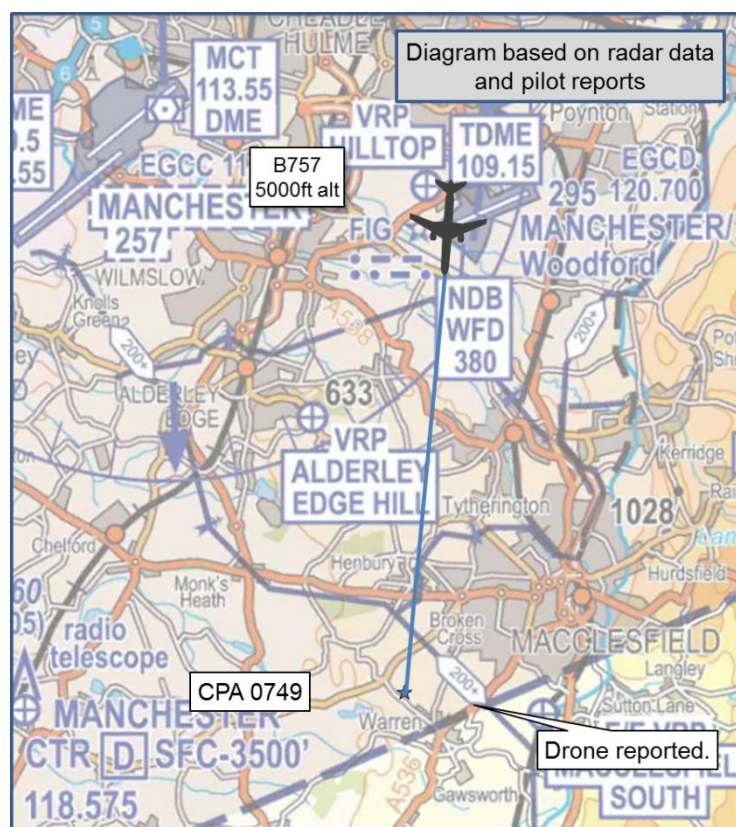


AIRPROX REPORT No 2015082

Date: 8 May 2015 Time: 0749Z Position: 5313N 00210W Location: Macclesfield

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	B757	UAV, Quadcopter
Operator	CAT	Unknown
Airspace	Manchester TMA	Manchester TMA
Class	A	A
Rules	IFR	NK
Service	Radar Control	NK
Provider	Scottish	NK
Altitude/FL	5000ft	
Transponder	A,C,S	
Reported		
Colours	Blue/White	Black
Lighting	Red and white strobes.	
Conditions	VMC	NK
Visibility	30km	
Altitude/FL	5000ft	4800ft
Altimeter	QNH (1014hPa)	NK
Heading	188°	NK
Speed	250kt	NK
ACAS/TAS	TCAS II	Not fitted
Alert	Nil	N/A
Separation		
Reported	150ft V	NK
Recorded		NK



THE B757 PILOT reports that they were following a standard instrument departure from Manchester, in good VMC, when the Captain, who was PM, spotted a black dot ahead, slightly left and slightly low. As he was trying to work out what it was, the dot bloomed into what looked like a black Quadcopter. With a closing speed of 250kts there was no time to react and the aircraft passed slightly above and to the right of the object. The first Officer also caught a glimpse of the object as they passed it, alerted by a call from the captain. It appeared that the object was flying just below 5000ft, but it was impossible to judge the size of the object or its distance as there was no frame of reference. The reported distances are based on the assumption that the object was 0.5-1m wide. The Airprox was immediately reported to Scottish Control, who indicated he could see something on the radar. The pilot reported that it was a very frightening incident; if the object had been displaced by 500m they would have hit it. He also noted that it happened very quickly, with the time from initial sighting to the object passing being around 2 seconds.

He assessed the risk of collision as 'Severe'.

THE QUADCOPTER OPERATOR could not be traced.

THE MANCHESTER CONTROLLER reports he was SE Tac controller and had a planner in place because it was expected that traffic levels were due to increase. The B757 was on a LISTO departure and reported a drone to his left-hand side at approximately 5000ft. The controller instructed the aircraft behind to turn in order to keep them clear of the reported drone.

