Hundreds of Future Satellites May Get GPS-Type Payloads

Hundreds of future satellites under the National Defense Space Architecture (NDSA) may carry GPS-type payloads to complement, improve, and back-up GPS satellites, per the Department of the Air Force Space Development Agency (SDA).

SDA is “interested in proliferating a low-cost L-band Position, Navigation and Timing (PNT) service as a payload on the SDA Tranche 2 Transport Layer,” per a Nov. 3 Request for Information (RFI).

“The PNT payload would include an on-orbit reprogrammable PNT signal generator, mid-size High Powered Amplifier (HPA), and associated fixed wide beamwidth antenna,” the RFI said. “The goal is to proliferate this low-cost payload onto hundreds of satellites within future SDA Tranches – potentially as early as Tranche 2. Ideally, solutions will be highly informed by the Tranche 1 Transport Layer and share technical approaches and hardware where possible as size, weight, power, cost (SWAP-C), technical readiness and manufacturability will be significant constraints.”

SDA, which has a motto of *semper citius*, Latin for “always faster,” plans to launch NDSA tranches every two years. Satellites in Tranche 1, which is to provide regional tactical data links, advanced missile detection, and beyond line of sight targeting, are to launch in fiscal 2024. Tranche 2, which is to integrate Tranche 1 for global application, is to launch in fiscal 2026.

Read more in *article*…

https://www.defensedaily.com/hundreds-of-future-satellites-may-get-gps-type-payloads/advanced-transformational-technology/

2022-11-04

Mapping Planet Earth For Better Positioning: ESA's GENESIS Mission

ESA's Navigation Directorate is planning a new satellite whose results will enable the generation of an updated global model of Earth - the International Terrestrial Reference Frame, employed for everything from land surveying to measuring sea level rise - with an accuracy down to 1 mm, while tracking ground motion of just 0.1 mm per year. This improvement, at a stroke, will have a major impact in multiple navigation and Earth science applications, including enhancing the precision of the Galileo navigation system. This mission, called GENESIS, is being proposed to ESA's Council Meeting at Ministerial Level next month.

GENESIS will work by combining and co-locating all four of the main technologies currently used for Earth geodetic measurement on the same platform for the first time, aboard a satellite in a 6 000 km altitude orbit. In the process this satellite will also obtain one of the most precisely determined orbit of any object in space, right down to millimetre scale.

Read more in *article*…

https://www.spacedaily.com/reports/Mapping_planet_Earth_for_better_positioning_ESAs_GENESIS_mission_999.html

2022-10-21

ESA Plans For Low-orbiting Navigation Satellites

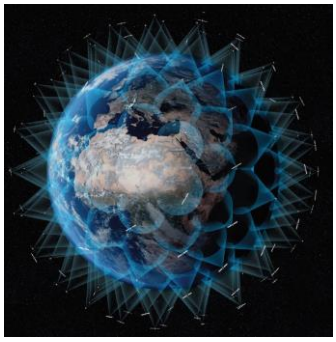
ESA’s Navigation Directorate is planning an in-orbit demonstration with new navigation satellites that will orbit just a few hundred kilometres up in space, supplementing Europe’s 23 222-km-distant Galileo satellites. Operating added-value signals, these novel so-called ‘LEO-PNT’ satellites will investigate a new multi-layer satnav system-of-systems approach to deliver seamless Positioning, Navigation and Timing services that are much more accurate, robust and available everywhere.

Global in coverage, free for everyone to use, Global Navigation Satellite Systems

(GNSS) such as Europe's Galileo have already transformed our society, and due to

their sheer omnipresence their influence continues to grow. In 2021, the population of satnav receivers reached 6.5 billion receivers around the world and the sector is projected to maintain a 10% annual growth rate in the years ahead. But in various respects the standard GNSS approach is nearing the limits of optimum performance – to get even better, added ingredients are becoming essential.

