

# NOTICE

U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION

N 8900.231

National Policy

Effective Date:  
8/30/13

Cancellation Date:  
8/30/14

## **SUBJ:** Certificate of Waiver for an Aviation Event – Air Race

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**1. Purpose of This Notice.** This notice addresses revised performance standards for the design of an air race course for closed-course pylon air racing events conducted under Federal Aviation Administration (FAA) Form 7711-1, Certificate of Waiver for an Aviation Event. This notice provides guidance and policy to aviation safety inspectors (ASI) who issue a Certificate of Waiver for an Aviation Event – Air Race, who participate in the accreditation of an air race organization or race class, or who may also oversee an air race conducted under FAA Form 7711-1. Additionally, this notice will address the requirements for documentation of testing race aircraft after major changes or alterations are done prior to the air race, or maintenance conducted during the air race, to ensure that the race aircraft operated on the FAA-approved racecourse are in compliance with the operating limitations. These changes further address the National Transportation Safety Board (NTSB) recommendations A-12-14, A-12-13, A-12-10, and A-12-08.

**2. Audience.** The primary audience for this notice is Flight Standards District Office (FSDO) ASIs who issue a Certificate of Waiver for an Aviation Event – Air Race, ASIs who participate in the accreditation of an air race organization or race class, and ASIs who also oversee air races conducted under FAA Form 7711-1. The secondary audience includes the Flight Standards branches and divisions in the regions and headquarters (HQ).

**3. Where You Can Find This Notice.** You can find this notice on the MyFAA employee Web site at [https://employees.faa.gov/tools\\_resources/orders\\_notices](https://employees.faa.gov/tools_resources/orders_notices). Inspectors can access this notice through the Flight Standards Information Management System (FSIMS) at <http://fsims.avs.faa.gov>. Operators and the public may find this information on the FAA's Web site at <http://fsims.faa.gov>.

**4. Background.** The Reno Air Race Association (RARA), an FAA-accredited air race organization, in coordination with the FAA accreditation team, has requested that the FAA approve their new racecourses for all race classes using criteria that meet performance-based criteria agreed upon by the FAA and further addresses NTSB safety recommendation A-12-14. This notice addresses changes for approval of an air race waiver based on performance.

**a. Documentation.** Additionally, this notice outlines new policy that has been developed to address NTSB recommendations A-12-13 and A-12-10 by establishing requirements for

documentation of testing race aircraft after major changes or alterations are conducted prior to an air race, or maintenance conducted during an air race, to ensure that the race aircraft is operated in compliance with operating limitations. These policy changes are a step toward addressing all the corrections needed to reconcile the differences identified in NTSB safety recommendation A-12-08.

**b. Current Policy.** Current policy addressing an air race organization seeking approval for a racecourse design for a closed course racecourse must comply with the design requirements established in FAA Order 8900.1, Volume 3, Chapter 6, Section 2. Current policy is prescriptive rather than performance based. Performance-based design criteria allows for greater flexibility while still ensuring the intended level of safety is met.

**5. Policy Changes Addressing Race Course Design.** To address the RARA request and the NTSB recommendations, and to ensure an acceptable level of safety, the FAA is establishing new policy with performance-based criteria. These performance-based criteria are used in conjunction with the existing formulas established in FAA policy to set the safety distances for a closed-course pylon racecourse.

**a. Paragraph Changes.** Inspectors should note that the following paragraphs in Order 8900.1, Volume 3, Chapter 6, Section 2, will be changed to the following:

(1) Racecourse Design (Subparagraph 3-172A1), A satisfactory pylon air race course design involves the shape of the course and its relationship to the area around the course, especially the spectator areas. These factors depend upon the maximum speed of the racing aircraft, the maximum altitude of the racing aircraft, and the maximum g-loading (acceleration forces) that the aircraft are expected to encounter when flying the racecourse in a normal manner.

(2) Maximum g-Loading (Subparagraph 3-172A2)b). The maximum g-loading for a race aircraft flying the course in a normal manner must be set for each racecourse design. The maximum g- loading must be clearly documented on each racecourse submitted for FAA approval. In actual racing, where maneuvering and turbulence is encountered, momentary g-loadings in excess of this figure are acceptable.

(3) Minimum Turn Radius (Subparagraph 3-172 A2)c)). The speed and g-loadings permit the calculation of the minimum radius turn that should be permitted in the design of the racecourse. The formula for the turn radius for a given g-loading and speed is shown below.

