

## **GNSS Data Show Lebanon Blast Affected Ionosphere**

Just after 6 p.m. local time (15:00 UTC) on Aug. 4, 2020, more than 2,750 tons worth of unsafely stored ammonium nitrate exploded in Lebanon's port city of Beirut, killing around 200 people, making more than 300,000 temporarily homeless, and leaving a 140-metre-diameter crater in its wake. The blast is considered one of the most powerful non-nuclear, man-made explosions in human history.

Now, calculations by Hokkaido University scientists in Japan have found that the atmospheric wave from the blast led to electron disturbances high in Earth's upper atmosphere. They published their findings in the journal *Scientific Reports*.

The team of scientists, which included colleagues from the National Institute of Technology Rourkela in India, calculated changes in total electron content in Earth's ionosphere: the part of the atmosphere from around 50 to 965 kilometres in altitude. Natural events like extreme ultraviolet radiation and geomagnetic storms, and man-made activities like nuclear tests, can cause disturbances to the ionosphere's electron content.

Read more in *GPS World* article. [https://www.gpsworld.com/gnss-data-shows-lebanon-blast-affected-ionosphere/?utm\\_source=Navigate%21+Weekly+GNSS+News&utm\\_medium=Newsletter&utm\\_campaign=NCMCD210317002&oly\\_enc\\_id=1784A2382467C6V](https://www.gpsworld.com/gnss-data-shows-lebanon-blast-affected-ionosphere/?utm_source=Navigate%21+Weekly+GNSS+News&utm_medium=Newsletter&utm_campaign=NCMCD210317002&oly_enc_id=1784A2382467C6V)

2021-03-22



## **How Google Earth Changed The World**

The latest battleground for the world's biggest tech companies is one of its oldest forms of data: maps. Apple plans to release a new maps app this autumn featuring live traffic information derived from real-time iPhone user stats, and 3D imagery harvested by a fleet of Apple aircraft. With typical immodesty, the company is calling its new creation "the most beautiful, powerful mapping service ever".

Meanwhile, Amazon is teaming up with Nokia to produce a mapping app for its latest Kindle Fire tablets. Amazon and Apple are competing with Google, which until now has had a near-monopoly in online maps, with Google Maps, Earth and Street View.

Google Earth is the subject of the fascinating final chapter in a new book by Jerry Brotton, *A History of the World in Twelve Maps*. It is, the British professor says, a late departure in the history of maps, yet also owes much to the heritage outlined in his book. "Google Earth looks like a traditional atlas," he explains.

Read more in *article...*

<https://www.independent.co.uk/life-style/gadgets-and-tech/features/google-earth-maps-street-view-b1821781.html>

2021-03-24



## **The Same Sea Level For Everyone**

Maps generally indicate elevation in metres above sea level. But sea level is not the same everywhere. A group of experts headed by the Technical University of Munich (TUM), has developed an International Height Reference System (IHRIS) that will unify geodetic measurements worldwide.

How high is Mount Everest? 8848 metres? 8844 metres? Or 8850 metres? For years, China and Nepal could not agree. In 2019, Nepal sent a team of geodesists to measure the world's highest mountain. A year later a team from China climbed the peak. Last December the two governments jointly announced the outcome of the new measurement: 8848.86 metres.

The fact that both China and Nepal recognise this result must be seen as a diplomatic success. It was made possible by the new International Height Reference System (IHRIS), used for the first time by the geodetic specialists conducting the new measurement.

Read more in *Terra Daily* article.

[https://www.terradaily.com/reports/The same sea level for everyone 999.html](https://www.terradaily.com/reports/The_same_sea_level_for_everyone_999.html)



## **Industry Members, Non-profit Urge Congress to Fund GPS Alternatives**

In separate letters to members of the House of Representatives and the Senate, seven companies and a non-profit urged Congress to support alternative positioning, navigation and timing systems (PNT) with the “necessary funds and other appropriate policy tools.”

Signing the letter were NextNav, UrsaNav, Satelles, Hellen Systems, OPNT, Orolia, Microchip, and the non-profit Resilient Navigation and Timing Foundation (RNTF). The letters focus on and endorse the system-of-systems approach outlined in the Department of Transportation’s (DOT) recent report to Congress on the results of its GPS Backup Technology Demonstration. The report found an adequate and robust American PNT system should include space-based L-band signals, low-frequency (LF) and ultra-high-frequency (UHF) signals, and fibre connections between the terrestrial LF and UHF transmitters.

