Glonass Russian Technologies Methods of Use Of Era-Glonass in Ground Monitoring.

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ABSTRACT

With the development of our republic, suyuyol will use the system of the year and the requirements for monitoring agricultural production will increase. including glonass Russian technologies It is expedient to study and apply methods of using era-glonass on the earth monitor and apply in our region.

Keywords: Geodetic survey, "ERA-GLONASS", railway tracks, transport systems, Navigational radio signals, Earth deformation monitoring

The State Automated Information System (GAIS) "ERA-GLONASS" provides prompt receipt of information about traffic accidents on roads in the Russian Federation, its processing, storage and transmission to emergency operational services. The operator of GAIS "ERA-GLONASS" is JSC "GLONASS" (https://aoglonass.ru/).

In the event of an accident, the user terminal installed on the car determines the severity of the accident, the location of the affected vehicle via GLONASS and / or GPS satellites, establishes communication with the ERA-GLONASS infrastructure and transmits the necessary data about the accident through any mobile operator.

The call can be made manually using the special SOS button. At the same time, the operator of the ERA-GLONASS contact center clarifies the details of the incident and, in case of confirmation of the information or in the absence of a response, sends emergency response services - rescuers, ambulance, traffic police.

The Russian state emergency response system ERA-GLONASS is technologically compatible with the pan-European eCall system.

It is possible to provide additional services: tachograph functions, remote diagnostics of the vehicle condition, traffic management system, security search systems.

As part of the project, the infrastructure of the ERA-GLONASS system was deployed in the constituent entities of the Russian Federation, interfaced with systems-112 and emergency operational services, other state systems, a set of national technical standards was approved, the Federal Law "On the State

Automated Information System" ERA-GLONASS", which came into force on January 01, 2014.

In July 2013, the system was put into trial operation in 15 regions of Russia. On January 1, 2015, the system was put into commercial operation. The first production car equipped with the ERA-GLONASS system was the Russian car Lada Vesta.

Since 2018, the subscriber terminals of the system have been installed on all vehicles sold in Russia.

The introduction of the ERA-GLONASS system led to a reduction in response time in case of accidents and other emergencies, which made it possible to reduce the level of death and injury on the roads and improve the safety of freight and passenger traffic.

Application of GLONASS POSITIONING Services based on location data

 Targeted advertising

 Spatially oriented access to information resources

 Geospatial Information Systems

 Comprehensive information about the environment

Monitoring

 Monitor the location of people, animals and property

 Coordination of emergency crews

 Monitoring the movement of high-value goods

 Operational monitoring of the state of railways

Geodesy and cartography

 Geodetic survey

 Cadastral work, land surveying

 Engineering and construction support

 Updating maps and plans

Construction

 Automated control of construction equipment

 Road construction works

 Laying communications, pipelines, etc.

 Construction and repair of railway tracks

NAVIGATION

Leisure and recreation

 Hiking

 Fishing, hunting

 Boating

 Travel itinerary

 Personal emergency beacons

Ground transport

 Autonomous building of traffic routes

 Intelligent transport systems

 Operational monitoring of the state of railways

Agriculture

 Planting, watering and harvesting optimization

 Increasing the efficiency of pollination of crops

 Maintenance of agricultural machinery

Aviation

 Entry and landing by ICAO categories

 Route navigation

 Increasing the safety of helicopter piloting

 Navigation drones

Space

 Launch vehicle tracking

 High-precision determination of spacecraft orbits

 Determining the orientation of the spacecraft relative to the Sun

Water transport

 Approach and maneuvering in ports, on inland waterways

 Navigation on inland waterways

 Fleet monitoring and accounting

RESEARCH AND SYNCHRONIZATION

Environment

 Earth deformation monitoring

 Monitoring the parameters of the Earth's rotation

 Monitoring the composition and state of the troposphere and ionosphere

 Monitoring of water and forest resources

 Mining

Communication and synchronization

 Synchronization of power lines

 Synchronization of communications and telecommunications

 Time synchronization of spaced consumers

 Coordinated Universal Time (UTC)

GLONASS system services

The GLONASS system provides the consumer with two types of services - standard and high accuracy.

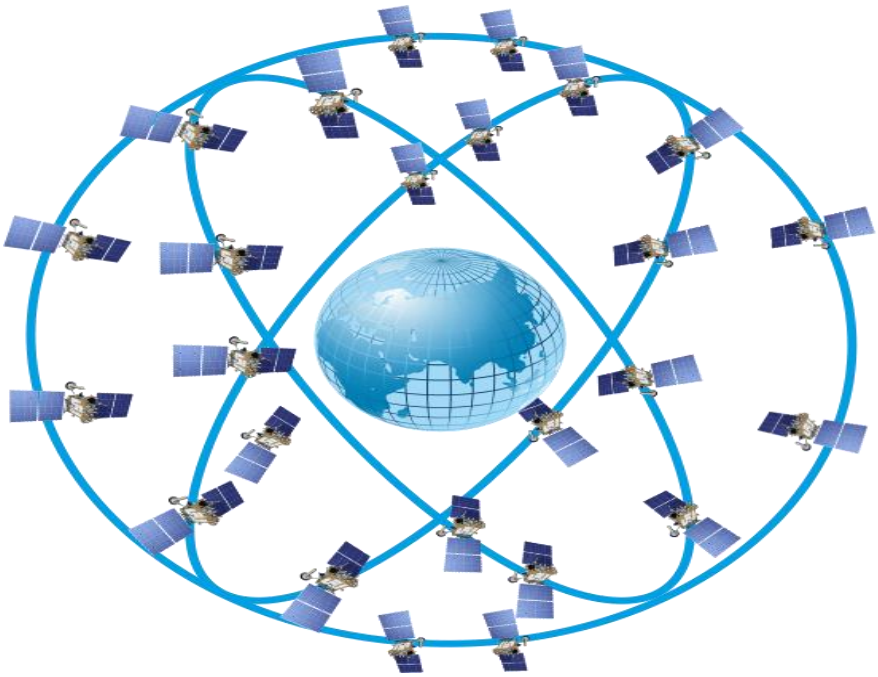
Standard precision services are provided to customers through the transmission of standard precision signals in the L-band. Each GLONASS-M spacecraft transmits navigation radio signals with frequency division in two bands: L1 (1.6 GHz) and L2 (1.25 GHz).

