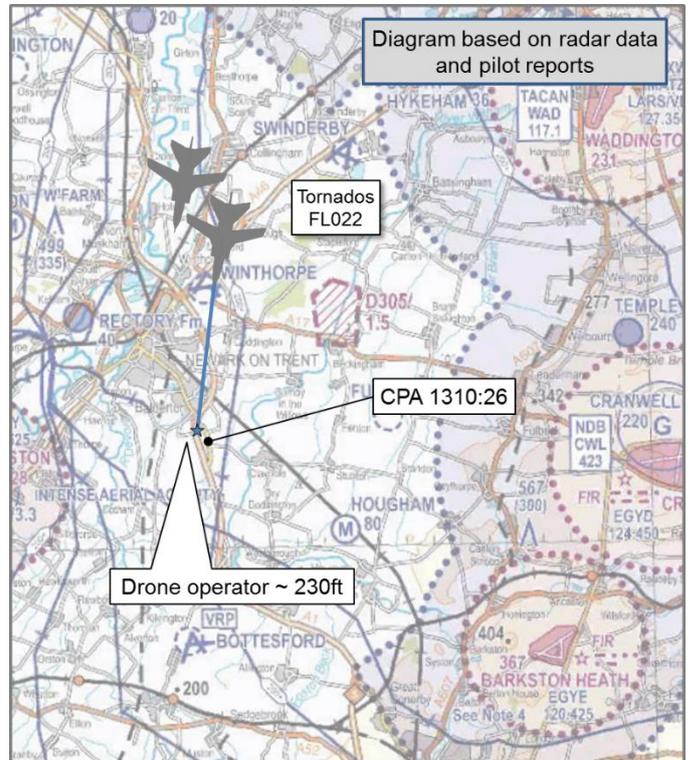


AIRPROX REPORT No 2017262

Date: 02 Nov 2017 Time: 1310Z Position: 5302N 00046W Location: Bantycok, Lincs

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	DJI Phantom	Tornado
Operator	Civ Pte	HQ Air (Ops)
Airspace	London FIR	London FIR
Class	G	G
Rules	ANO 2016	VFR
Service		Deconfliction
Provider		Waddington
Altitude/FL		FL022
Transponder	Not Fitted	A, C, S
Reported		
Colours		Grey
Lighting		NK
Conditions		IMC
Visibility		
Altitude/FL	230ft	2500ft
Altimeter		QNH
Heading	090°	SSE
Speed	6kt	200kt
ACAS/TAS	Not fitted	TCAS I
Alert	N/A	Unknown
Separation		
Reported	300ft V/400m H	Not seen
Recorded		NK



THE DJI PHANTOM OPERATOR reports that he was carrying out flights with his DJI Phantom 4 Pro drone on a private site adjacent to the opencast mine at Bantycok, near Newark. He had carried out a site survey, had permission from the landowner, had identified the area as uncontrolled airspace with no local ATC to inform, and was wearing full high-vis clothing and a yellow hard-hat. The drone was moving slowly east, whilst filming, when he observed two military fighter aircraft approaching rapidly at low-level on a southerly heading parallel to the A1 in the general direction of his drone. He immediately applied maximum descent control input, bringing the drone to a lower level as soon as possible. The two military aircraft immediately turned SE and departed.

He assessed the risk of collision as ‘Low’.

UKAB Note: The NATS radars were reviewed and CADS¹ was interrogated to find the aircraft as described by the drone operator. However, the only military aircraft in the area at the time were two Tornados who were at 2000ft in the Waddington radar circuit.

THE TORNADO PILOT reports that they were making an approach to Waddington and were in the radar training circuit. Waddington were operating on RW02. They were vectored in from the NE, for a left-hand pattern, from medium level (10,000 -15,000ft), under a Deconfliction Service. The speed in the instrument pattern was 300kts, becoming 200kts once configured to land. They conducted a single GCA as a pair in close formation, and were fully VMC only for the last 4nm of the approach, prior to that they were intermittent IMC. They did not see the drone.

He assessed the risk of collision as ‘None’.

¹ CADS – Centralised Aviation Data Service, a military low-flying deconfliction planning and notification tool.

THE WADDINGTON APPROACH CONTROLLER reports that the Tornados were in the radar training circuit at the time of the reported incident. They appear to have been unaware of the drone at the time and nothing was reported on frequency, consequently he has no recollection of an incident occurring. No drone activity was reported to Waddington ATC.

Factual Background

The weather at Waddington was recorded as follows:

METAR EGXW 021250Z 33007KT 9999 FEW013 BKN050 10/08 Q1015 BLU TEMPO SCT020 WHT=

A screen shot at Figure 1 taken from the NATS area radar shows the Tornados, squawking 3623, in the Waddington radar pattern at 1310, indicating FL022.