Read more in *article*…
https://www.esa.int/Applications/Navigation/ESA_plans_for_low-orbiting_navigation_satellites
2022-10-26



Researchers Find Way to Use Starlink Signals As Alternative to GPS

The US Global Positioning System (GPS) is a crucial tool for navigation, but what happens if the satellites go down or face jamming attempts? New research shows SpaceX's satellite internet service Starlink could operate as a viable alternative, whether the company likes it or not.

The research comes from a team at the University of Texas at Austin's Radionavigation Laboratory. They reverse-engineered the signals sent from the thousands of Starlink satellites in orbit to show how they can be used for positioning purposes.

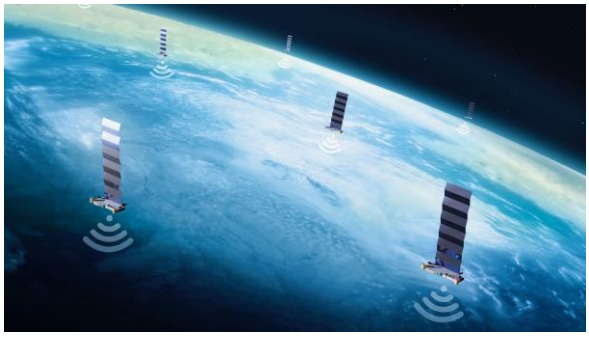
The research "could form the basis of a useful navigation system" to rival the US GPS and other equivalent positioning systems from China, Russia, and India, *MIT Technology Review* reports.

Professor Todd Humphrey from the University of Texas's Radionavigation Lab, asked SpaceX about using Starlink as a global navigation satellite system akin to GPS. The US Army has been funding Humphrey's research, and was looking for a backup to the US GPS system, which currently operates 31 active satellites at about 12,500 miles above the planet, *MIT Technology Review* notes.

Read more in *article*…

https://au.pcmag.com/networking/96903/researchers-find-way-to-use-starlink-signals-as-alternative-to-gps

2022-10-22



Celestia UK Wins ESA Contract to Improve GNSS Signals

Celestia UK has won a €800,000 European Space Agency (ESA) contract to develop an innovative positioning, navigation and timing(PNT) solution based on LEO satellite constellations for 5G networks and applications. The contract was granted under ESA's Navigation, Innovation and Support Programme (NAVISP).

Celestia's LEO-SYN+ project is intended to boost the reliability and performance of GNSS. It will use low-Earth-orbit (LEO) satellite signals of opportunity to provide a resilient position and time reference for 5G networks and improve the robustness of GNSS signals.

It includes development of a PNT receiver compatible with multi-GNSS constellations and LEO signals of opportunity, as well as testing of the solution in 5G networks. A prototype receiver will validate the product design and the technology development, paving the way for additional applications of the technology to other critical infrastructures after the initial ESA NAVSIP roll-out.

Read more in *GPS World* article. https://www.gpsworld.com/celestia-uk-wins-esa-contract-to-improve-gnss-signals/?utm_source=Navigate%21+Weekly+GNSS+News&utm_medium=Newsletter&utm_campaign=NCMCD220928002&oly_enc_id=1784A2382467C6V

2022-09-27

China Launches CentiSpace-1 Navigation Enhancement Satellites

On Oct. 7, China launched a pair of satellites designed to enhance BeiDou navigation signals.

The CentiSpace-1 S5 and S6 satellites were launched via a Long March 11 solid rocket that lifted off at 9:10 a.m. EDT from a mobile sea platform in the Yellow Sea. Launch success was confirmed by the China Aerospace Science and Technology Corporation (CASC) 90 minutes later.

The CentiSpace-1 satellites are designed to enhance the accuracy of signals from China's BeiDou navigation and positioning satellite system. The satellites will also conduct inter-satellite laser link experiments.

Read more in *GPS World* article. https://www.gpsworld.com/china-launches-centispace-1-navigation-enhancement-satellites/
2022-10-11

New Russian Navigation Satellite Now In Orbit

A Fregat booster successfully delivered a Glonass-K navigational satellite into its designated orbit, Russia's Defense Ministry reported on Oct. 10. Glonass-K No. 17L is the fifth K satellite to join the constellation.