Factual Background

The weather at Manchester was reported as:

METAR EGCC 080750Z 12007KT CAVOK 12/05 Q1014 NOSIG

The LISTO2S departure is published as shown in Figure 1.

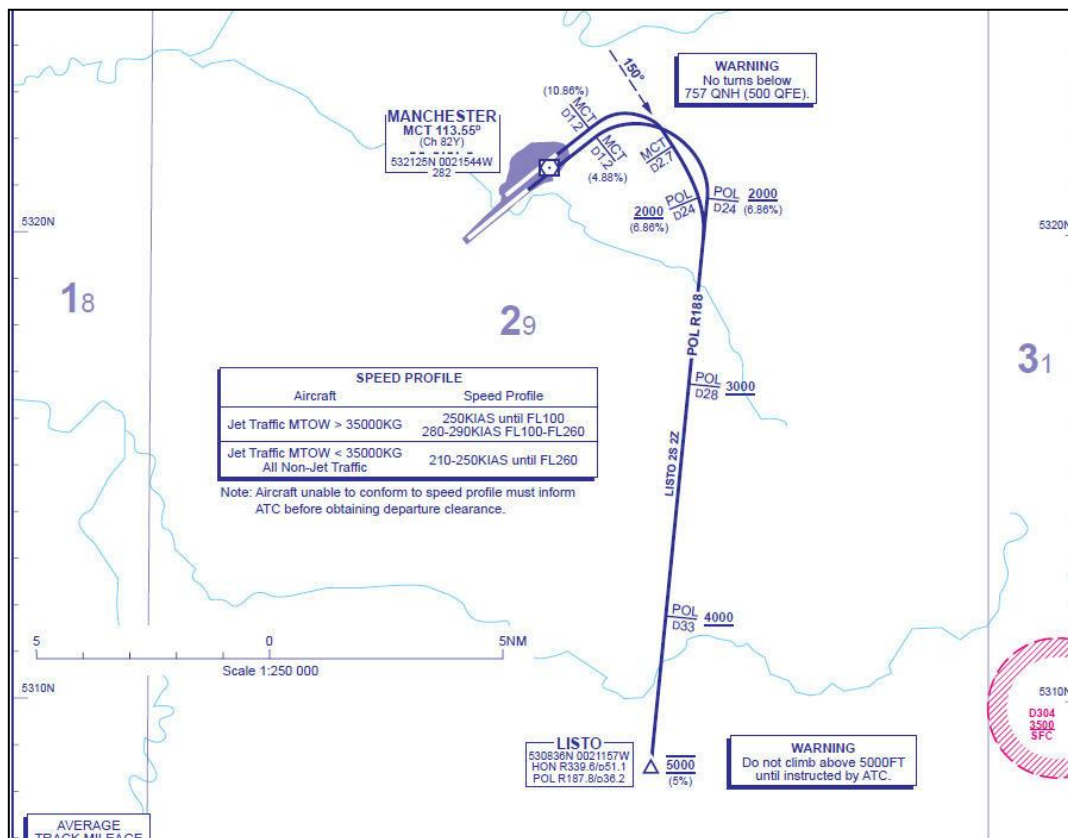


Figure 1: LISTO2S departure

Analysis and Investigation

CAA ATSI

Pilot of the B757 reported having seen a black quadcopter on his left-hand side at a similar level to himself (5000ft). The STAFA controller passed positional information to following aircraft and subsequently a turn to avoid. The report from the pilot of the B752 indicated that he believed that the controller could see the drone on his radar screen, but this was not the case. Positional information was passed to the following aircraft based on the position of the reporting aircraft at the time.

UKAB Secretariat

The Air Navigation Order 2009 (as amended), Article 138¹ states:

A person must not recklessly or negligently cause or permit an aircraft to endanger any person or property.

¹ Article 253 of the ANO details which Articles apply to small unmanned aircraft. Article 255 defines 'small unmanned aircraft'. The ANO is available to view at <http://www.legislation.gov.uk>.

Article 166, paragraphs 2, 3 and 4 state:

(2) The person in charge of a small unmanned aircraft may only fly the aircraft if reasonably satisfied that the flight can safely be made.

