China Completes BeiDou-3 Worldwide Navigation Constellation

China completed its worldwide BeiDou navigation satellite system with the launch of its final satellite on June 23, according to China Global Television Network.

The satellite launched aboard a Long March-3B carrier rocket from the Xichang Satellite Launch Center at 9:43 a.m. Beijing time (0143 GMT) on Tuesday, marking the completion of the country's domestically developed BeiDou constellation.

The launch followed a delay of after originally being scheduled for July 16 because of a technical issue discovered in pre-flight tests.

Read more in *GPS World* article. https://www.gpsworld.com/china-completes-beidou-3-worldwide-navigation-constellation/?utm_source=Navigate%21+Weekly+GNSS+News&utm_medium=Newsletter&utm_campaign=NCMCD200617003&oly_enc_id=1784A2382467C6V

2020-06-22

Coalition Forms To Defend GPS From Jamming Risk

As the new Keep GPS Working Coalition was making its opening move, Sen. James Inhofe (R-Okla.), chairman of the Senate Committee on Armed Services and a Ligado Networks skeptic, and ranking member Sen. Jack Reed (D-R.I.) will be introducing legislation that would require that Ligado cover costs to others resulting from any loss of GPS access caused by the planned 5G network. The Recognizing and Ensuring Taxpayer Access to Infrastructure Necessary for GPS and Satellite Communications Act also would impose new conditions for Ligado to satisfy before the FCC's order takes effect.

"Legislation is needed to ensure this Order does not leave consumers holding the bag," said a Senate summary of the bill.

In a first indication that the opposition was making an impression on the FCC since its unanimous approval vote, a commissioner said she would be open to taking another look at the issue.

Read more in *article*…

https://www.aopa.org/news-and-media/all-news/2020/june/24/coalition-forms-to-defend-gps-from-jamming-threat

2020-06-24

'We've bought the wrong satellites': UK Tech Gamble Baffles Experts

The UK government's plan to invest hundreds of millions of pounds in a satellite broadband company has been described as "nonsensical" by experts, who say the company doesn't even make the right type of satellite the country needs after Brexit.

The investment in OneWeb, first reported on Thursday night, is intended to mitigate against the UK losing access to the EU's Galileo satellite navigation system. But OneWeb – in which the UK will own a 20% stake following the investment – currently operates a completely different type of satellite network from that typically used to run such navigation systems.

"The fundamental starting point is, yes, we've bought the wrong satellites," said Dr Bleddyn Bowen, a space policy expert at the University of Leicester. "OneWeb is working on basically the same idea as Elon Musk's Starlink: a mega-constellation of satellites in low Earth orbit, which are used to connect people on the ground to the internet.

Read more in *Inside GNSS* article.

https://www.theguardian.com/science/2020/jun/26/satellite-experts-oneweb-investment-uk-galileo-brexit

2020-06-27

GPS Jamming Still Causing Problems in Finnmark

In recent years, the GPS net in Finnmark, Northern Norway has been down on a regular basis due to jamming of signals. District Police Chief Ellen Katrine Hætta first noticed jamming in 2017 and then notified the Norwegian Police Directorate.

The National Security Authority has analysed the jamming and in September 2018 verified that the jamming came from the east. The intelligence services have concluded that Russia was behind it.

Jamming is a way of destroying a signal through sending out one signal that overshadows another one. In this way, jamming GPS signals brings communications and navigation systems down and they lose their function.

“The last incident was not long ago. In April/May this year we registered another episode. We report all incidents to the Police Directorate. There is not much they can do about it. We as a society need to improve our systems, says Police Chief Ellen Katrine Hætta to High North News.

Read more in *article*…

https://www.highnorthnews.com/en/gps-jamming-still-causing-problems-finnmark

2020-06-26

MiRTK: Internet-enabled GNSS Corrections

Position Partners has announced the launch of MiRTK, an open architecture corrections service for GNSS equipment. MiRTK is an internet-based GNSS corrections service, an alternative to traditional UHF- or RTK-based corrections services, operating via a small modem that fits into the accessory slot of a tripod.

