

## HOT-AIR BALLOON AWARENESS.

### 1 Introduction

1.1 Commercial ballooning has grown rapidly in the United Kingdom since the introduction of a UK Commercial Pilot's Licence for balloons in 1988 and the associated public transport standards for ballooning. To allow the carriage of paying passengers, the CAA issues an Air Operator's Certificate (AOC) to balloon operators meeting and maintaining such standards.

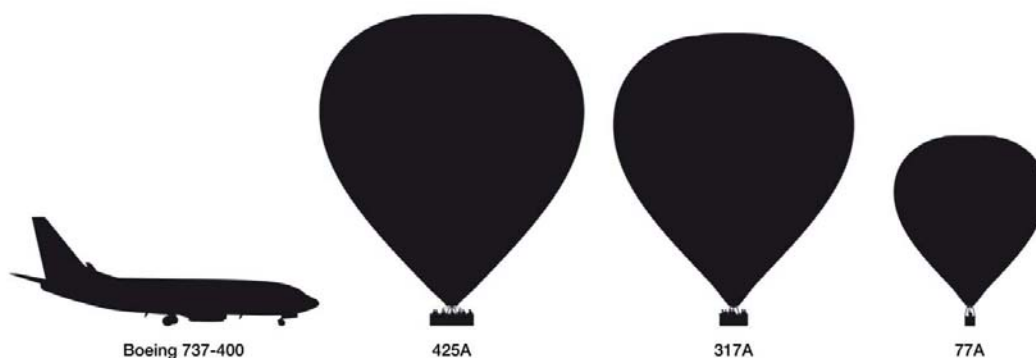
1.2 Under the civil Rules of the Air Regulations 2007 or military Regulatory Publications, all aircraft give way to balloons and this AIC gives other airspace users and air traffic controllers information on the scale of the activity in the UK and some of the operating criteria for passenger balloon flights.

### 2 Scale of Activity

- There are currently 42 operators holding an AOC (Balloons), operating 220 public transport balloons in the UK;
- 6,200 commercial balloon flights carrying 71,500 passengers were undertaken in the UK during 2011;
- There are additionally some 660 private or aerial work balloons with valid Certificates of Airworthiness in the UK.

### 3 Size

3.1 Some hot-air balloons are extremely large and other airspace users and air traffic controllers have sometimes experienced difficulties in gauging how far (laterally) away they are. The diagram below takes a silhouette of a Boeing 737-400 and places it alongside scale silhouettes of a 19-passenger 425,000 cubic feet balloon (the largest currently operated in the UK), a 16-passenger 317,000 cubic feet balloon (typical of many UK passenger balloons) and a 77,000 cubic feet balloon that is typically used for sporting and recreational flying and carries two passengers.



(diagram courtesy of Lindstrand Balloons Limited)

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## **4 Where**

4.1 Hot-air balloon flights can take place anywhere in the UK, but flight operations are most likely away from steep and rocky terrain and immediate coastal areas, and usually outside controlled airspace. Activity is particularly high in the Bristol and Bath area and generally in the south of England, particularly in Essex, Surrey, Sussex and Kent. Balloons can launch from almost any suitable site with the landowner's permission and may launch from built-up areas with the additional prior permission of the CAA and from within controlled airspace with the additional prior permission of Air Traffic Control (ATC).

4.2 A public transport balloon is required to contact the appropriate ATC unit if its flight takes it within 3 NM horizontally and/or 1000 ft vertically of controlled airspace, unless there is a local agreement in effect, as is the case with Bristol ATC and with Norwich ATC.

## **5 When**

5.1 In order to fly in the most stable conditions and to avoid thermal activity, balloons are normally operated early in the morning and during the three hours prior to sunset during the summer period. It is possible to fly at any time during daylight hours on a calm winter's day. Commercial balloons are limited to day flying only and should land with reasonable daylight remaining. Very rarely, sporting and recreational balloon flights are made at night, but these are invariably planned to land after sunrise. Activity is higher at weekends and on public holidays and there are often organised balloon meets across the UK on summer weekends with up to 100 balloons flying at the larger events. Details of organised meets are usually promulgated by NOTAM.

5.2 Ballooning will normally occur under a stable air mass and all commercial balloon flights must be conducted under Visual Flight Rules (VFR) with, below 3000 ft, visibility of at least 3 km, clear of cloud and with the surface in sight. Within controlled airspace not subject to permanent Instrument Flight Rules (IFR) the required visibility is at least 5 km. Outside controlled airspace, non-commercial balloon flights conducted under VFR require a visibility of 1,500 m.

5.3 The surface wind limit is 15 kt for balloons to launch, but most flights are conducted when the surface wind speed is less than 8 kt.

## **6 How**

6.1 All balloons, unless in tethered flight, track downwind.

6.2 Commercial balloons often fly below 2000 ft, affording the best view for their passengers, but can be found up to FL 100. Flights commonly last for about one hour, but this can be extended considerably if a suitable landing site cannot be found on track. Fuel duration varies with the balloon size and conditions, but is normally between 1½ and 2 hours. The balloon will usually descend to low level for the last 15 to 20 minutes of the planned flight in order to assess the low level winds and to manoeuvre for landing. A pilot can 'steer' a balloon using the wind directions between the surface and the gradient wind direction, which may vary by 30° or more. This often occurs during early morning flights and the balloon may be seen to climb or descend rapidly to achieve such steerage.

6.3 During flight, a balloon may also descend towards points of interest, for example lakes. If a balloon is seen to be just touching the water it is probably not in any difficulty.

6.4 A balloon is most manoeuvrable when in equilibrium; neither climbing nor descending. Descent is achieved either by letting the hot air inside the balloon envelope cool naturally or by opening the parachute vent in the top of the envelope (which reseals once the control line is released). Operation of the vent will cause the balloon to descend rapidly until more hot air is added to arrest the descent. Normal descent rate is less than 600 ft per minute and a large passenger balloon will rarely exceed this below 2000 ft Above Ground Level (AGL) as it may not be possible to recover even with the use of all (up to four) burners. The manufacturer's stated limit for climbing and descending is between 800 and 1000 ft per minute - surprisingly quick - and a balloon in this mode of flight will usually be unable to reverse this climb or descent quickly and should be given a wide berth.

## **7 Communications**

7.1 Balloonists communicate with their retrieve teams and with other balloons on frequency 122.475 MHz in the UK, normally using hand-held radios. The same radios are used for ATC communications, when required. Some commercial balloons that are regularly operated in and around controlled airspace now carry a lightweight Mode-S transponder; however, Secondary Surveillance Radar (SSR) equipment is not yet commonplace in balloons.

## **8 Action for AOC Holders**

8.1 AOC holders should consider including some of the information contained in this circular in their Operation Manual.

## **9 Further Information**

9.1 See CAP 611 Air Operators' Certificates: Operation of Balloons ([www.caa.co.uk/cap611](http://www.caa.co.uk/cap611)) for more information.