accessed 18 August 2013.

### Skorpion System to Replace GLONASS

#### Radio waves of new stations can seal Russia from the sky, sea, and land

The Ministry of Defense has begun to replace RSDN-10 [Long Distance Radio Navigation Station] ground-based long-range navigational radar systems with new Skorpion systems. In the event of war, these ground-based positioning systems will replace the space systems GPS and GLONASS [Global Navigation Satellite System]. The renewal program is calculated up to 2020 and started this year with three systems in the Transbaykal circuit.

"During combat activity all satellite signals coming through space will be actively suppressed with so-called 'white noise,'" Izvestiya was informed by Yuriy Kupin, spokesman for the Russian Institute of Radio Navigation and Time. "The armories of Russia, the USA, and a number of other countries have specially equipped aircraft which can block all near-Earth radio space with noise. The Skorpions are designed to be a kind of backup of GLONASS in such a situation."

The current long-range navigation systems were developed back in the 1940-50s and partially fulfilled the functions of a positioning system (with an error of 150-800 meters) which is now entrusted to GLONASS and GPS. Now, due to deterioration of the equipment and



GLONASS logo

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*payload on a similar trajectory. Whatever the reasoning, the Russian military leadership is veering away from satellite technologies for combat operations, and is likely interested in expanding their own GPS-jamming and antisatellite technologies. End OE Watch Commentary (Bartles)*

the difficulty of servicing it, the RSDN-10 is practically not used and most of the stations have been destroyed. The replacement of ground systems is conditioned firstly by the need to ensure national security in respect of radio-navigation.

Scientific developments of recent years were used in creating the new RSDN. The Skorpions are able to provide greater coverage (1,000 as against 600 km). In addition, the RSDN-10 does not have LKKS - the so-called local control and correction stations which are very remotely deployed, which prevents radio waves from penetrating the territory of a potential enemy and renders the radio-navigation invisible.

"Long-range aviation and the Navy are also the main 'consumers' of these stations, which are in service with the PVO [Air Defense] and VVS [Air Force]," Kupin said. "They receive exact time signals and synchronize equipment via such networks."

The Skorpions, unlike the obsolete stations, are able to automatically support the parameters of a radiated signal, can be managed from a single console, and can suppress residual radio pulses. The system's receivers can be installed on aviation, land, sea,

and river equipment. Another advantage of the Skorpions is the ability to synchronize stations with the GLONASS system, which greatly increases their effectiveness.

"Long-range aviation crews are never guided by the data of only one system when determining a location," Izvestiya was told by former Air Force commander Petr Deynekin. "We are always engaged in the comprehensive use of applications for determining the exact locations of aircraft. There should also be a stand-alone navigation system so the crew does not depend on radio and space applications which could be susceptible to interference. Incidentally, accuracy of navigation is one of the important problems of war and peace."

As well as adopting the latest radar developments, a modernization of old systems is also planned. Rosoboronpostavka [Federal Agency for Supplies of Armaments, Military and Specialized Hardware, and Materiel] has ordered repair and restoration work on RSDN-10 complexes and on the RSDN-20 Alfa system. The upgrade is being carried out in the framework of the "Global Navigation Systems" federal target program and in accordance with the Russian radio-navigation plan for 2008-15. About 50 million rubles has been allocated for these purposes from the Defense Ministry budget.

The commissioning of the Skorpion will take place in four stages. Three systems of the Transbaykal circuit will be replaced in 2013-15, four systems of the North Caucasus chain in 2016-17, four in the Far East in 2017-19, and three systems in the South Urals circuit in 2019-20. In addition to the new long-range navigation systems, the Russian army will take delivery of PPA DS/V jam-resistant aircraft receivers which work on GLONASS, GPS, the entire arsenal of ground-based RSDN, and Skorpion signals.



Scorpion. Source: [http://technicamolodezhi.ru/news/novosti\\_nauki\\_i\\_tehniki/GLONASS\\_V\\_MOZGU\\_U\\_NAS](http://technicamolodezhi.ru/news/novosti_nauki_i_tehniki/GLONASS_V_MOZGU_U_NAS)