

# FEDERAL SPACE AGENCY (ROSCOSMOS)



## Status of the GLONASS System and Prospects of its Development and Utilization

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Bengaluru Space Expo 2010  
Bangalore, 25 August 2010

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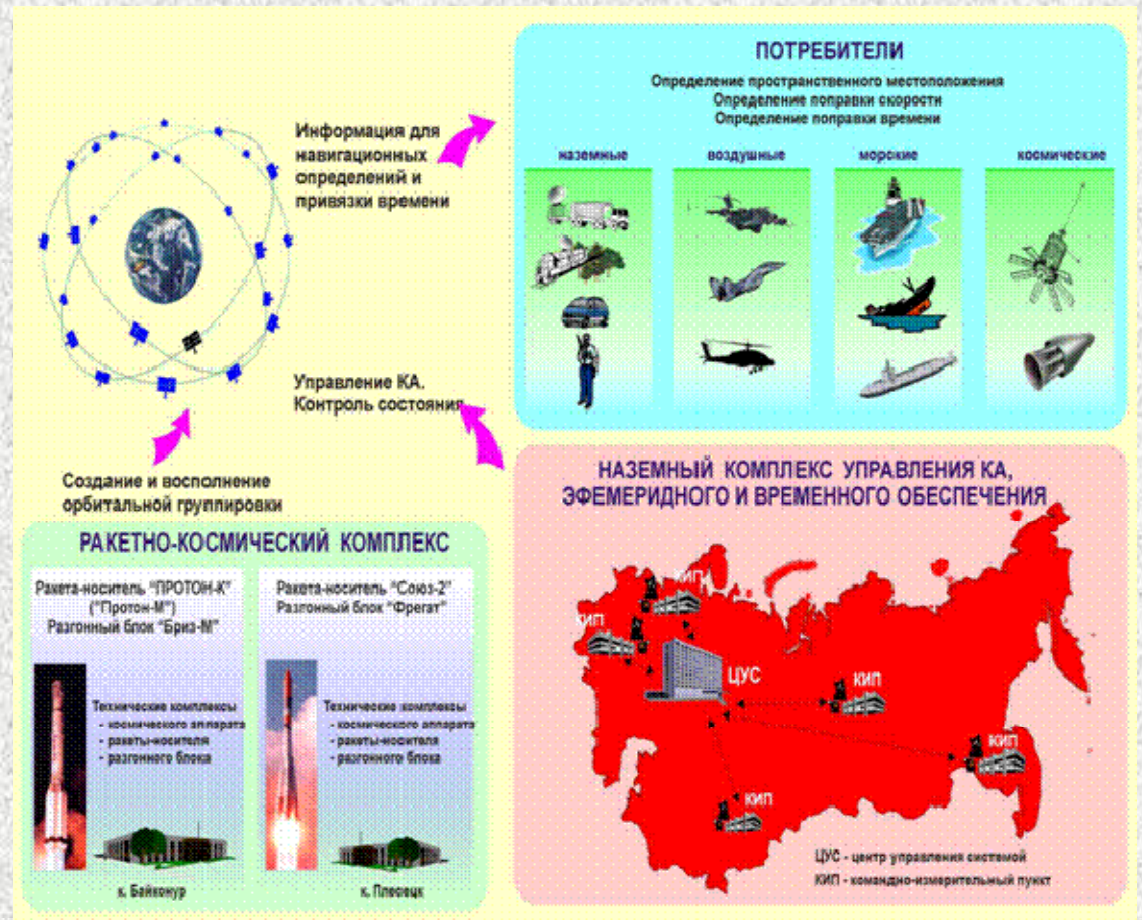
# GLONASS Space Complex Architecture

## ➤ Orbit constellation:

- ❑ 24 satellites, 3 planes by 8 satellites
- ❑ Orbit shift by  $120^\circ$  along the equator

## ➤ Orbit parameters:

- ❑ orbit – circular
- ❑ height 19100 km
- ❑ inclination  $64.8^\circ$
- ❑ revolution 11h15min