"A Soyuz-2.1b medium-class carrier rocket that blasted off at 05:52 a.m. Moscow time on October 10 from the Plesetsk spaceport in the Arkhangelsk Region successfully delivered a Russian Glonass-K navigational satellite into the target orbit at the designated time," the ministry said in a statement.

Liftoff and the delivery into the designated orbit proceeded in normal mode, the ministry said, and the ground-based facilities of Russia's Aerospace Forces assumed control.

"The Russian Glonass-K navigational space vehicle launched on Monday, October 10, from the Plesetsk spaceport by a combat team of the Space Troops of the Aerospace Forces was delivered into the target orbit at the designated time and placed under the control of the ground-based facilities of the Titov Main Testing Space Center of the Aerospace Forces' Space Troops," the statement said.

Read more in *GPS World* article. https://www.gpsworld.com/new-russian-navigation-satellite-now-in-orbit/

2022-10-11

GNSS and PNT Experts to Gather in Sydney

IGNSS 2022 is Australasia's leading conference and exhibition for technologies, products and services in positioning, navigation and timing, including GNSS.

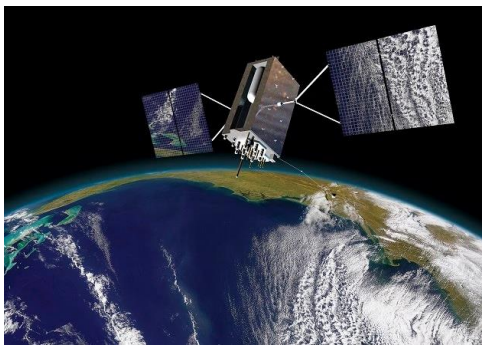
At the conference, leaders in GNSS and PNT will examine the latest technologies, present cutting edge research and discuss in open forums the implications for policy, market development and positioning infrastructure deployment.

The topics to be canvassed include:

- Autonomy on land, air, sea and in space
- Aviation and avionics
- Cooperative Intelligent Transport Systems
- Machine guidance applications in agriculture, construction and mining
- Maritime applications
- Uncrewed aerial systems
- Space applications of PNT in Earth orbit and for lunar and Martian exploration
- Positioning Infrastructure
- GNSS vulnerability, resilience and risk
- Interference detection and mitigation
- Policies and standards
- SBAS and other augmentations
- Datums and geodesy
- National and international GNSS developments
- Emerging application areas for GNSS
- Key Industries and their reliance on GNSS
- Embracing the multi-GNSS era
- Cyber security in PNT applications and infrastructure
- Alternative PNT
- State of the art in PNT algorithms and software development
- GNSS aiding and sensor fusion
- Positioning in GNSS-denied environments
- Development of GNSS receiver hardware and firmware
- Precise positioning using smartphones

Read more in *Spatial Source* article. https://www.spatialsource.com.au/gnss-and-pnt-experts-to-gather-in-sydney/?utm_campaign=SS%20-%20Overall%20Publication%20-%20Master&utm_medium=email&_hsmi=229314828&_hsenc=p2ANqtz--QWJZpPNKhTIXftqchThLO0Fiv8U5zO8BVwTHt70XPRpZBmUr1zlaYAPBlL85wT4XPhFI7Uyj4L0uJ8wozsfaRslU2rw&utm_content=229314828&utm_source=hs_email

2022-10-07



India's Push For Home-grown Navigation System Jolts Smartphone Giants

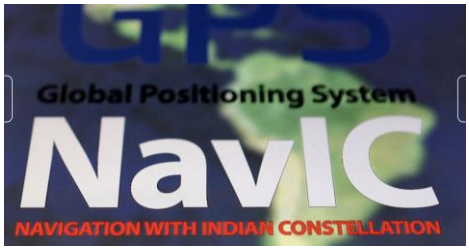
India is pushing tech giants to make smartphones compatible with its home-grown navigation system within months, worrying the likes of Samsung, Xiaomi and Apple who fear elevated costs and disruptions as the move requires hardware changes, according to two industry sources and government documents seen by Reuters.