Cameron Waters, geospatial business manager at Position Partners, says that the MiRTK system is open architecture — compatible with all brands and models of GNSS from manufacturers including Topcon, Trimble, Leica Geosystems, Sokkia, and Hemisphere.

“Until now, users that rely on high precision GNSS for applications such as surveying and machine control had no option but to use UHF radios or a network RTK solution,” he said.

Read more in *Spatial Source* article. https://www.spatialsource.com.au/new-products/mirtk-internet-enabled-gnss-corrections?utm_medium=email&utm_campaign=SS%20Newsletter%2017062020&utm_content=SS%20Newsletter%2017062020+Version+A+CID_74e2d003177806668124b7f1e42c6e0a&utm_source=Campaign%20Monitor&utm_term=READ%20MORE

2020-06-17

Magnetic Sensors in Flight Tests as Alternative PNT to GNSS

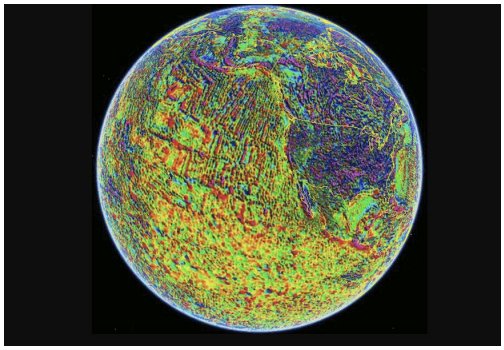
A new magnetic anomaly navigation technique (MAGNAV), researched by the Air Force Institute of Technology (AFIT), will get its wings tested aboard F-16 fightercraft this September. In an effort seeking alternatives to GPS and GNSS, MAGNAV sensors and software will be flown on Air Force Test Pilots School (AFTPS) F-16s over a test range adjacent to Edwards Air Force Base in Nevada.

“We’re hoping [these] realistic testing on realistic platforms will open the doors to further research and funding,” said Air Force Major Aaron Canciani, a lead on the project.

Canciani has worked closely with John Raquet, professor of electrical engineering and Director of the Autonomy and Navigation Technology (ANT) Center at AFIT, located at Wright Patterson AFB, near Dayton, Ohio.

Read more in *Inside GNSS* article. https://insidegnss.com/183615-2/

2020-06-15



LEO Successor to GNSS Comes Knocking

A group of Stanford Ph.D. and Masters graduates, with work experience among them at SpaceX, Ford Motor Systems, Blue Origin, Booz Allen Hamilton and other firms, has launched a start-up to start up a low-Earth orbit successor to GPS and other GNSS. The existing services, they say, are not up to the challenges of autonomy. They founded Xona Space Systems to supplant the venerable satnav systems.

“Over $300 billion per year relies on an unprotected navigation network. Intelligent systems require a navigation solution that supports safety-critical operation, centimeter positioning, and cybersecurity for millions of users,” reads their manifesto.

In a paper scheduled to present at September’s ION/IEEE PLANS conference, they lay out their approach, based a patent-pending Pulsar PNT service, using low-Earth orbit (LEO) satellites. The company asserts that Pulsar will offer ten time better accuracy than standard GNSS, stronger signals, encryption and rapid convergence times.

Read more in *Inside GNSS* article. https://insidegnss.com/leo-successor-to-gnss-comes-knocking/

2020-06-07

GPS III SV-08 'Born' With Core Mate Complete, Named Katherine Johnson

The United States Space Force's GPS III program reached another milestone with the successful core mate of GPS III Space Vehicle 08 at Lockheed Martin's GPS III Processing Facility in Waterton, Colorado, April 15. With core mate complete, the space vehicle was named in honour of NASA trailblazer and "hidden figure" Katherine Johnson.

The two-day core mate consisted of using a 10-ton crane to lift and complete a 90-degree rotation of the satellite's system module, and then slowly lowering the system module onto the satellite's vertical propulsion core. The two mated major subsystems come together to form an assembled GPS III space vehicle.