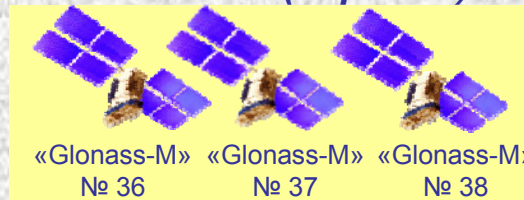




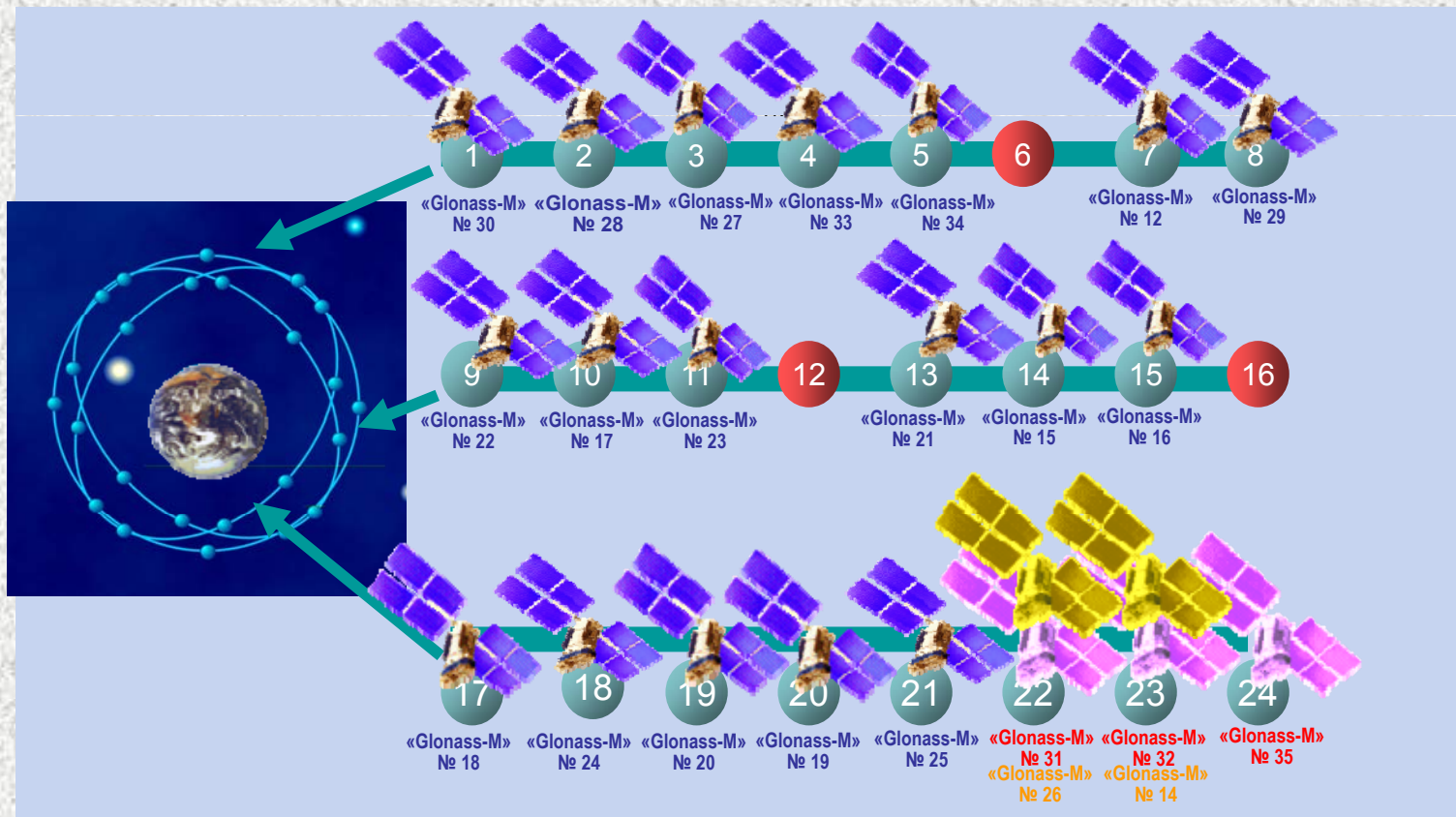
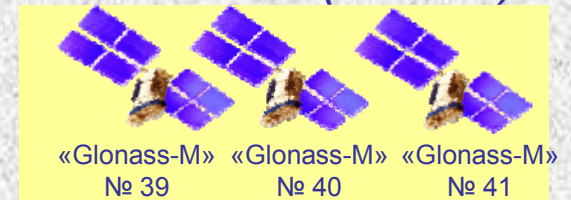
# Current GLONASS Constellation Status

