## Alleged North Korea GPS jamming disrupts flights and ships in South Korea

South Korea's military has reported that North Korea disrupted GPS signals from border areas for the fifth consecutive day, impacting numerous civilian flights and maritime vessels. This interference originated from the western border cities of Kaesong and Haeju, North Korea.

According to *NBC News*, the GPS jamming affected the West Sea (Yellow Sea) area. While the exact number of affected flights and vessels was not specified, the disruption was significant enough to prompt warnings from South Korea's Joint Chiefs of Staff (JCS) to aircraft and ships operating near the western border.

Read more in *GPS World* article. https://www.gpsworld.com/alleged-north-korea-gps-jamming-disrupts-flights-and-ships-in-south-korea-for-second-day/?utm_source=Navigate%21+Weekly+News&utm_medium=Newsletter&utm_campaign=NCMCD241106004&oly_enc_id=1784A2382467C6V

2024-11-12

## BeiDou Navigation Satellite System in 2024

Upholding the principles of "*superior construction, excellent management, and substantial development*," the BeiDou Navigation Satellite System (BDS) implements multifaceted strategies to ensure uninterrupted and stable system operations and services, with its backup satellites launched into orbit as per the scheduled plan in 2024. Concurrently, research on next-generation BDS technology upgrades and related technological trials for integration with low-Earth orbit (LEO) positioning, navigation and timing (PNT) systems are vigorously promoted, further enhancing international collaboration and propelling the continuous advancement of BDS in the new era.

BDS currently consists of 45 operational satellites in orbit, delivering services through 15 BDS-2 and 30 BDS-3 satellites. Since May 2023, five BDS-3 backup satellites have been launched to bolster system resilience.

Read more in *GPS World* article. https://www.gpsworld.com/beidou-navigation-satellite-system-in-2024/?utm_source=Navigate%21+Weekly+News&utm_medium=Newsletter&utm_campaign=NCMCD241113002&oly_enc_id=1784A2382467C6V

2024-11-15

**Google used millions of Android phones to map the worst enemy of GPS**

In a paper published this week in *Nature*, Google researchers demonstrated they were able to use GPS signal measurements pulled from millions of anonymous Android mobile devices to map the ionosphere. Though a signal from any single mobile device is too “noisy” to tell researchers much about the ionosphere, that noise gets corrected when there are many other devices to compare against. In the end, the researchers were able to use the vast web of Android phones to map out the ionosphere with a level of accuracy that matches monitoring stations. In areas like India and Central Africa, the Android technique actually far surpassed the accuracy of monitoring stations alone.

Scientists around the world can measure this ionospheric traffic (officially called total electron content (TEC) through a network of high-quality ground-based monitoring stations. These detection tools are effective but they are also relatively expensive to build and maintain, which makes them less common in developing regions of the world. That unequal access to monitoring stations leads to disparities in the global ionospheric mapping accuracy. Researchers from Google tried to address this mismatch by leaning on something already owned by a majority of the world’s population: mobile phones.

Read more in *article*…

https://www.popsci.com/technology/google-gps-map/

2024-11-14

Europe moving toward a “timing backbone” and looking for input

Citing a need for better “positioning, navigation and timing (PNT) resilience, availability and continuity,” a market consultation document from the EU’s Joint Research Center (JRC) says establishing a resilient PNT ecosystem is essential for “…EU autonomy, the economy’s overall resilience and EU global standing.” Therefore, creating this system-of-system ecosystem “… should be considered a critical priority for the EU.”

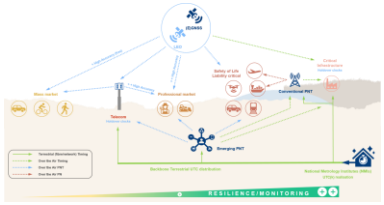
Such an approach to PNT and resilience is a major feature of the 2023 European Radio Navigation Plan.

According to the JRC, complementary (or continuous) PNT, or C-PNT, is the combination of existing space assets (GNSS) and future services that can work together in the multi-system ecosystem. This extends the service to areas where GNSS is not available and increases overall resilience.

The JRC document goes on to say, “The first step towards the creation of such a C-PNT ecosystem is the deployment of the terrestrial timing backbone.”

Read more in *GPS World* article. https://www.gpsworld.com/europe-moving-toward-a-timing-backbone-and-looking-for-input/?utm_source=Defense+PNT&utm_medium=Newsletter&utm_campaign=NCMCD241107003&oly_enc_id=1784A2382467C6V

2024-11-13



## Xona Space Systems and QASCOM Partner for Resilient PNT

Xona Space Systems has announced that they have partnered with QASCOM, an Italian-based company in the Space & Defence sector. The integration of Xona PULSAR into QASCOM's GNSS Software-Defined Radio (SDR), the QN400-P, is designed to strengthen PNT resiliency in the face of persistent threats.

This will deliver enhanced security, jamming/spoofing resistance, and next-gen accuracy for industries ranging from drone navigation to defence.

The need for more robust, secure and precise navigation continues to grow across industries like agriculture, construction, and autonomy. The Xona and QASCOM technology integration aims to provide solutions for these industries as well as other application areas and use cases.