Despite the COVID-19 pandemic, the Space and Missile Systems Center (SMC) and its mission partner Lockheed Martin ensured that SV08 core mate took place, in accordance with all Centers for Disease Control and local guidelines to minimise exposure or transmission of COVID-19. The GPS III Processing Facility's cleanroom high bay was restricted to only key personnel directly supporting the operation.

Read more in *GPS World* article. https://www.gpsworld.com/gps-iii-sv-08-born-with-core-mate-complete-named-katherine-johnson/?utm_source=Navigate%21+Weekly+GNSS+News&utm_medium=Newsletter&utm_campaign=NCMCD200610003&oly_enc_id=1784A2382467C6V

2020-06-10

$11m Space Grants to Boost Businesses and Local Jobs

Minister for Industry, Science and Technology Karen Andrews said the 10 projects sharing in $11 million would boost jobs and skills in the space sector, and contribute to the nation's economic recovery from the COVID-19 pandemic.

"The space industry is a key growth sector that will form an important part of our economic recovery and help us emerge from the COVID-19 crisis stronger than ever," Minister Andrews said.

"Investment in the space sector not only supports the creation of high tech jobs here in Australia, but also develops technologies that can support other areas of competitive advantage for our nation including agriculture and mining.

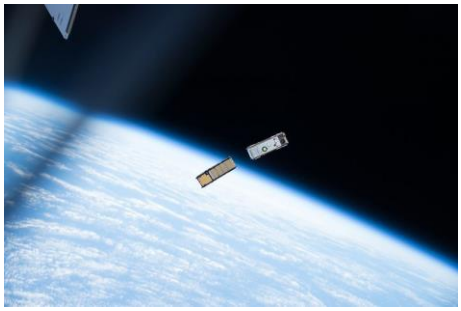
"This support will strengthen Australian business and university connections with international industry and space agencies, helping our businesses to prove themselves on the global stage and potentially secure more work in the future."

Head of the Australian Space Agency Dr Megan Clark AC said the projects showed Australia's ability to develop highly advanced technology, diversify our economy and build workforce skills to participate internationally.

Read more in *article*…

https://www.minister.industry.gov.au/ministers/karenandrews/media-releases/11m-space-grants-boost-businesses-and-local-jobs?fbclid=IwAR1knquDmCpaj8qzdQLhUfzVsChOyC2vwDLMPjRIByd9427rOyMBQJL0PiA

2020-06-17



Homeland Security Reports on PNT Backup

The U.S. Department of Homeland Security (DHS) issued a report on alternative sources of PNT on May 6. It was submitted to U.S. congressional committee leaders on April 8.

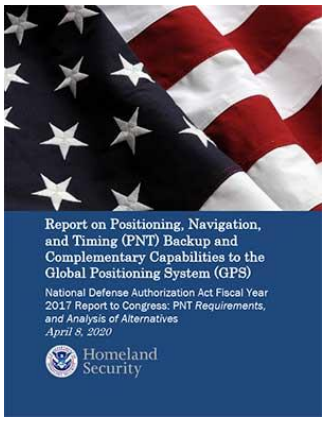
The Report on Positioning, Navigation and Timing (PNT) Backup and Complementary Capabilities to the Global Positioning System (GPS) highlights the urgent need for GPS backup for critical applications, and it identifies and characterizes a variety of solutions available to meet this need today.

Section 1618 of the 2017 National Defense Authorization Act (NDAA) of Dec. 23, 2016, required the DHS to address the need for a GPS backup by identifying and assessing viable alternate technologies and systems.

The report is a summary and analysis of that assessment by the Homeland Security Operational Analysis Center (HSOAC) of PNT systems currently used by critical infrastructure. It also provides recommendations for the federal government's next steps to increase the resilience of critical infrastructure to disruption of GPS services.