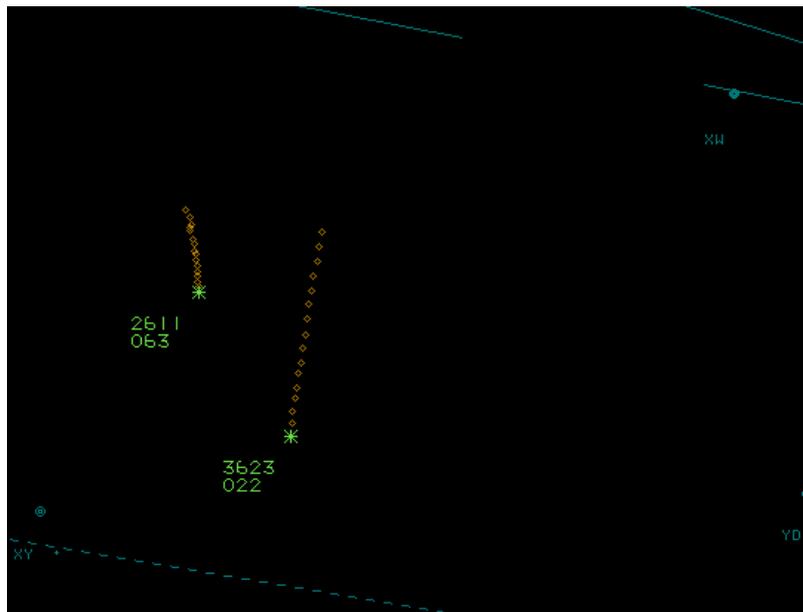


Figure 1: 1310:26

Analysis and Investigation

UKAB Secretariat

The drone operator was entitled to operate in that position at that height, as were the Tornados who were intermittent IMC at 2000ft and unlikely to be able to see the drone.

A CAA web site² provides information and guidance associated with the operation of Unmanned Aircraft Systems (UASs) and Unmanned Aerial Vehicles (UAVs). As part of this information, CAP722 (UAS Operations in UK Airspace) and CAP658 (Model Aircraft: A Guide to Safe Flying) provide comprehensive guidance. Additionally, the CAA has published Drone Aware³ which states the responsibilities for flying unmanned aircraft. This includes the following comment:

‘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). ..., stay well clear of airports and airfields’.

The drone operator reported operating his drone below 400ft, which complies with the requirements above.

² www.caa.co.uk/uas

³ CAP 1202

Comments

HQ Air Command

After thorough investigation into which military fast jet aircraft were in the area reported by the drone operator, the only candidate aircraft were a pair of Tornados conducting an instrument approach to RAF Waddington. Review of the mission materials revealed that these aircraft were in the RAF Waddington instrument pattern and were not flying below 2000-2500ft agl. SUAS of the size involved do not carry any form of electronic conspicuity and would therefore not have been visible on the Tornados' TCAS or the controller's radar screen. Thus the only viable barrier to MAC in this encounter was the lookout and alertness of the Tornado crews and the drone operator. Given that the Tornado crews were in IMC for the majority of the approach it was highly unlikely that they would have seen the drone. However, the drone operator observed the two Tornados and is to be commended for his prompt action to descend his air system when he considered that there might be a conflict in flight paths.

Summary

An Airprox was reported when a DJI Phantom and a Tornado flew into proximity at 1310hrs on Thursday 2nd November 2017. The DJI Phantom operator was filming at 230ft over an open-cast mine in the Newark area. The Tornado pilots were operating under IFR in IMC, conducting a GCA at Waddington and in receipt of a Deconfliction Service.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from the DJI Phantom operator and the Tornado 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 Board first looked at the actions of the DJI Phantom operator. He was entitled to operate where he was, and the Board commended him for taking all the necessary precautions. The Board noted that he had not expected to see the Tornados in this position, but military members commented that in fact the area is usually busy with aircraft routing through the low-level system at 250ft or above and it was probably only because of the weather that there weren't more aircraft around on that day. Members noted that the position of the drone operator was 10nm away from Waddington and, whilst this may appear to be some distance away, radar training circuit for airfields will usually extend out to 10nms at 1500-2500ft depending on local topography and airspace requirements. Ultimately, the Tornados were at 2000ft and, as such, were no conflict with the drone. Members commented that the drone operator had perceived them to be closer than that, and this probably highlighted how difficult it was to judge separation from other aircraft from the ground; the Tornados were probably larger than the drone operator thought, and therefore appeared to be closer to him. Notwithstanding, the Board praised the drone operator for his look-out and actions both on the day and in subsequently reporting the incident. Finally, members highlighted the *Drone Assist* App produced by NATS⁴, which provides drone users with information of any airspace restrictions in the area (which was not an issue in this case) and also has a 'fly now' function that enables drone users to share their location to other App users thus helping to reduce the risk of a drone-related incident. The Board commended the use of the App to all drone operators, and to airfield and aircraft operators, as a useful source of situational awareness about drone operations.

