



ICG International Committee on
Global Navigation Satellite Systems

A forum to discuss Global Navigation Satellite Systems (GNSS)
to benefit people around the world

The International Committee on Global Navigation Satellite Systems (ICG)

The United Nations General Assembly in its resolution 61/111 of 14 December 2006, noted with appreciation that the International Committee on Global Navigation Satellite Systems had been established on a voluntary basis as an informal body to promote cooperation, as appropriate, on matters of mutual interest related to civilian satellite-based positioning, navigation, timing and value-added services, as well as the compatibility and interoperability of global navigation satellite systems, while increasing their use to support sustainable development, particularly in developing countries.

ICG Membership

ICG participation is open to all countries and entities who are either GNSS providers or users of GNSS services, and are interested and willing to actively engage in ICG activities.

Providers Forum

Within the ICG is the Providers Forum, consisting of those countries operating GNSS systems or with plans to develop one. The Forum provides a venue for coordination and cooperation to improve overall service provision.

The ICG Work Plan

The ICG workplan covers key issues, including:

- Compatibility and interoperability;
- Enhancement of performance of GNSS services;
- Information dissemination;
- Interaction with international organizations, national and regional authorities;
- Coordination among service providers.

The ICG conducts full meetings, annually hosted by different members and subgroup meetings as necessary.



Current and Planned System Providers

The United States: Global Positioning System (GPS)

GPS is a United States space-based radio-navigation system that provides reliable positioning, navigation, and timing services to users on a continuous worldwide basis—freely available to all. The outstanding performance of GPS over many years has earned the enduring confidence of millions of international users. With its ongoing modernization programme, GPS will continue to provide superb quality and performance in the future.

The Russian Federation: GLOBAL NAVIGATION Satellite System (GLONASS)

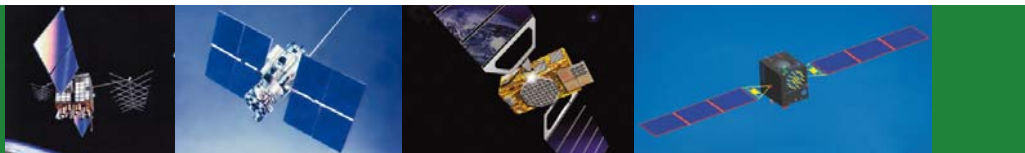
The Russian navigation satellite system, GLONASS, is based on a constellation of active satellites which continuously transmit coded signals in two frequency bands, which can be received by users anywhere on the Earth's surface to identify their position and velocity in real time based on ranging measurements. In the future a third frequency for GLONASS signal transmission will be introduced. In some areas of application, the use of combined GPS, GLONASS and Galileo constellation appears to be preferable option.

The European Community: European Satellite Navigation System (GALILEO)

GALILEO, an initiative launched by the European Commission and the European Space Agency, will be a global navigation satellite system, owned by the European Community, providing highly accurate, guaranteed global positioning services under civilian control. The Galileo Open Services signal will be interoperable with the GPS civil signal, as well as with GLONASS.

China: COMPASS/BeiDou

The existing three-satellite COMPASS/BeiDou navigation system has played an important role in offering efficient positioning, timing, communication services and differential GPS information in surveying, telecommunications, transportation, meteorology, forest fire prevention, disaster forecast and public security areas. On the basis of the COMPASS/BeiDou Navigation Test System, China has started to build a system with global coverage.



