airservices

Safety Net

USING GPS AS A VFR NAVIGATION TOOL

Ongoing improvement to the accuracy, affordability, and usability of GPS and its flying-related applications means a growing number of pilots are adopting it as a navigation aid.

While GPS can be used, there have been instances where over reliance, sole use, or other GPS related issues were identified as primary contributory factors to safety occurrences.

This Safety Net aims to highlight some of the common issues that can affect VFR pilots when using GPS to assist with navigation.

Use of GPS to supplement visual navigation

AIP GEN 1.5 says that pilots operating under VFR may use GPS to supplement map reading and other visual reference navigation techniques. This means that the pilot in command must positively fix the aircraft's position by visual reference to features shown on topographical charts at intervals not exceeding 30 minutes. The GPS can be used to cross check this process.

Tolerances for avoiding controlled airspace

As stated in **AIP ENR 1.1**, to ensure that controlled airspace or restricted areas are not infringed, the following tolerances must be applied to the intended flight path of a powered aircraft conducting visual navigation:

0 -- 2,000 AGL ±1NM (±2NM by night)

2,001 -- 5,000 AGL ±2NM (±3NM by night)

5,001 -- 10,000 AGL ±4NM (±5NM by night).

Common issues related to use of GPS for VFR flights

There have been safety incidents reported relating to the use and misuse of GPS by VFR pilots. Some of the common issues and hints for how to avoid are outlined in the following section.

Issue	How to avoid
Airspace infringements	
▪ Tolerances to remain outside of controlled airspace are not included in the planning or execution of flight	▪ Apply tolerances to remain clear of Controlled Airspace (AIP ENR 1.1-40 paragraph 19.12)
▪ Pilot uses GPS distance from location to remain outside of controlled airspace	▪ Controlled airspace steps may be based on various references including the aerodrome DME, the Aerodrome Reference Point (ARP) or runway threshold. On the VTC the steps will refer to the datum used (eg 30 DME, 7 NM ARP, 8 NM FM THR RWY 01)
▪ Due to apparent accuracy of GPS, the pilot believes they can fly closer to the boundary of controlled airspace	▪ In addition to the application of appropriate tolerances, consider whether or not you are capable of flying as accurately as the GPS, particularly if trying to remain VMC
▪ Pilot uses the 'GO TO' function rather than planning via established routes	▪ Unlike the airways route structure, the 'GO TO' function does not consider any restricted or controlled airspace, or minimum safe altitudes ▪ Consider what you would do and where you would be if the GPS was to fail and/or you went IMC

12-061APR Corporate Communication

Issue	How to avoid
GPS usage and technical issues	
▪ The pilot is not trained and competent in the use of the particular GPS unit ▪ Incorrect/invalid information in the GPS database ▪ The pilot makes errors inputting data into the GPS (both in the air and on the ground) ▪ The pilot gets distracted by entering data into GPS	▪ Ensure you are trained on the use of your GPS and can confidently operate it whilst flying in all scenarios ▪ Ensure your GPS subscriptions are up to date ▪ Always cross-check information with a current chart ▪ Always remember that you are a VFR flight and lookout is important
▪ GPS is not (correctly) installed as part of the aircraft and/or: - battery goes flat - antenna provides poor reception, is disconnected or subject to interference	▪ Where possible use a GPS which has been installed correctly as part of the aircraft ▪ Ensure that the GPS is only used to supplement visual navigation ▪ Plan and execute your flight so that if the GPS fails, it does not affect your ability to safely continue

Issue	How to avoid
General	
▪ Confusion and additional workload for pilots and air traffic control caused by the pilot only knowing their position relevant to GPS data, rather than promulgated position or a navigational aid	▪ Air traffic control do not have reference to your GPS information and will generally require your position or other information referenced to their particular location or a position identified on the VTC
▪ Excessive reliance on GPS leading to a loss of pilot visual navigation skills and a loss of capability when GPS is not available	▪ The GPS is a means of supplementing your visual navigation processes ▪ Plan and execute your flight so that if the GPS fails, it does not affect your ability to safely continue

Conclusion

The use of a GPS can significantly assist VFR pilots. However, it should only be used to supplement visual navigation techniques, not as a primary navigation source.

Remember to always plan as a visual navigation flight, including the appropriate tolerances for controlled and restricted airspace. Learn how to use your GPS and be aware of its limitations. When flying always ensure you are in a position where if the GPS failed, it would not put you in an unsafe or unwanted situation.

References

- AIP GEN 1.5 Para 8.5 - Global Navigation Satellite System
- AIP ENR 1.1 Para 19.2 – Flight under the VFR
- AIP ENR 1.1 Para 19.5 – Position Fixing
- AIP ENR 1.1 Para 19.12 - Avoiding Controlled Airspace

For more information

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Below: On the VTC, Avalon airspace boundaries are shown with reference to both the ARP and the DME.