



[4910-13]

**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

**14 CFR Part 23**

[Docket No.FAA-2017-0651; Notice No. 23-17-02-SC]

**Special Conditions: Game Composites Ltd, GB1 airplane; Acrobatic Category Aerodynamic Stability.**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Notice of proposed special conditions.

**SUMMARY:** This action proposes special conditions for the Game Composites Ltd. GB1 airplane. This airplane will have a novel or unusual design feature(s) associated with static stability. This airplane can perform at the highest level of aerobatic competition. To be competitive, the airplane is designed with its lateral and directional axes being decoupled from each other; providing more precise maneuvering. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for this design feature. These proposed special conditions contain the additional safety standards the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

**DATES:** Send your comments on or before **[insert a 30 days after date of publication in the Federal Register]**.

**ADDRESSES:** Send comments identified by docket number FAA-2017-0651 using any of the following methods:

- Federal eRegulations Portal: Go to <http://www.regulations.gov> and follow the online instructions for sending your comments electronically.

- Mail: Send comments to Docket Operations, M-30, U.S. Department of Transportation (DOT), 1200 New Jersey Avenue, SE., Room W12-140, West Building Ground Floor, Washington, D.C., 20590-0001.
- Hand Delivery of Courier: Take comments to Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, S.E., Washington, D.C., between 9 a.m., and 5 p.m., Monday through Friday, except Federal holidays.
- Fax: Fax comments to Docket Operations at 202-493-2251.

Privacy: The FAA will post all comments it receives, without change, to <http://regulations.gov>, including any personal information the commenter provides. Using the search function of the docket web site, anyone can find and read the electronic form of all comments received into any FAA docket, including the name of the individual sending the comment (or signing the comment for an association, business, labor union, etc.). DOT's complete Privacy Act Statement can be found in the Federal Register published on April 11, 2000 (65 FR 19477-19478), as well as at <http://DocketsInfo.dot.gov>.

Docket: Background documents or comments received may be read at <http://www.regulations.gov> at any time. Follow the online instructions for accessing the docket or go to the Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE., Washington, D.C., between 9 a.m., and 5 p.m., Monday through Friday, except Federal holidays.

**FOR FURTHER INFORMATION CONTACT:** Mr. Ross Schaller, Federal Aviation Administration, Small Airplane Directorate, Aircraft Certification Service, 901 Locust; Kansas City, Missouri 64106; telephone (816) 329-4162; facsimile (816) 329-4090.

## **SUPPLEMENTARY INFORMATION:**

### **Comments Invited**

We invite interested people to take part in this rulemaking by sending written comments, data, or views. The most helpful comments reference a specific portion of the special conditions, explain the reason for any recommended change, and include supporting data. We ask that you send us two copies of written comments.

We will consider all comments we receive on or before the closing date for comments. We will consider comments filed late if it is possible to do so without incurring expense or delay. We may change these special conditions based on the comments we receive.

### **Background**

On March 10, 2014, Game Composite Ltd. applied for a type certificate for their new GB1 airplane. The GB1 is a single-engine airplane with a two-place tandem canopy cockpit. It features conventional landing gear, conventional low-wing planform, and is mostly constructed of carbon composite materials. The engine is a Lycoming AEIO-580-B1A, fitted with a model MTV-14-B-C/C190-130 4-blade MT-propeller. The airplane will be approved for Day-VFR operations (non-icing). The maximum takeoff weight is 2,200 pounds in acrobatic category with a maximum operating altitude of 15,000 feet. The never exceed speed ( $V_{NE}$ ) is 230 knots, the design cruise speed ( $V_C$ ) is 200 knots, and the design maneuvering speed ( $V_A$ ) is 175 knots.

Acrobatic airplanes previously type certified by the FAA did comply with the stability provisions of part 23, subpart B. However, airplanes like the GB1 are considered as “unlimited” acrobatic airplanes because these airplanes can perform all the maneuvers listed in the Aresti Catalog. Generally, the evolution of the “unlimited” types of acrobatic airplanes, with very low mass, exceptional roll rates, and very high G capabilities—in addition to power to mass ratios—

are unique to this type of airplane and have led to airplanes that cannot comply with the stability provisions of the regulations. These airplanes can be type certified in the acrobatic category only with an appropriate set of special conditions and associated limitations.

### **Type Certification Basis**

Under the provisions of 14 CFR § 21.17, Game Composites Ltd. must show the GB 1 meets the applicable provisions of part 23, as amended by amendments 23-1 through 23-62 thereto.