Standard precision signal clocked at 0.511

MHz, intended for use by domestic and foreign civilian consumers, is available to all consumers equipped with the appropriate AP, in the visibility zone of which there are satellites of the GLONASS system.

Satellite Constellation

The standard GLONASS orbital constellation consists of 24 satellites located in medium-altitude near-circular orbits with nominal altitudes of 19100 km, inclination of 64.8° and period of 11 h 15 min 44 s. The value of the period made it possible to create a stable orbital system, which, unlike GPS orbits, does not require corrective impulses to maintain it practically during the entire period of active existence. The nominal inclination ensures 100% availability of navigation on the territory of the Russian Federation, even if several spacecraft leave the orbital constellation.



Orbital Group	
Number Of Regular Sc	24
Orbit Altitude	19 100 км

Number Of Planes	3
Big Axle	25 420 км
Period	11 ч 15 мин 44 с
Mood	64,8°

Current state of OG GLONASS

Spacecraft types

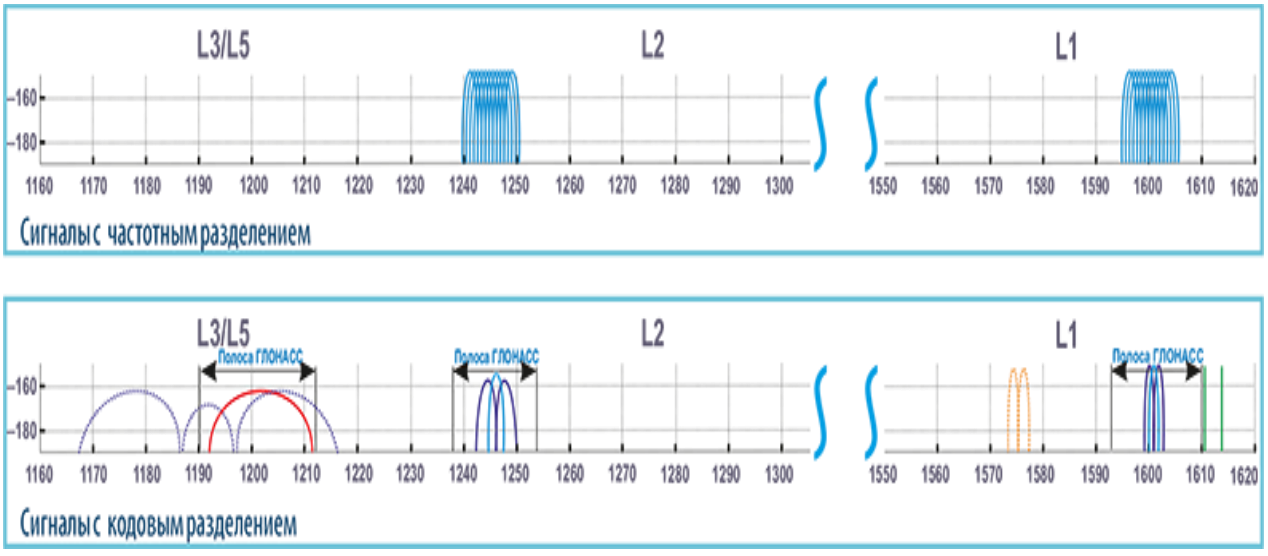
Navigation radio signals

At the design stage for the GLONASS system, a frequency method was adopted for separating the signals of various spacecraft: each of them uses its own pair of carrier frequencies, one of which belongs to the L1 range, the other to the L2 range.

For spacecraft that are diametrically opposite points of the orbit, the same letter frequencies are used, 12 in each frequency range.

Launched into orbit in 2011 for flight tests, the spacecraft of the GLONASS-K modification of the 1st stage, along with L1 and L2 radio signals with frequency division, completely similar to the GLONASS-M signals, additionally emits open access radio signals with coded separation. Upgraded devices "Glonass-M" No. 55-61 also emit a navigational radio signal with a code division in the L3 band.

The spectrum of navigation radio signals of the GLONASS system



Time system: As the system time scale of the GLONASS system, a conditional continuous time scale is adopted, which is formed on the basis of the time scale of the Central Synchronizer of the system. The central synchronizer is equipped with hydrogen frequency standards.

The reference time scale for the GLONASS system is the national coordinated time scale of Russia UTC(SU). The discrepancy between the

GLONASS system time scale and UTC(SU) must not exceed 1 ms.

The GLONASS system time scale is corrected simultaneously with the planned correction by an integer number of seconds of the UTC coordinated universal time scale.

Conclusion. Land monitoring and the development of digital data production systems are important in all areas. The development of a satellite system involves the involvement of qualified specialists, the provision of assistance by political organizations, and in addition, the improvement of geodetic topographic work, the study and evaluation of agricultural land.

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