

Overview of Compass/BeiDou Navigation Satellite System (CNSS)

China Satellite Navigation Project Center

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Brief introduction of CNS

The space segment of CNSS consists of 5 geostationary earth orbit (GEO) and 30 medium earth orbit (MEO) satellites. The carrier frequency of CNSS is 1195.14~1219.14MHz, 1256.52~1280.52MHz, 1559.05~1563.15MHz and 1587.69~1591.79MHz.

Two kinds of service will be provided. One is the Open Service, which is designed to provide users with positioning accuracy within 10 meters, velocity accuracy within 0.2 meter per second and timing accuracy within 50 nanoseconds. The other is the Authorized Service, which will offer "safer" positioning, velocity, timing, communication services and integrity information for authorized users.

China has sent three satellites into geostationary orbit (80° E (east longitude eighty degree), 140° E, 110.5° E) since 2000, and then Compass/BeiDou Navigation Test System has been established. the fourth experimental satellite was launched on Feb 2007 and brought into use on 26th March 2007.

On the basis of Compass/BeiDou Navigation Test System, China has started to build CNSS. The first satellite of CNSS which is a medium earth orbit (MEO) was launched on Apr 2007, and is under In Orbit Validation at present. Thereinto, in the precise orbit determination test of the single satellite, the residual error of orbit determination is 0.5 meter. The maximum error of orbit overlay arc is less than 10 meters and the radial accuracy using laser check is less than 1 meter.

The test results show that Compass/BeiDou satellite, monitor station and software processing is completely normal. The system has been implemented in arranged time and then will be developed into a global constellation step by step.

CSN (China Satellite Navigation Project Center) takes charge of the research, building and management of CNSS.

In order to promote the compatibility and interoperability between the Compass/BeiDou Navigation Satellite System and other GNSS systems, to improve the application of positioning, navigation and timing services, China is willing to cooperate with other countries to develop the satellite navigation industry together.

Guiding Principles of CNSS

The construction and development of the Compass/BeiDou navigation satellite system is on deep investigation of the world satellite navigation development situation and the characteristics of navigation technology development. In combination with the BeiDou satellite navigation progress, we always insist on the principle of seeking truth from facts, comprehensive balance, being pragmatic and innovative.

On all taches such as requirement investigation, index determination, project design, system construction and operation management, we shall firmly focus on the application expansion and industry development, not only to complete the building of the system, but rather to assure making full use of the system.

1. Openness

Firstly, openness means that the BeiDou Navigation Satellite System will provide public free services with high quality for users all over the world, and we welcome users from all nations to use the BeiDou navigation system. Secondly, the BeiDou Navigation Satellite System will absorb the advanced experiences of satellite navigation technology development of other countries, and take the responsibility to develop the world satellite navigation industry.

thirdly, the establishment, development and application expansion of the BeiDou Navigation Satellite System will be open to all units and individuals with power in and aboard our country, and we welcome people of all communities to contribute to the development of the BeiDou navigation system. Finally, the BeiDou Navigation Satellite System will communicate and cooperate with main Navigation Satellite Systems in the world, promoting the world satellite navigation technology development and advance.

2. Independency

According to the statistics, in modern information society, 85% of the information has the property of location, velocity and time. So Navigation Satellite System that provides this sort of property has become the necessary infrastructure of the information society development, and has become the core and base of information industry development. So, the establishing and developing of Navigation Satellite System, which can not depend on any other systems, must keep independence.

Firstly, independence means that BeiDou Navigation Satellite System can provide basic services for users in the world, and high-level services and high-quality value-added services in the Asia-Pacific area. Secondly, BeiDou Navigation Satellite System will be independently constructed, operated and developed to avoid the loss of National Interest and user benefit.

3. Compatibility

Compatibility is that BeiDou Navigation Satellite System is compatible and interoperability with other primary Navigation Satellite Systems in the world. Firstly, this is the consultation requirement of International Committee on GNSS under U.N. framework, and is the essential precondition to insure normal operation of world navigation system without mutual interference.

Secondly, it is the necessary request of favorable transition from current China satellite navigation industry with GPS as the core, and the concerned promises that can protect the existing user benefit . Thirdly, compatibility can ensure that BeiDou Navigation Satellite System shares the achievement of the development of Global Satellite Navigation if users safely use BeiDou. Lastly, compatibility is also the important embodiment of responsibility borne by China to accelerate the development of Global Satellite Navigation Industry, and the important step of blending into World Order.

4. Gradualness

Qua a large complex space system which can directly provide long-term services to society, the construction and development of Navigation Satellite System is a continuous and gradual process. According to the lessons learned from the development of Global Navigation Satellite System, BeiDou Navigation Satellite System will be constructed and developed based on the fact of national technology and economy, under the condition of strict control of technical and economic risks, according to the progressive principle.

Moreover, BeiDou Navigation Satellite System promises that various measures will be taken to provide long-term continuous services for users, and system performance will be incessantly improved to enhance the ability to provide services for users with the development of technology.

THANK YOU!