(3) The person in charge of a small unmanned aircraft must maintain direct, unaided visual contact with the aircraft sufficient to monitor its flight path in relation to other aircraft, persons, vehicles, vessels and structures for the purpose of avoiding collisions.’

(4) The person in charge of a small unmanned aircraft which has a mass of more than 7kg excluding its fuel but including any articles or equipment installed in or attached to the aircraft at the commencement of its flight must not fly the aircraft

(a) in Class A, C, D or E airspace unless the permission of the appropriate air traffic control unit has been obtained;

(b) within an aerodrome traffic zone ...; or

(c) at a height of more than 400 feet above the surface unless it is flying in airspace described in sub-paragraph (a) or (b) and in accordance with the requirements for that airspace.

A CAA web site² provides information and guidance associated with the operation of Unmanned Aircraft Systems (UASs) and Unmanned Aerial Vehicles (UAVs).

The CAA has published a UAV Safety Notice³ which states the responsibilities for flying unmanned aircraft. This includes:

You are responsible for avoiding collisions with other people or objects - including aircraft.

Do not fly your unmanned aircraft in any way that could endanger people or property.

It is illegal to fly your unmanned aircraft over a congested area (streets, towns and cities).

Also, stay well clear of airports and airfields.

In addition, the CAA has published guidance regarding First Person View (FPV) drone operations which limit this activity to drones of less than 3.5kg take-off mass, and to not more than 1000ft⁴.

Occurrence Investigation

NATS undertook an occurrence investigation, which noted that there was no radar contact correlating to the drone’s reported track and so exact distances could not be ascertained. The Cheshire police were informed about the incident.

Summary

An Airprox was reported on 8th May at 0749 between a B757 and a Quadcopter. The B757 was on a LISTO departure from Manchester and, when passing 5000ft, the crew reported seeing a Quadcopter type drone pass 500m down their left-hand side. The Quadcopter operator could not be traced.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from the B757 pilot, transcripts of the relevant RT frequencies, radar photographs/video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

The crew of the B757 reported seeing an drone-like object at 5000ft overhead Macclesfield. The Board noted that CAA regulation states that it is illegal for drones to be operated at that height and

² www.caa.co.uk/uas

³ CAP 1202

⁴ ORSA No. 1108 Small Unmanned Aircraft – First Person View (FPV) Flying available at: <http://www.caa.co.uk/docs/33/1108.pdf>.

drones must not be flown within controlled airspace, in this case the Manchester TMA, without prior approval and a NOTAM issued. The drone operator was not entitled to operate there, and his non-compliance posed a safety risk. Furthermore, to reach a height of 5000ft, the drone would need to be flown on first person view (FPV), and regulation states that, when using FPV, an additional person must be used as a competent observer who must maintain direct unaided visual contact with the drone in order to monitor its flight path in relation to other aircraft. At 5000ft it would be impossible to see the drone from the ground, again contrary to the regulation.

The Board heard evidence provided by ARPAS-UK⁵ would seem to suggest that it would be quite difficult for a consumer drone to reach heights of 5000ft, and it would therefore be more likely to be an expensive, high specification model of the type normally used by professionals. Even if the drone was able to reach 5000ft, ARPAS-UK suggested that battery life would preclude it remaining there for any length of time; the average battery life for a drone is 15 minutes when flying conservatively, and the Board understood that flying at height drained the battery even more quickly. This led the Board to wonder whether the crew could have seen something other than a drone. Notwithstanding, with both members of the flight crew having seen the object, the Board did not doubt that the crew had seen something at their level; that they were convinced that it looked like a black Quadcopter drone had to be taken at face value.

In determining the cause, because the drone was operating in airspace which it should not be in, the Board agreed the cause to be that the reported drone had been flown into conflict with the B757. Turning to the assessment of the risk some Board members wondered whether chance had played a major part in preventing a collision. However, although there was no radar recording to provide accurate separation data, given that the object was described as being 150ft vertically and 500m horizontally away, it was decided that this was a Category B risk rather than a Category A: safety margins had been much reduced below normal but not quite to the extent where separation had been reduced to the minimum.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The reported drone was flown into conflict with the B757.

Degree of Risk: B.

⁵ ARPAS-UK - Association of Remotely Piloted Aircraft Systems-UK.