Read more in *Inside GNSS* article. https://insidegnss.com/xona-space-systems-and-qascom-partner-for-resilient-pnt/

2024-11-08

## NaviMoon New Earth-Moon GNSS Spaceborne Receiver

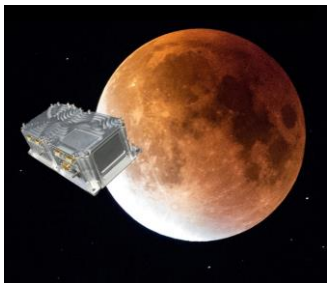
Partners SpacePNT and European Engineering and Consultancy (EECL) have delivered the final presentation of the European Space Agency (ESA)-funded 'Earth Moon GNSS Spaceborne Receiver For In-Orbit Demonstration' project, the aim of which was to develop and qualify a GNSS spaceborne receiver called NaviMoon for lunar applications.

Current geostationary orbit (GEO) and geostationary transfer orbit (GTO) missions already exploit GNSS signals for in-orbit positioning, navigation and timing (PNT). NASA's Magnetospheric Multiscale (MMS) mission has demonstrated that tracking of GPS signals is possible up to 150,000 km from the Earth's surface, that is half the distance to the Moon.

The feasibility of extending the use of GNSS for lunar missions has been assessed by ESA in studies under the agency's General Studies Program (GSP). These studies have shown that navigation to the Moon using GNSS might be feasible if specific high-sensitivity techniques were implemented in GNSS spaceborne receivers.

Read more in *Inside GNSS* article. https://insidegnss.com/navimoon-new-earth-moon-gnss-spaceborne-receiver/

2024-11-12



**GPS chaos in the Baltic Sea: Finnish coast guard on alarm**

The Finnish Coast Guard is warning of serious disruptions to GPS signals in the Baltic Sea. These are said to have been taking place since April. The interference leads to dangerous situations at sea, with ships going off course and almost ending up on islands or in shallow water. The recent discovery that oil tankers are deliberately falsifying their location data to disguise visits to Russian ports is equally problematic, possibly to circumvent sanctions. These developments compromise maritime security and threaten the fragile Baltic Sea ecosystem.

Read more in *article*…

https://innovationorigins.com/en/gps-chaos-in-the-baltic-sea-finnish-coast-guard-on-alarm/

2024-11-02

## Royal Navy demonstrates quantum-sensing technology for alternative PNT

The Royal Navy has successfully tested a new quantum sensing technology designed for underwater detection. Conducted off the coast of Plymouth aboard HMS Magpie, the trials aimed to evaluate the effectiveness of this quantum-sensing system in identifying submerged objects.

The technology leverages ultra-cold atoms to measure subtle variations in the Earth's magnetic field, which indicate underwater objects. This method allows for the detection of items that traditional sonar systems might miss, enhancing the precision of underwater surveys.

During the tests, the system identified various targets, including a concrete block weighing one ton, and demonstrated sensitivity sufficient enough to detect objects as small as a soccer ball.

Read more in *GPS World* article. https://www.gpsworld.com/royal-navy-demonstrates-quantum-sensing-technology-for-alternative-pnt/?utm_source=Navigate%21+Weekly+News&utm_medium=Newsletter&utm_campaign=NCMCD241030002&oly_enc_id=1784A2382467C6V

2024-11-05

## JAXA selects ArkEdge to study LEO PNT system

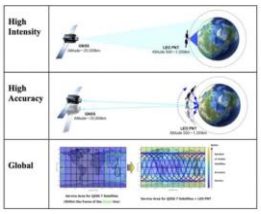
The Japan Aerospace Exploration Agency (JAXA) has awarded Japanese startup ArkEdge Space a contract to study the feasibility of establishing a constellation of position, navigation and timing (PNT) satellites in low-Earth orbit. The project aims to provide high-precision PNT signals across the globe.

Government agencies worldwide are exploring ways to complement and back up GNSS, which is susceptible to natural and deliberate interference. In addition, self-driving cars and autonomous drones require extremely precise location data.

Under the new JAXA contract, ArkEdge Space will provide a conceptual design for a LEO-PNT satellite and its orbit. ArkEdge will also explore satellite and constellation tradeoffs and consider different signal formats and frequency bands.

Read more in *GPS World* article. https://www.gpsworld.com/jaxa-selects-arkedge-to-study-leo-pnt-system/?utm_source=Navigate%21+Weekly+News&utm_medium=Newsletter&utm_campaign=NCMCD241023002&oly_enc_id=1784A2382467C6V

2024-10-23




Space Force scrambling to get GPS ground system upgrades done by 2025

The Space Force is pushing hard to wrap up its long lagging programs to upgrade the ground systems and receivers for Global Position System (GPS) satellites — including ditching the Air Force B-2 bomber as a first test platform for airborne receivers capable of using the jam-resistant M-Code signal in order to speed them to cross-service aircraft operators, according to a senior service acquisition official.

“Current programs that are scheduled to complete in 2025? … There is a gun to our head to finish in 2025,” Cordell DeLaPena, program executive officer for Military Communications & Positioning, Navigation, and Timing at Space Systems Command (SSC), said on Thursday. Speaking at SSC’s annual Space Industry Days conference in Los Angeles, he said that progress is being made on the troubled ground system for command and control of the most modern GPS satellites, the Next-Generation Operational Control System (OCX).

Read more in *article*…

https://breakingdefense.com/2024/10/space-force-scrambling-to-get-gps-ground-system-upgrades-done-by-2025/

2024-10-28