(4) Racecourse Show Line (Subparagraph 3-172A3)). During the race, aircraft occupy a raceway around the racecourse. The edge of this raceway closest to the spectator area is the show line, over which no aircraft is permitted to cross while racing.

(5) Racecourse Width (Subparagraph 3-172 A3)a)). The raceway width may vary in the various racing classes so that the aircraft may pass one another. Criteria for passing aircraft during a sanctioned race or pylon racing school are established in accordance with the FAA accredited or recognized Air Race Operations Manual/Rules of Competition. The critical requirement is that no racing aircraft is permitted to cross over the show line during the race.

(6) Scatter Distance and Maximum Racecourse Altitude(s) (Subparagraph 3-172A3)c)1). The maximum racecourse altitude will be based on course design as it relates to scatter distance with a 50 percent safety factor. Any altitude flown below the computed maximum altitude should be acceptable. The scatter distance is the theoretical straight-line distance to a point on the ground that the debris will follow (ignoring air resistance), depending upon aircraft speed and altitude. The critical requirement is that no racing aircraft is permitted to cross over the show line during the race. A maximum racing altitude(s) is required to be established for each racecourse design and must be clearly documented on each racecourse submitted for FAA approval. The scatter distance formula for each racing class is shown below.

**Scatter Distance Formula \***

$$S = V \times \sqrt{\frac{2 \times A}{32.2}}$$

S = Scatter distance (feet)

V = Aircraft speed in ft/sec

(V = knots x 1.689)

A = Maximum aircraft altitude (AGL)

32.2 = Acceleration of gravity (ft/sec<sup>2</sup>)

**b. Altitude Deviations.** Limited deviations above the maximum race altitude can be encountered if such maneuvering is deemed to be in the interest of flying safety by the pilot in command (PIC), and judged to be so for that reason after review in accordance with the FAA-accredited or FAA recognized air race operations manual/rules of competition. In the interest of safety, such altitude deviations may be followed by a safe return to the racecourse. Reasons for maneuvering above the maximum race altitude include, but are not limited to, maneuvering out of the jet/prop wash or wake turbulence, as required for safe passing due to an unforeseen change in position of the aircraft being passed, or due to momentary loss of situational awareness (SA). A planned excursion from above the maximum altitude solely for the purpose of passing is not acceptable.

**6. Policy Changes Addressing Aircraft Demonstration, Major Changes or Alterations, and Maintenance During an Air Race.** Prior to being approved to race by the air race organization(s), in accordance with the procedures established in the FAA-accredited or FAA-recognized air race operations manual/rules of competition, the race pilot must establish with the air race organization(s) the race aircraft will be operated in compliance with any operating limitations. All race aircraft must be designed to acceptable structural design criteria to meet the limiting load factors as specified by the appropriate race class.

**Note:** Per Title 14 of the Federal Code of Regulations (14 CFR) part 91, § 91.3, the PIC of an aircraft is directly responsible for, and is the final authority as to, the operation of that aircraft.

**a. Requirements.** As required by the air race operations manual/rules of competition, a flight flutter analysis, test plan, and test results will be submitted to verify that the aircraft will safely operate within the structural limits and not be in the flutter region at anticipated race speeds and load factors within the anticipated race flight envelope. When required, the geographically responsible FSDO will ensure that the proposed engineering evaluation, including flight demonstrations and analysis within the anticipated flight envelope for the aircraft, will meet the eligibility requirements for the air race.

**b. Primary Race Pilots.** All primary race pilots must submit a written certification to the air race organization(s) stating that the intended race aircraft has demonstrated a true airspeed of 105 percent of its projected qualifying speed, while demonstrating a turn capability of 150 percent of the approved racecourse maximum designed g-load of his/her race class, prior to being eligible to race. During qualification, any aircraft that exceeds this speed will be required to demonstrate a true airspeed of 105 percent of the new qualifying speed, while demonstrating a turn capability of 150 percent of the approved racecourse maximum designed g-load. The primary race pilot must submit a new written certification prior to being permitted on the racecourse.

**Note:** Alternate race pilots must certify they accept the primary race pilot's flight demonstration certification or submit a new certification prior to being permitted on the racecourse.

