

28 febbraio 2022

*(English text at the bottom)*

## GNSS INTERFERENCE ON AIRCRAFT

Gentili Colleghi,

Da IFALPA un interessante Safety Bulletin riguardante possibili interferenze (sia intenzionali che accidentali) al segnale GNSS (Global Navigation Satellite System), sistema con sempre maggior diffusione nell'ambito della navigazione aerea e per l'effettuazione di procedure strumentali di avvicinamento.

Problematica di cui gli equipaggi di volo devono essere consapevoli per poter pianificare, eventualmente, soluzioni alternative.

Di seguito il bollettino IFALPA.

Buona lettura.

ANPAC – Dipartimento Tecnico

[dt@anpac.it](mailto:dt@anpac.it)



---

English Version

## GNSS INTERFERENCE ON AIRCRAFT

Dear Colleagues,

From IFALPA a Safety Bulletin concerning interference (whether intentional or unintentional) to the GNSS (Global Navigation Satellite System) signal, a system with increasing diffusion in the field of air navigation and to perform instrumental approach procedures.

Flight Crews should be aware of the potential risk and plan for alternative procedures as necessary.

Here below the IFALPA safety bulletin.

Enjoy the reading.

ANPAC – Dipartimento Tecnico

[dt@anpac.it](mailto:dt@anpac.it)



**ANPAC**  
Italy alpa



# GNSS Interference on Aircraft

## BACKGROUND

Modern air traffic relies heavily on the internal accuracy of aircraft systems and the aircraft's ability to monitor its own reliability. In recent years, satellite-based Communication, Navigation, and Surveillance (CNS) services have been taking a growing part in the overall ATM system, and aircraft are becoming more reliant on space-based signals.

The accuracy achieved by these signals enables aircraft to perform instrument procedures without the need to rely on ground-based navigational aids, facilitates the reduction of separation by ATC and helps optimizing airspace capacity. Many aircraft navigation and warning systems rely heavily on accurate position.

## REASONS FOR SIGNAL LOSS

Satellite signals are by nature very weak when they arrive at the receiver and thus vulnerable to interference, both natural or artificial, intentional (including jamming and spoofing) or unintentional (malfunctions). There is concern about the proliferation of interference capable equipment including portable electronic devices (PEDs), incorrectly operated GNSS repeaters, miss-operated test equipment, and the foreseeable proliferation of sophisticated spoofing devices in the future.

For example, Personal Privacy Devices (PPDs) designed to make their users 'untraceable' by jamming GNSS signals around them, can also interfere with aircraft or airport Ground-Based Augmentation System (GBAS) and ADS-B ground stations at close distance.

Many instances of en-route signal loss have been linked to the military. Whilst investigations cannot always confirm military activity as the cause of the outages with certainty, this remains likely for cases near conflict zones. These zones are normally closed to civilian traffic, which is re-routed, but interference to CNS services can extend far outside of the prohibited airspace, in particular when high power jammers are used, impacting a very large volume of airspace.

## EFFECTS OF GNSS SIGNAL INTERFERENCE ON AIRCRAFT

The effects of a degradation of the GNSS signal vary greatly. Satellite signal jamming is not always identified by aircraft systems or the crew, but can have a serious effect on the accuracy of navigation systems and, in some cases, results in unusual system behaviour. For example, some aircraft types have lost the enhanced functions of EGPWS and have experienced Terrain Avoidance and Warning System (TAWS) errors which triggered sudden, unwarranted warnings, including during instrument approaches. Other aircraft lost their clocks, and in some cases of long-lasting signal loss, the clocks began to move backwards.

As false warnings occur, genuine ones may not, subjecting aircraft to more safety hazards. This could have a long-lasting effect on the crew's trust in the aircraft's warning systems: a pilot receiving a false warning due to system position inaccuracy may be tempted to disregard a similar – but real - warning later. Moreover, false warnings increase pilot workload and could cause distraction during critical phases of flight.

GNSS signal interference (whether intentional or unintentional) can occur at any time, with or without prior notice. Flight Crews should be aware of the potential risk and plan for alternative procedures as necessary