

Automatic Dependent Surveillance – Broadcast (ADS-B) Out Preflight Responsibilities

Purpose: To describe preflight responsibilities for Automatic Dependent Surveillance–Broadcast Out (ADS-B Out) operations in United States National Airspace System. The Federal Aviation Administration will incorporate this guidance into the next revision of Advisory Circular (AC) 90–114A Change 1, *Automatic Dependent Surveillance – Broadcast Operations* (https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_90-114A_CHG_1.pdf).

Background: In 2016, the FAA published guidance for ADS-B operations in AC 90–114A CHG 1. Since that time, the agency has refined and clarified ADS-B policy in a number of areas, most significantly with respect to preflight requirements and responsibilities for operators with specific ADS-B position sources. Use the information in this Graphic Notice to supplement guidance in AC 90–114A CHG 1.

a. Flight Planning Requirements. Operators of aircraft with position sources identified in this Notice are expected to conduct a preflight prediction to ensure compliance with Title 14 of the Code of Federal Regulations (14 CFR) section § 91.227(c)(1)(i) and (iii) (https://www.ecfr.gov/cgi-bin/text-idx?SID=8137158693744ba666e318c1f474d81b&node=se14.2.91_1227&rgn=div8). Preflight prediction requirements are summarized in Table 1–1 below.

b. Global Positioning System (GPS) Performance Prediction. For aircraft equipped with Technical Standard Order (TSO) C129() or TSO–C196() GPS units to support ADS-B Out equipment, a Navigation Accuracy Category for Position (NACp) and Navigation Integrity Category (NIC) GPS service availability prediction should be performed for the intended route of flight (route and time) using available GPS satellite information and guidance published in AC 90–114A CHG 1 as amended here.

Note: It is not necessary for operators of aircraft equipped with the Wide Area Augmentation System (WAAS) (TSO–C145 or TSO–C146) receivers to conduct a preflight availability prediction. Operators of aircraft equipped with specific aircraft–based augmentation systems (ABAS) that have been reviewed by the FAA and are approved for ADS-B operations (i.e., 14 CFR §§ 91.225 [https://www.ecfr.gov/cgi-bin/text-idx?node=se14.2.91_1225&rgn=div8] and 91.227) also do not need to conduct a preflight availability prediction.

1. Prediction Methods. Refer to AC 90–114A CHG 1, section 4–5c.(1) for a discussion of preflight availability prediction methods.

2. Flight Planning Guidance. Predictions should be conducted within 24 hours of departure and as close to departure time as feasible, but with sufficient time to re–plan the flight in the event a segment along the planned route is predicted to have insufficient GPS service availability. The prediction should be reevaluated prior to flight if new information (i.e., a Notice to Airmen) provides notice of an unscheduled GPS satellite outage. In the event of a *predicted* loss of performance for any part along the intended route in the airspace where ADS-B Out is required, the flight should be re–planned so that ADS-B Out performance requirements specified in 14 CFR § 91.227 can be met. Alternatively, to continue on the planned route, operators must obtain air traffic control (ATC) authorization to deviate from applicable regulatory requirements.

c. Operations conducted under Exemption No. 12555. Operators approved to conduct operations under the conditions and limitations of Exemption No. 12555 (<https://www.faa.gov/nextgen/equipadsb/research/exemption/media/Exemption12555.pdf>) should adhere to the guidance provided in this section.

1. Under the conditions of Exemption No. 12555, operators with receivers meeting the performance requirements of TSO–C196() may operate in designated airspace for which ADS-B Out is required when the

aircraft’s NACp and NIC do not meet the performance specified in 14 CFR § 91.227. For these operations, the operator does not need to conduct any preflight availability prediction.

2. Operators conducting operations under Exemption No. 12555 equipped with TSO-C129() receivers may operate where ADS-B Out is required with performance below that specified in 14 CFR § 91.227 when the FAA determines use of backup surveillance is available. In these instances, operators must use the FAA Service Availability Prediction Tool (SAPT). The applicable SAPT run should be completed no more than 3-hours before the planned departure time. If ATC in the departure jurisdiction requires flight plan submission earlier than 3 hours prior, the SAPT for backup surveillance should be run just prior to flight plan submission. Under Exemption No. 12555, operators may elect their own tool for preflight prediction and use SAPT only to determine the availability of backup surveillance when needed under Exemption No. 12555.