“Our country depends on GPS for critical infrastructure, and there is an urgent need for resiliency being built into our critical infrastructure. Before the report came out, some of us had different ideas of how the U.S. should go forward,” said Ganesh Pattabiraman, CEO of NextNav. “But the DOT report provided the data to make it very clear that it is a combination of technologies that need to come together to truly enable nationwide backup to GPS, and it was good to see we could get industry alignment on the findings.”

Read more in *GPS World* article. [https://www.gpsworld.com/industry-members-non-profit-urge-congress-to-fund-gps-alternatives/?utm\\_source=Navigate%21+Weekly+GNSS+News&utm\\_medium=Newsletter&utm\\_campaign=NCMCD210317002&oly\\_enc\\_id=1784A2382467C6V](https://www.gpsworld.com/industry-members-non-profit-urge-congress-to-fund-gps-alternatives/?utm_source=Navigate%21+Weekly+GNSS+News&utm_medium=Newsletter&utm_campaign=NCMCD210317002&oly_enc_id=1784A2382467C6V)

2021-03-22



## **How Galileo Performed Its Authenticated Positioning Fix**

In a first for any satellite navigation system, Galileo has achieved a positioning fix based on open-service navigation signals carrying authenticated data. Intended as a way to combat malicious spoofing of satnav signals, this authentication testing began at ESA's Navigation Laboratory — the same site where the very first Galileo positioning fix took place back in 2013.

These historic first authenticated signal position, velocity and timing fixes were made using a total of eight Galileo satellites for around two hours on Nov. 18. The tests represent a first proof of concept for an eventual operational service offering positioning with authenticated data to users.

Spoofing has, for instance, been demonstrated as a means of forcing down drones or redirecting ships, while some high security locations — as well as disrupted international borders — have become notorious for spoofing signals that prevent the reliable use of satnav in their vicinity.

Read more in *GPS World* article. [https://www.gpsworld.com/how-galileo-performed-its-authenticated-positioning-fix/?utm\\_source=Navigate%21+Weekly+GNSS+News&utm\\_medium=Newsletter&utm\\_campaign=NCMCD210310003&oly\\_enc\\_id=1784A2382467C6V](https://www.gpsworld.com/how-galileo-performed-its-authenticated-positioning-fix/?utm_source=Navigate%21+Weekly+GNSS+News&utm_medium=Newsletter&utm_campaign=NCMCD210310003&oly_enc_id=1784A2382467C6V)

2021-03-15



## **Spaceopal, GSA Sign Contract for Galileo High Accuracy Service**

Spaceopal and the European GNSS Agency (GSA, the future EUSPA, the European Union Agency for the Space Programme) have signed a contract for the development of an innovative reference algorithm and user terminal for the Galileo High Accuracy Service (HAS). Spaceopal is the prime contractor for Galileo's operational services.

Spaceopal is an equal-share joint venture between Telespazio, a Leonardo (67%) and Thales (33%) company, and DLR Gesellschaft für Raumfahrtanwendungen (GfR) GmbH. Spaceopal will develop the solution with the support of its shareholders DLR-GfR and Telespazio, and partners such as ANavS GmbH, the DLR IKN, IAB GmbH and Iguassu Software Systems.

The project, awarded within the "Galileo Reference High Accuracy Service User Algorithm and User Terminal" Call, will develop the reference algorithm for HAS, which will be made publicly available and will be used for its validation. The user terminals at a high technology readiness level provided to GSA will serve as a blueprint and further facilitate the adoption of the European GNSS.

Spaceopal will develop the solution in the next 12 months, followed by a 6-month period of providing engineering support to the GSA for testing activities, training and demonstrating the performance of Galileo HAS.

Read more in *GPS World* article. [https://www.gpsworld.com/spaceopal-gsa-sign-contract-for-galileo-high-accuracy-service/?utm\\_source=Navigate%21+Weekly+GNSS+News&utm\\_medium=Newsletter&utm\\_campaign=NCMCD210310003&oly\\_enc\\_id=1784A2382467C6V](https://www.gpsworld.com/spaceopal-gsa-sign-contract-for-galileo-high-accuracy-service/?utm_source=Navigate%21+Weekly+GNSS+News&utm_medium=Newsletter&utm_campaign=NCMCD210310003&oly_enc_id=1784A2382467C6V)

2021-03-15



## Russia ‘Jamming’ RAF Jets Over Cyprus

Russia has allegedly tried to jam signals in an act of electronic warfare against British aircraft taking off from RAF Akrotiri, outside Limassol, UK media reports claim.

Military intelligence sources said a “hostile state” had regularly attempted to interfere with the A400M transport aircraft’s satellite communications, leaving RAF Akrotiri while troops were on board. UK newspapers *The Times* and *The Daily Telegraph* both carried the story.