For their part, the Tornado pilots were unaware of the drone and, at 2000ft, were unlikely to see it even if they hadn't been intermittently IMC. Waddington ATC did not know about it either and so could not pass on any Traffic Information, and the TCAS in the aircraft could not see the drone because it wasn't transponder equipped. That said, in this case there was adequate height separation, and the Tornados were not in close proximity to the drone.

⁴ <http://dronesafe.uk/safety-apps/>

In assessing the cause of the Airprox, the Board quickly agreed that the incident was best described as a sighting report. In determining the risk, they judged that this was a benign situation where there had not been any risk of collision and that, with both operators adhering to the regulations, normal safety standards had pertained. Notwithstanding, they unanimously agreed that the drone operator had been right to report the incident and his concerns; it had simply been that by further analysis the Board had been able to assess the encounter as ultimately benign.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A sighting report.

Degree of Risk: E.

Safety Barrier Assessment⁵

In assessing the effectiveness of the safety barriers associated with this incident, the Board concluded that the key factors had been that:

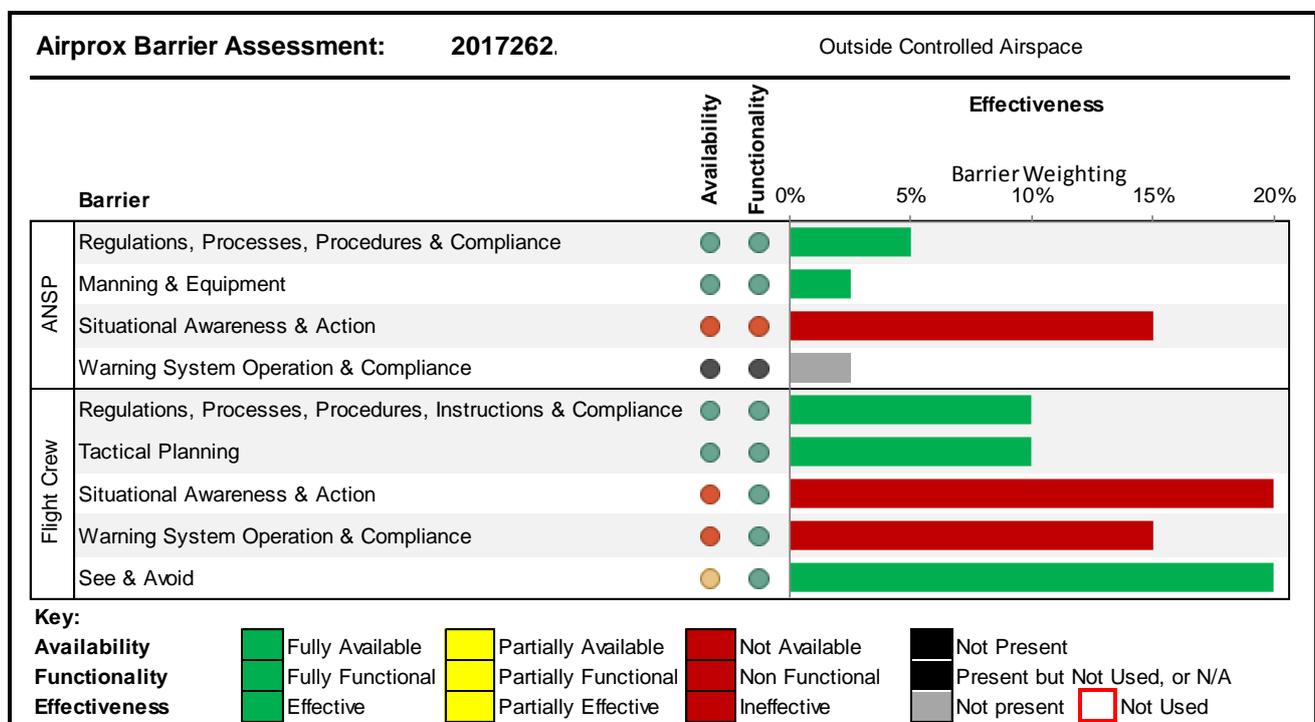
ANSP:

Situational Awareness and Action were assessed as **ineffective** because ATC could not see the drone on the radar and had no other knowledge of it.

Flight Crew:

Situational Awareness and Action were assessed as **ineffective** because neither the Tornado pilots or the drone operator had any situational awareness about each other.

Warning System Operation and Compliance were assessed as **ineffective** because the Tornado's TCAS could not detect the drone because it was not fitted with a transponder.



⁵ The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the [UKAB Website](#).