In Orbit: 23  
Healthy: 21  
In Reserve: 2

*Block 42 (Sep 2010)*

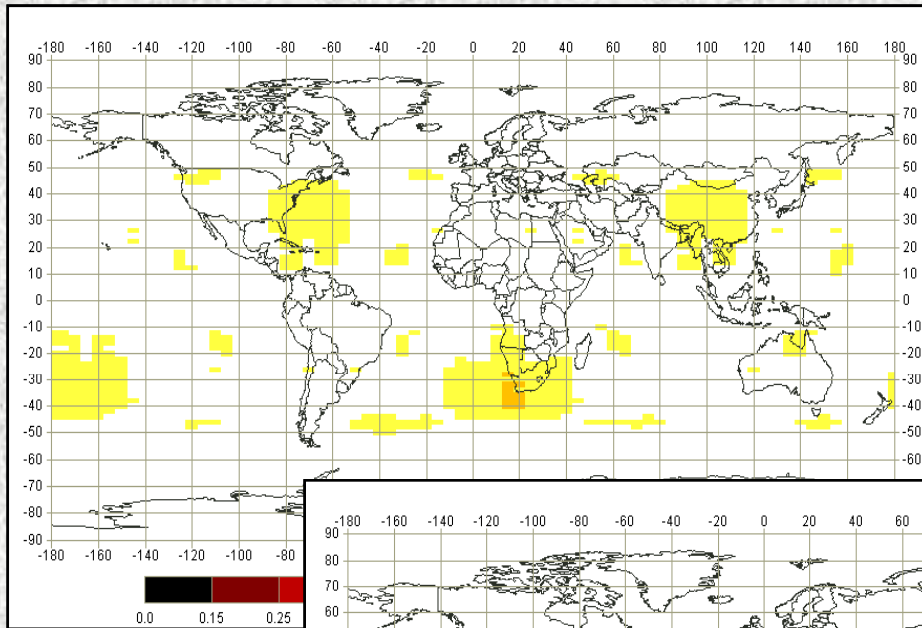


*Block 43 (Nov 2010)*

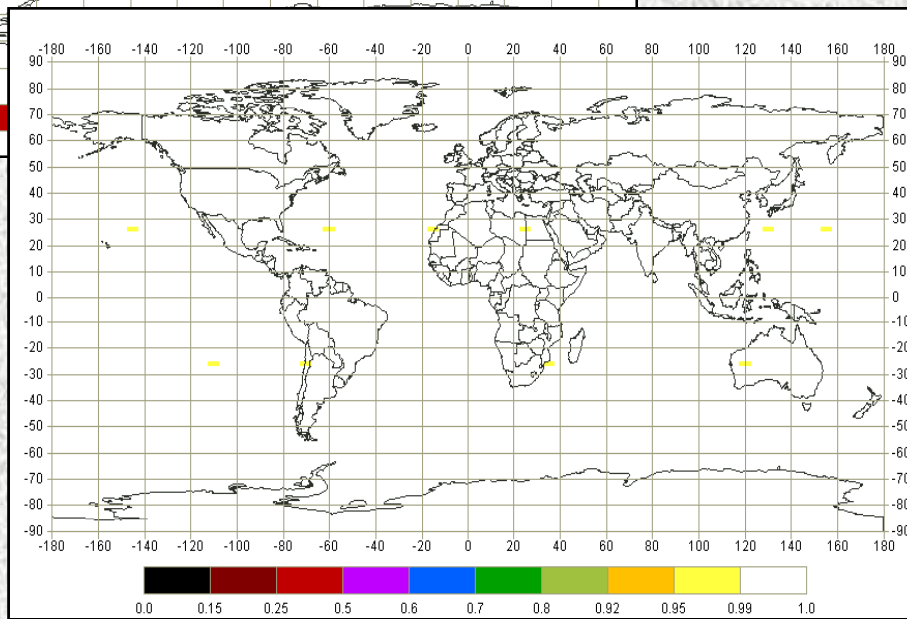




# GLONASS Deployment Program



**August, 2010**  
**21 satellites**  
**98 % global availability**



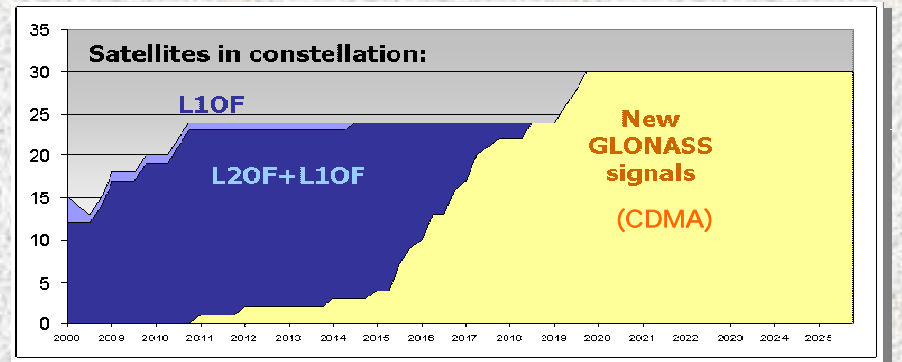
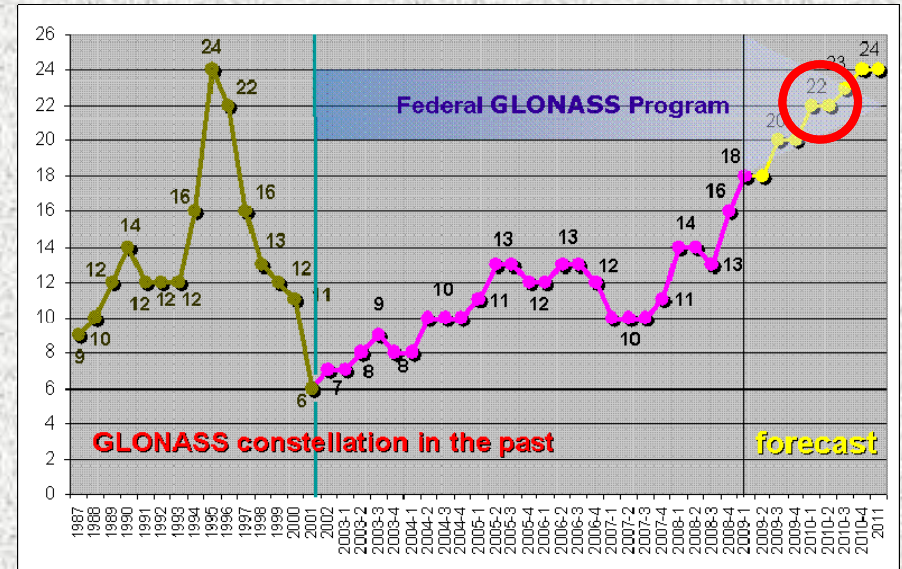
**December, 2010**  
**24 satellites**  
**100 % global availability**



# GLONASS Strategy Planning

- Full constellation deployment in 2010
- Ground Control Segment modernization
- New «Glonass-K» satellite (with improved performance) IOV start by 2010
- GLONASS will continue transmitting existing FDMA signals
- Additional new CDMA signals since «Glonass-K» deployment
- GLONASS performance competitive ability provision plan
- GLONASS Federal Program extension until 2020

Number of operational satellites



**GLONASS-K Flight Tests**
**Constellation Update based on GLONASS-K**



# State Policy Basic Principles

- **GLONASS is a part of the critical state PNT infrastructure providing national security and economy development**
- **Creating, developing and sustaining the PNT infrastructure is a Governmental responsibility**
- **No direct user fees for civil GLONASS services**
- **Open, free access to GLONASS information necessary to develop and build user equipment**
- **GLONASS is used in combination with other GNSS, terrestrial radio navigation, other navigation means to increase reliability of navigation**
- **International cooperation on GNSS compatibility and interoperability**



**Federal GLONASS Program is a basis for GLONASS sustainment, development and use**



## Summary

- **GLONASS Program is the high priority of the Russian Government policy**
- **The Russian Federation President Decree (№638 on 17 May 2007) declares:**

***The Government of the Russian Federation until 31 December 2011 must approve the GLONASS Program for maintaining, developing and utilizing the system in 2012-2020***

- **The main priority of GLONASS development is:**
  - Full constellation (24 sats) by the end of 2010**
  - New signals implementation to improve the service for both military and civil users**

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**Thank you!**

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