Read more in *GPS World* article. https://www.gpsworld.com/homeland-security-reports-on-pnt-backup-satelles-responds/?utm_source=Navigate%21+Weekly+GNSS+News&utm_medium=Newsletter&utm_campaign=NCMCD200603003&oly_enc_id=1784A2382467C6V

2020-06-08



ESA Project Calls for Terrestrial Navigation Systems to Reduce Risk

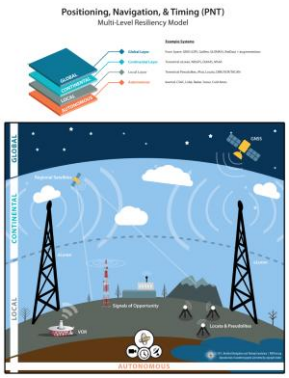
In 2018 the first-ever European Radionavigation Plan said “It is recognized that [..] GNSS should not be the sole source of PNT information. Alternative PNT systems, not necessarily using radio frequencies, should thus be put in place where the criticality of the application requires it.”

In 2019 the European Space Agency (ESA) published a permanent open call for proposals for positioning, navigation, and timing studies and systems, including those that had nothing to do with space.

One of the first fruits of this is the ESA-funded Maritime Resilience and Integrity of Navigation project, or MarRINav, recently completed by researchers in the United Kingdom.

Read more in *GPS World* article. https://www.gpsworld.com/esa-project-calls-for-terrestrial-navigation-systems-to-reduce-risk/?utm_source=Navigate%21+Weekly+GNSS+News&utm_medium=Newsletter&utm_campaign=NCMCD200603003&oly_enc_id=1784A2382467C6V

2020-06-03



China Tests Inter-satellite Links of BeiDou Navigation System

The Xi'an Satellite Control Center's tests have shown links among the satellites of the BeiDou Navigation Satellite System (BDS) are stable to ensure that the constellation can be completed as scheduled.

The tests showed that the inter-satellite links meet the demands of the construction of the global system, said Yuan Yong, a senior engineer from the control centre. He said that the tests, lasting for more than two years, covered 29 satellites of the BDS-3 system.

Since the ground stations in China cannot continuously track and control all the BDS satellites, the inter-satellite links help establish communication among them. Instructions sent by the control centre to one satellite in the constellation is transmitted to all.

Read more in *GPS Daily* article.
https://www.gpsdaily.com/reports/China_tests_inter_satellite_links_of_BeiDou_navigation_system_999.html
2020-06-10

Dr Javad Ashjaee (1949-2020)

It is with heavy hearts that we share the news of the passing of our founder Javad Ashjaee, a GPS/GNSS pioneer and visionary, on the morning of May 30, 2020, due to COVID-19 in Moscow, Russia.

Read more in *article*…

http://javad.com/jgnss/javad/news/pr20200531.html
2020-06-02

FCC Pushes Back On Ligado Decision Despite GPS Interference Concerns

U.S. Federal Communications Commission (FCC) Chairman Ajit V. Pai has responded to a congressional letter expressing objections to the April 20 FCC decision to allow Ligado to establish a broadband network.

In a May 27 email sent to *GPS World*, the FCC wrote, “Given your interest in the Ligado order that the Commission adopted unanimously last month, we wanted to share with you the text of the letter Chairman Pai recently sent to members of Congress on this topic.”

The five-member FCC voted unanimously in April to approve an order to allow Ligado Networks to deploy a low-power nationwide 5G network. Experts and policy makershave said the broadband network could — or likely would — interfere with reception of GPS signals.

On May 7, a bipartisan group of 23 members of the House Armed Services Committee (HASC) sent a letter to the FCC questioning the decision, and this is the letter the FCC is now responding to.

Read more in *GPS World* article. https://www.gpsworld.com/fcc-pushes-back-on-ligado-decision-despite-gps-interference-concerns/?utm_source=Navigate%21+Weekly+GNSS+News&utm_medium=Newsletter&utm_campaign=NCMCD200527003&oly_enc_id=1784A2382467C6V

2020-05-27