



Civil Aviation Authority
SAFETY DIRECTIVE
Number: SD-2021/004



Issued: 21 September 2021

Non-Part 21 Amateur-Built Balloon and Airship Operational Limitations

At Section 3 to this Safety Directive is an Operational Directive mandating action required to maintain an acceptable level of safety. The Operational Directive is issued in accordance with Article 248 of the Air Navigation Order 2016.

Recipients must ensure that this Directive is copied to all members of their staff who need to take appropriate action or who may have an interest in the information (including any 'in-house' or contracted maintenance organisation and relevant outside contractors).

Applicability:	
Aerodromes:	Not affected
Air Traffic:	Not affected
Airspace:	Not affected
Airworthiness:	Not affected
Flight Operations:	Operators of amateur-built airships and balloons to which the Directive applies
Licensed Personnel:	All pilots of non-Part 21 amateur-built balloons and airships

1 Introduction

- 1.1 This Safety and Operational Directive contains mandatory action that is required to maintain an acceptable level of safety. It is issued under article 248 of the Air Navigation Order 2016 ("the Order"). Recipients must ensure that this Directive is copied to all relevant individuals who may have an interest in the information. This Directive is applicable to operators of non-Part 21 amateur-built balloons and airships.
- 1.2 Non-Part 21 aircraft are defined in Schedule 1 to the Order as "an aircraft which is not required by the Basic Regulation and any regulations made in accordance with that Regulation to hold a Part-21 certificate of airworthiness, a Part-21 restricted certificate of airworthiness or a Part-21 permit to fly; and "non-Part-21 balloon" [is] to be construed accordingly". Such aircraft are those listed in Annex I of Regulation (EU) No 2018/1139 (the 'Basic Regulation') as retained (and amended in UK domestic law) under the European Union (Withdrawal) Act 2018. This includes amateur-built aircraft, including those supplied in kit form, where at least 51% of the fabrication and assembly tasks are performed by an amateur, or a non-profit making association of amateurs, for their own purposes and without any commercial objective. These aircraft have always been exempt from regulation under the Basic Regulation, including in particular their airworthiness.

2 Background

- 2.1 There has been a noticeable increase in the number of amateur-built hot-air balloons on the UK register in recent years and there are now several such balloons capable of carrying at least four people. Although the CAA has not seen the same increase in the number of amateur-built airships, these types are nevertheless included in this Directive as it is recognised that balloons can be readily converted to airships by adding propelling and steering means. Therefore, to ensure the limitations introduced via this Directive are not circumvented, the CAA has made it applicable to both balloons and airships that are amateur built.
- 2.2 Unlike other amateur-built aircraft types capable of carrying multiple people, amateur-built balloons and airships are not currently regulated with respect to airworthiness and there is no airworthiness assurance system in place for them (e.g. Permit to Fly). In comparison, factory-built balloons can be unregulated with respect to airworthiness only up to 42,377 cu. ft. (1200 m³).
- 2.3 Over 70% of all amateur-built balloons on the UK register have been added in the last six years and there are now several balloons with 90,000 cu. ft. (approximately 2550 m³) envelopes, capable of carrying at least four people.
- 2.4 The CAA has not seen the need to introduce airworthiness regulation for amateur-built balloons and airships while they remained small in both size and quantity. However, the recent increase in the quantity of multi-occupancy amateur-built balloons has given the CAA cause to re-evaluate our national policy in this regard. Furthermore, the CAA has received multiple inquiries from individuals interested in building balloons larger than 90,000 cu. ft., further reinforcing the noted trend of amateur-built balloons becoming larger.
- 2.5 In assessing risk, both the probability and severity of an accident/incident are taken into account. Assuming the probability of an accident/incident remains constant with aircraft size, the severity of an accident/incident increases with aircraft size as more people are potentially involved. Based on the recent increase in the quantity of multi-occupancy amateur-built balloons, this Directive introduces limits on amateur-built [airship and] balloon private operations that will remain valid until such time as a proportionate airworthiness assurance system for these types is considered.
- 2.6 In developing this Directive, the CAA has sought a balance between safety and operational freedom. The views of the British Balloon and Airship Club (BBAC) and other active members of the UK ballooning community were taken into consideration. Furthermore, the CAA recognises the strong safety record that UK operators of balloons and airships have built up over many years and this has been taken into consideration. All amateur-built balloons and airships on the UK register will be able to continue operating on their current basis, but will be limited to a maximum occupancy of four people, including the pilot. Based on the size of the largest amateur-built balloons and airships currently on the UK register, this operational limitation is deemed to have minimal impact. Furthermore, amateur-built balloons and airships will be limited to a maximum envelope size of 90,000 cu. ft. (approximately 2550 m³). No amateur-built balloons or airships currently on the UK register will be adversely impacted by this size limit. These size and occupancy limits will remain in place until such time as a CAA/balloon community collaborative working group determines whether an airworthiness assurance system is required and in what form.
- 2.7 In determining an appropriate occupancy limit for amateur-built balloons and airships, the CAA considered both the size and safety record of the balloons/airships currently on the UK register and compared these with other amateur-built GA types used for non-commercial activity. With the exception of some single-seat platforms (e.g. Single-Seat Deregulated aeroplanes and Self-Propelled Hang Gliders), a Permit to Fly is required for all amateur-built types. For amateur-built aeroplanes, a four-seat limit is specified in CAP 659, paragraph 3.2.1. The four-seat limit is further reinforced by the fact that organisations supporting recreational aviation are currently

limited to a four-seat maximum. Taking into account the aforementioned factors, it is considered that a four-person occupancy limit for amateur-built balloons and airships that have no airworthiness assurance system represents a reasonable compromise that mitigates the risk while still allowing people to continue to enjoy building and flying balloons and sharing their hobby with others.

- 2.8 This Directive is a proactive measure to proportionately mitigate risk until such time as a CAA/balloon community collaborative working group delivers an outcome on the consideration of a proportionate airworthiness assurance system.

3 Operational Directive

- 3.1 The Civil Aviation Authority (CAA), in exercise of its powers under Article 248 of the Air Navigation Order 2016 directs operators of any non-Part 21 amateur-built balloon or airship which is:

- (a) registered in the United Kingdom; or
- (b) registered other than in the UK and intending to conduct flights within UK airspace¹, to comply with the requirements set out in paragraph 3.2.

- 3.2 Operators of non-Part 21 amateur-built balloons or airships are:

- limited to carrying a maximum of four occupants (pilot plus three passengers), while respecting occupancy and Maximum Take-Off Mass (MTOM) limitations stated in the Flight Manual (FM) or Pilot's Operating Handbook (POH) and;
- limited to flying balloons and airships with a maximum design volume of 90,000 cu. ft. (approximately 2550 m³).

4 Queries

- 4.1 Any queries or requests for further guidance as a result of this communication should be addressed to FSTechnicalSupportTeam@caa.co.uk.

5 Cancellation

- 5.1 This Directive will remain in force unless revoked by the CAA.

Signed: ...Michael Macdonald...

Date: ...21/09/2021...

¹ These balloons require a foreign aircraft exemption to permit flight in UK airspace. Details on how to apply can be found [here](#).