In line with Prime Minister Narendra Modi's drive for self-reliance, India has over the years expanded the use of its regional navigation satellite system called NavIC (Navigation with Indian Constellation).

Read more in *article*…

https://www.reuters.com/technology/exclusive-indias-push-home-grown-navigation-system-jolts-smartphone-giants-2022-09-26/

2022-09-26



Latest Galileo Satellites Join Constellation With Enhanced, Faster Fix

Europe’s latest Galileo satellites in space have joined the operational constellation, transmitting navigation signals to three billion users across Earth as well as relaying distress calls to rescuers.

Their entry into service follows a summer test campaign and will result in a measurable increase in positioning accuracy and improved data delivery performance of the overall Galileo system.

Galileo satellites 27-28 were launched at the end of 2021 and underwent in-orbit test review at the end of April. The review was conducted by ESA, satellite manufacturer OHB, and navigation payload maker Surrey Satellite Technology Ltd (SSTL).

Key findings showed both satellites' payloads are performing extremely well — among the best in the entire constellation — and the satellites entering into service increase the position accuracy and robustness of the overall Galileo system.

Read more in *GPS World* article. https://www.gpsworld.com/latest-galileo-satellites-join-constellation-with-enhanced-faster-fix/?utm_source=Navigate%21+Weekly+GNSS+News&utm_medium=Newsletter&utm_campaign=NCMCD220921003&oly_enc_id=1784A2382467C6V

2022-09-25

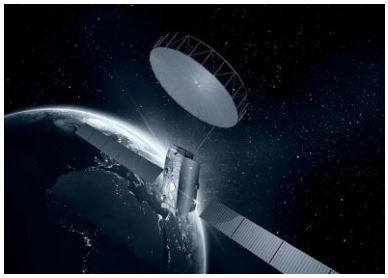
SouthPAN Early Open Services Are Now Live

Providers and users of positioning services across Australasia will now have the option of more accurate and reliable services, with Southern Positioning Augmentation Network (SouthPAN) early Open Services going live as of 27 September. The development comes just two weeks after Geoscience Australia awarded a $1.18 billion, 19-year SouthPAN communications contract to Lockheed Martin Australia.

SouthPAN will boost positioning accuracy from as much as 5 to 10 metres, to as little as 10 centimetres — a 50-fold improvement. With early Open Services, industry and the community can harness SouthPAN and immediately integrate it with existing equipment or products to create or enhance positioning service offerings to end-users.

Read more in *Spatial Source* article. https://www.spatialsource.com.au/southpan-early-open-services-are-now-live/?utm_campaign=SS%20-%20Overall%20Publication%20-%20Master&utm_medium=email&_hsmi=227505989&_hsenc=p2ANqtz--RVFDR79iOCgV91aC3vB9EANwIuom6IoVSZLokdBwd2g9Fc142sLlT5NuN0-2CCHgd6qYRspxA2gDmCpBstnst2QWwLQ&utm_content=227505989&utm_source=hs_email

2022-09-27



China and Russia to Boost Satellite Navigation Systems with New Ground Stations

China and Russia have agreed to build satellite ground stations on each other's soil to improve how their global navigation systems work together, according to Russian space agency Roscosmos. The agreement aimed to make Russia's GLONASS and China's BeiDou systems more reliable and accurate.

Under contracts China and Russia signed at a regular meeting on satellite navigation, GLONASS stations will be installed in three Chinese cities: Changchun in the northeast, Urumqi in the northwest and Shanghai in the east.

BeiDou stations will be built in Obninsk in western Russia, Irkutsk in eastern Siberia and Petropavlovsk-Kamchatsky in the Russian Far East.

Read more in *article*…

https://www.scmp.com/news/china/diplomacy/article/3194387/china-and-russia-boost-satellite-navigation-systems-new-ground

2022-09-30