The attacks could have prevented the pilot from knowing where the aircraft was or the direction it was flying in and potentially resulted in casualties. None of the attempts was successful.

The only two hostile states close enough to try to jam the signals were Syria and Russia, with Russia understood to be the only country capable of doing so, said *The Times*. According to *the Daily Telegraph*, the chief of defence intelligence warned Britain is being confronted by “brinkmanship and threshold warfare”.

Read more in *article*...

<https://www.financialmirror.com/2021/03/19/russia-jamming-raf-jets-over-cyprus/>

2021-03-19



Ten Years of Safer Skies With Europe's Other Satnav System

With 26 satellites in orbit and more than two billion receivers in use, Europe's Galileo satellite navigation system has made a massive impact. But our continent has another satnav system that has been providing safety-of-life services for ten years now - chances are that you've benefited from it without noticing.

Its name is EGNOS, the European Geostationary Navigation Overlay Service. Transmitting signals from a duo of satellite transponders in geostationary orbit, EGNOS gives additional precision to US GPS signals - delivering an average precision of 1.5 metres over European territory, a tenfold improvement over un-augmented signals in the worst-case - and also confirmation of their 'integrity' - or reliability - through additional messaging identifying any residual errors.

While its Open Service has been in general operation since 2009, EGNOS began its EU-guaranteed safety-of-life service in March 2011.

Read more in *GPS Daily* article.

[https://www.gpsdaily.com/reports/Ten\\_years\\_of\\_safer\\_skies\\_with\\_Europes\\_other\\_satnav\\_system\\_999.html](https://www.gpsdaily.com/reports/Ten_years_of_safer_skies_with_Europes_other_satnav_system_999.html)

2021-03-18



## **Federal Policy Aimed at GPS Interference, Critical Infrastructure**

In its closing days, the Trump administration issued several new policy documents affecting positioning, navigation and timing (PNT) issues. Some have questioned the long-term impact of these, given the significant policy differences between the previous and current administrations. Yet policies in relatively non-controversial areas such as PNT are generally developed by career personnel who tend to remain in place from administration to administration. While they must adhere to the philosophical tenets of extant elected officials, these policies tend to endure longer than others.

Even if this weren't the case, considering the wealth of other issues the new administration is grappling with, these new policies could remain in force for some time, even if the new regime ultimately decides to change them. Several themes run through many of the documents. These include:

- Space-based PNT is vulnerable and must be protected.
- America needs to monitor for GNSS disruption.
- More sources of PNT than just GPS are needed.

Read more in *GPS World* article. [https://www.gpsworld.com/federal-policy-aimed-at-gps-interference-critical-infrastructure/?utm\\_source=Navigate%21+Weekly+GNSS+News&utm\\_medium=Newsletter&utm\\_campaign=NCMCD210303002&oly\\_enc\\_id=1784A2382467C6V](https://www.gpsworld.com/federal-policy-aimed-at-gps-interference-critical-infrastructure/?utm_source=Navigate%21+Weekly+GNSS+News&utm_medium=Newsletter&utm_campaign=NCMCD210303002&oly_enc_id=1784A2382467C6V)

2021-03-07



## The Networks That Aim to Track GPS Interference Around the World

The U.S. Federal Aviation Administration (FAA) and Federal Communications Commission (FCC) do have procedures for finding people deliberately or accidentally interfering with GPS signals. When pilots reported mysterious, sporadic GPS jamming near Wilmington Airport in North Carolina, the FAA eventually identified a poorly designed antenna on a utility company's wireless control system. "But this took many weeks, maybe months," Walter tells Spectrum. "Our goal is to track down the culprit in days."

Walter's team was working on a drone that would autonomously sniff out local signals in the GPS band, without having to rely on GPS for its own navigation. "But we didn't have permission to fly drones in Hayward's airspace and it wasn't quite at the point where we could just launch it and seek out the source of the interference," says Walter.

Instead, Walter had a different idea. Why not use the GPS receivers in other aircraft to crowdsource a solution? All modern planes carry ADS-B transponders—devices that continually broadcast their GPS location, speed and heading to aid air traffic control and avoid potential collisions. These ADS-B signals are collected by nearby aircraft but also by many terrestrial sensors, including a network of open-access receivers organized by OpenSky, a Swiss non-profit."

Read more in *article*...

<https://spectrum.ieee.org/tech-talk/aerospace/aviation/the-networks-that-aim-to-track-gps-interference-around-the-world>

2021-03-03