If the Administrator finds that the applicable airworthiness regulations (i.e., 14 CFR part 23) do not contain adequate or appropriate safety standards for the GB1 because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

Special conditions are initially applicable to the model for which they are issued. Should the type certificate for that model be amended later to include any other model that incorporates the same or similar novel or unusual design feature, the FAA would apply these special conditions to the other model under § 21.101.

In addition to the applicable airworthiness regulations and special conditions, the GB1 must comply with the fuel vent and exhaust emission requirements of 14 CFR part 34 and the noise certification requirements of 14 CFR part 36 and the FAA must issue a finding of regulatory adequacy under § 611 of Public Law 92-574, the "Noise Control Act of 1972."

The FAA issues special conditions, as defined in 14 CFR 11.19, in accordance with § 11.38, and they become part of the type-certification basis under § 21.17(a)(2).

### **Novel or Unusual Design Features**

The GB1 airplane will incorporate the following novel or unusual design features:

For acrobatic category airplanes with unlimited acrobatic capability:

Relaxed longitudinal and decoupled lateral static stability characteristics

### **Discussion**

Sections 23.173 and 23.177 provide static stability criteria for longitudinal, lateral, and directional axes requirements for an airplane. However, these requirements are not adequate to address the specific issues raised in the flight characteristics of an unlimited aerobatic airplane. Therefore, the FAA has determined special conditions are needed—after a flight-test evaluation—to address the static stability characteristics of the GB1. Accordingly, these special conditions are for the Game Composites Ltd. GB1 airplane’s static stability characteristics.

### **Applicability**

As discussed above, these special conditions are applicable to the GB1. Should Game Composites Ltd. apply at a later date for a change to the type certificate to include another model incorporating the same novel or unusual design feature the FAA would apply these special conditions to that model as well.

### **Conclusion**

This action affects only certain novel or unusual design features on one model of airplane. It is not a rule of general applicability.

### **List of Subjects in 14 CFR Part 23**

Aircraft, Aviation safety, Signs and symbols.

The authority citation for these special conditions is as follows:

**Authority:** 49 U.S.C. 106(f), 106(g), 40113, 44701, 44702, 44704.

## **The Proposed Special Conditions**

Accordingly, the Federal Aviation Administration (FAA) proposes the following special condition as part of the type certification basis for Game Composites GB1 airplanes.

### **1. Acrobatic Only Category Static Stability Requirements.**

- a. In place of 14 CFR 23.173, “Static longitudinal stability,” comply with the following:

#### **SC23.173 Static longitudinal stability**

Under the conditions in 14 CFR 23.175 and with the airplane trimmed as indicated, the characteristics of the elevator control forces and the friction within the control system must be as follows:

- (a) A pull must be required to obtain and maintain speeds below the specified trim speed and a push required to obtain and maintain speeds above the specified trim speed. This must be shown at any speed that can be obtained, except that speeds requiring a control force in excess of 40 pounds or speeds above the maximum allowable speed or below the minimum speed for steady unstalled flight need not be considered.

- (b) The stick force or position must vary with speed so any substantial speed change results in a stick force or position clearly perceptible to the pilot.

- b. In place of 14 CFR 23.177, “Static directional and lateral stability,” comply with the following:

#### **SC23.177 Static directional and lateral stability:**

- (a) The static directional stability, as shown by the tendency to recover from a wings level sideslip with the rudder free, must be positive for any landing gear and flap position appropriate to the takeoff, climb, cruise, approach, and landing configurations. This must be

shown with symmetrical power up to maximum continuous power and at speeds from  $1.2 V_{S1}$  to  $V_O$  (maximum operating maneuvering speed); the rudder pedal force must not reverse.

(b) In straight, steady slips at  $1.2 V_{S1}$  for any landing gear and flap positions and for any symmetrical power conditions up to 50 percent of maximum continuous power, the rudder control movements and forces must increase steadily—but not necessarily in constant proportion—as the angle of sideslip is increased up to the maximum appropriate for the type of airplane. The aileron control movements and forces may increase steadily, but not necessarily in constant proportion, as the angle of sideslip is increased up to the maximum appropriate for the type of airplane. At larger slip angles, up to the angle at which full rudder or aileron control is used or a control force limit contained in 14 CFR 23.143 is reached, the aileron and rudder control movements and forces must not reverse as the angle of sideslip is increased. Rapid entry into—and recovery from—a maximum sideslip considered appropriate for the airplane must not result in uncontrollable flight characteristics.

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Aircraft

Certification

Service

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