NOTE: Some GPS receivers manufactured with a TSO-C129a approval are SA-Aware, and, therefore, have the same NACp and NIC availability as TSO-C196() approved equipment. Operators should check with their GPS receiver supplier to verify whether their installed TSO-C129() GPS receiver is SA-On or SA-Aware.

Note: Refer to AC 90-114A CHG 1, section 4-5c.(1) for determination of backup surveillance availability during a predicted GPS service disruption.

Table 1-1

Preflight Availability Prediction?			
Equipment	Years 2020 – 2024		After 2024
	Exemption 12555	No Exemption	
SA-On	Yes SAPT will determine backup surveillance and exemption authorizes flight if prediction results in NIC <7 and/or NACp<8.	Yes If prediction results in NIC <7 and/or NACp < 8, operator should re-plan the flight or request ATC authorization.	Yes If prediction results in NIC <7 and/or NACp < 8, operator should re-plan the flight or request ATC authorization.
SA-AWARE	No Exemption authorizes flight without the need for preflight prediction.	Yes If prediction results in NIC <7 and/or NACp < 8, operator should re-plan the flight or request ATC authorization.	Yes If prediction results in NIC <7 and/or NACp < 8, operator should re-plan the flight or request ATC authorization.
SBAS/ABAS	No	No	No

d. Preflight prediction compliance. Operators need to perform an ADS-B Out preflight prediction only for the intended route of flight to the intended destination. For example, when departure and/or arrival alternate airports are required, no preflight prediction is necessary for these routes. However, if you become aware of a change that could result in degraded ADS-B Out performance, such as a satellite outage prior to receiving an ATC clearance for the intended route of flight, then you should conduct a subsequent preflight prediction for the planned flight to ensure that ADS-B Out performance is still predicted to comply with the performance requirements of § 91.227(c)(1)(i) and (iii). Once the pilot has received an ATC route clearance, there is no requirement to conduct a subsequent preflight prediction. Therefore, upon receiving a satisfactory preflight availability prediction and an ATC clearance for an intended route of flight, the operator will be deemed to have complied with the preflight availability prediction requirement and the performance requirements of § 91.227(c)(1)(i) and (iii). The FAA accepts that unanticipated changes in route of flight and environmental conditions may adversely affect ADS-B Out performance. ATC will continue to exercise its responsibility for the safe and efficient movement of air traffic, including the routing of traffic to meet those objectives.

- ADS-B preflight planning should include:
- Identification of flights or aircraft that require completion of a preflight prediction.
 - Identify the preflight prediction system (or systems) to be used.
 - Include a means to document completion of a satisfactory prediction for each flight where a prediction is required.
 - Retain documentation of prediction completion for a suitable period of time, such as three months.

e. GPS Interference. There may be times when the GPS position source cannot meet the required technical performance due to planned GPS interference. In the event of a scheduled interference outage of GPS, the FAA will issue a Notice to Airmen (NOTAM) that identifies the airspace and time periods that may be affected by the interference. The FAA has determined that it would be impractical and not in the public interest to require operators to avoid the affected area based on the chance that an otherwise compliant flight could experience GPS interference. Accordingly, operators should proceed with their intended operation if the only impediment to their operation is possible planned GPS interference. An operator who is required to perform a preflight availability prediction for the intended route of flight is still required to obtain a satisfactory preflight availability prediction. When a NOTAM identifies the airspace and time periods that may be affected by GPS interference, an operator will not be required to alter his or her route of flight to avoid the area based solely on that NOTAM. If an operator encounters actual GPS interference during their flight that results in a degradation of ADS-B Out performance, the FAA will not consider these events to constitute noncompliance with § 91.227.

f. SAPT Outages. The FAA will issue a NOTAM in the event of a SAPT outage. Operators who use SAPT as their preflight prediction tool will not need to conduct a preflight prediction for the duration of the outage. When there is a SAPT outage, the FAA will not initiate compliance or enforcement actions against operators who rely on the SAPT if an operation falls below the performance requirements, despite the technical non-compliance with § 91.227. The FAA cautions that, for operators who have been notified by the FAA of consistent and repeated ADS-B Out performance issues, operating during SAPT outage without first redressing the identified non-performance issue will be considered a continuation of existing non-compliance of the performance requirements.

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