Technical Parameters

	Nominal constellation	Full operational capability	Number of operational satellites	Coverage	Civilian spectrum
GPS	24	1995	29 (August 2007)	Global	Current: L1 C/A, L2C Future: L1 C/A, L1C, L2C, L5
WAAS	2	IOC/2003 FOC/2008	2	Regional (North America)	Current: L1C/A, L5 Future: L1C/A, L1C, L5
GLONASS	24	1995 (GLONASS) 2010 (GLONASS-M)	11 (August 2007)	Global	Current: L1PT, L2PT Future: L1PT, L2PT, L3PT*, L1CR**, L5R** * signal structure is under refinement ** pending final decision
SDCM	2			Wide area (Russia)	SBAS L1 C/A
EGNOS/ GALILEO	3 (GEOs) 30 (MEOs)	2008 (regional) 2012 (worldwide)	3 GEOs 1 MEOs	Global	E5 OS/Sol E6 CS, E6 PRS E1 OS/Sol
COMPASS/ BeiDou	5 + 30	2007	5 (August 2007)	Global	1195.14 ~ 1219.14 MHz 1256.52 ~ 1280.52 MHz 1559.05 ~ 1563.15 MHz 1587.69 ~ 1591.79 MHz
GAGAN/ IRNSS	3/7	2010/2012	3/7	Regional	GAGAN: L5, L1 IRNSS: S, L5 and L1
MSAS	2 GEOs		2 GEOs (MTSATs)	Asia, Pacific	L1
QZSS	1 (1 st step) 3 (2 nd step) ¹		1 (FY 2009 target)	Regional (Asia/Oceania)	L1 C/A, L1C, L2C, L5, L1-SAIF (L1-submeter-class augmentation with integrity function), LEX (L-Band Experimental Signal)
NigComsat -1 SBAS	1+	2008	1	Global	L1, L5

¹ The QZSS plan will basically proceed to the 2nd stage of government-private cooperation, after the evaluation of the results of technological verifications and demonstrations of the 1st stage.

Current and Planned Augmentation System Providers

WAAS

The Wide Area Augmentation System (WAAS) augments GPS over the North American territory to provide the additional accuracy, integrity, and availability needed to enable users to rely on GPS for safety-critical applications, particularly in the field of aviation.

SDCM

The Russian system of differential correction and monitoring (SDCM) is intended for development and real-time transfer of the adjusting information for GLONASS, GPS and GALILEO systems (integrity data, wide-area and local correction data) to civilian customers. It is expected that SDCM based on GLONASS/GPS signals will provide increased (in comparison with basic level) accuracy of position determination in real time at any point in the Russian Federation.

EGNOS

The European Geostationary Navigation Overlay Service (EGNOS) is a Satellite-based Augmentation System (SBAS) providing service for safety critical applications in Europe. As a first element of European GNSS capabilities, EGNOS will be integrated in the GALILEO programme.

GAGAN/IRNSS

GPS Aided Geo Augmented Navigation (GAGAN) has been taken up with an objective to demonstrate the Satellite-based Augmentation System (SBAS) technology over the Indian region. It is planned to be an operational system to provide a seamless navigation facility in the region, which is interoperable with other SBASs. Although primarily meant for civil aviation, it is beneficial for other users.

MSAS/QZSS

The Multi-functional Transport Satellite (MTSAT) is one of the SBASs (Satellite-based Augmentation System) compliant with ICAO SARPs. This system provides navigation



services for all the aircraft within Japanese airspace via two geostationary satellites (MTSAT-1R and MTSAT-2). Quasi-Zenith Satellite System (QZSS), promoted by Japan, is the Asian and Oceanian regional system that will serve as enhancement for GPS. QZSS was designed so as to guarantee that at any time at least one of its three satellites is close to the zenith over Japan.

NIGCOMSAT-1 SBAS

With its Nigerian Communications Satellite (NIGCOMSAT-1), Nigeria is the first African country planning to enter the field of GNSS.

ICG Meetings

In November 2006, in the first meeting of the ICG, the representatives of the State Members of the United Nations, international organizations, and entities met in Vienna (Austria) to discuss matters relating to GNSS and their applications. Those applications included safety and economic development, particularly the efficiency and safety of transport, search and rescue, land management and sustainable development, and other activities.

In September 2007, the second meeting of the ICG, in Bangalore (India) a Providers Forum was established with the aim to enhance compatibility and interoperability among current and future system providers, as a mechanism to continue discussions on important issues addressed by the ICG that require focused inputs from system providers. Members of the Providers Forum, including China, the European Community, India, Japan, the Russian Federation and the United States, addressed key technical issues and operational concepts such as compatibility and interoperability, the protection of GNSS spectrum, orbital debris/orbit de-confliction and other matters related to the work of the ICG.

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