**c. Flight Data.** The air racing flight demonstration specified in the written certification may be based on historic flight data (e.g., a previous air race) for the same aircraft/primary pilot combination, if the aircraft has received no major changes or alterations after the flight demonstration date.

**d. Certification of Demonstration.** The following statement (Figure 1, Air Racing Flight Demonstration) will be provided to the air race organization and retained by both the air race pilot and the air race organization as a record of accomplishment prior to being permitted on the racecourse.

**Figure 1. Air Racing Flight Demonstration**

I certify that I have completed an air racing flight demonstration in [insert registration number/serial number] at a true airspeed of [insert speed] with a turning g-load of [insert g-load], and have found the aircraft has no hazardous characteristics or design features and is safe for air race operations. These parameters establish the race aircraft has demonstrated a true airspeed of 105 percent of its projected qualifying speed while demonstrating a turn capability of 150 percent of the approved racecourse maximum designed g-load of the [insert applicable race class] race class.

This aircraft has received no major changes or alterations after the flight demonstration date.

Flight Demonstration Date: \_\_\_\_\_

Primary Race Pilot Name \_\_\_\_\_

Signature \_\_\_\_\_ Date \_\_\_\_\_

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Alternate Race Pilot(s) Name \_\_\_\_\_

I accept the conditions of the above statement \_\_\_\_\_ Date \_\_\_\_\_

Signature \_\_\_\_\_

**7. Flight-Critical Aircraft Maintenance.** Any flight-critical aircraft maintenance performed during a race (e.g., engine change, cylinder change, or flight control removal/replacement) will be documented, reinspected, and validated in accordance with the procedures established in the FAA-accredited or FAA-recognized air race operations manual/rules of competition to ensure that the affected aircraft is once again in a condition for safe flight before recommencing race operations.

**a. Active Log.** Each race class will be required to keep an active log that identifies those flight-critical corrective actions initiated and/or completed on each race aircraft in the class. The log will include the aircraft race number, date/time, the discrepancy discovered, and the corrective action taken place or in progress. The logs will be retained by the race class and made available to the race organization and FAA to review daily during air races and to support any incident/accident investigation.

**b. FAA Form 7711-1.** The FAA Form 7711-1 issued for the air race must include special provision (s) requiring compliance with the FAA-accredited or FAA-recognized air race operations manual/rules of competition. These new special provisions will state:

(1) The rules of competition manual is depicted and described on attachment # [insert number] of this Certificate of Waiver and becomes a special provision thereof. Any action contrary to the terms, controls, procedures, and conditions pertaining to safety set forth in the FAA-approved procedures, is grounds for cancellation of this waiver.

(2) The maximum number of aircraft listed in the rules of competition manual attachment # [insert number] for each FAA-approved racecourse shall not be exceeded.

(3) The maximum altitude listed for each FAA-approved racecourse in attachment # [insert number] shall not be exceeded, except as authorized in the rules of competition manual attachment # [insert number].

(4) Prior to the event, the primary race pilot must submit written certification to the race organization [Insert name], establishing the race aircraft has demonstrated a true airspeed of 105 percent of its projected qualifying speed while demonstrating a turn capability of 150 percent of the approved racecourse maximum designed g-load of the applicable race class. This aircraft has received no major changes or alterations after the flight demonstration date.

(5) Any flight-critical aircraft maintenance performed during the race (e.g., engine change, cylinder change, or flight control removal/replacement) will be documented and reinspected as authorized in the rules of competition manual attachment # [insert number] and the [insert FSDO] to ensure that the affected aircraft is once again in a condition for safe flight before recommencing race operations. Each race class is required to keep an active log that identifies those flight critical corrective actions initiated/completed on each race aircraft in the class.

**Note:** The list of all special provisions can be found online at:  
<http://www.faa.gov/about/initiatives/airshow/waiver/>.

**8. Disposition.** We will incorporate the policy information in this notice into FAA Order 8900.1, Flight Standards Information Management System (FSIMS), and other applicable FAA guidance. Direct general questions concerning this notice either to Sue Gardner, the General Aviation Operations Branch (AFS-830), at 847-294-7970 or [sue.gardner@faa.gov](mailto:sue.gardner@faa.gov); or to David Keen, the General Aviation Branch (AFS 350), at 202-385-6502 or [david.keen@faa.gov](mailto:david.keen@faa.gov).

for

  
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Director, Flight Standards Service