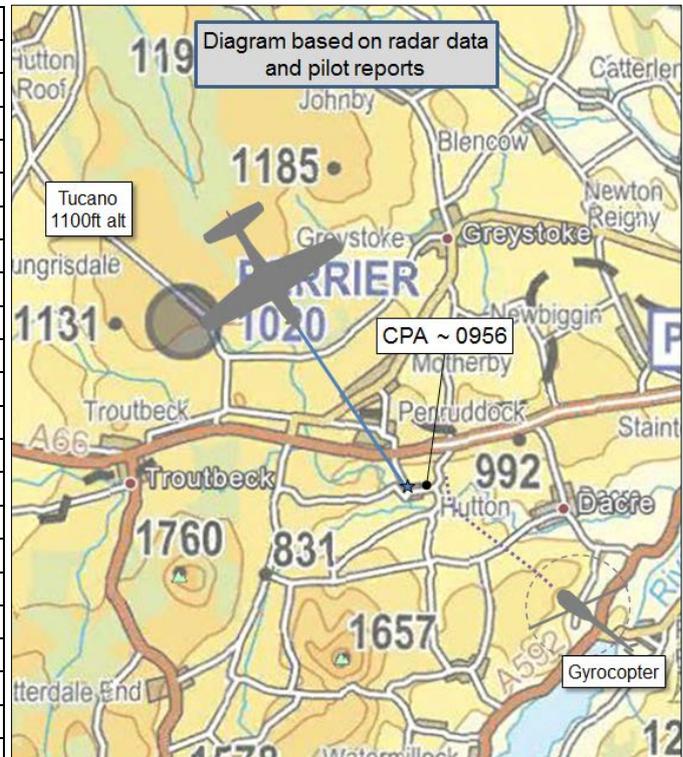


AIRPROX REPORT No 2016170

Date: 10 Aug 2016 Time: 0956Z Position: 5437N 00252W Location: SW Penrith

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Tucano	Gyrocopter
Operator	HQ Air (Trg)	Civ Pte
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	None	None
Provider	N/A	N/A
Altitude/FL	1100ft	NK
Transponder	C, S	Not Fitted
Reported		
Colours	Black, Yellow	Red
Lighting	N/K	Nose Light
Conditions	VMC	VMC
Visibility	>10km	NK
Altitude/FL	250ft	1700ft
Altimeter	RPS (1020hPa)	NK
Heading	146°	NW
Speed	240kt	80kt
ACAS/TAS	TAS	Not fitted
Alert	None	N/A
Separation		
Reported	0ft V/15m or 200-300m H	0ft V/500m H
Recorded	NK	



THE TUCANO PILOT reports that she was the Captain in the rear cockpit on a student sortie 4nm west-southwest of Penrith. Whilst conducting a normal lookout scan, she saw what appeared to be a small object in the 11 o'clock co-altitude, which she called to the student who acknowledged that he was visual also. The object passed down the left side of the aircraft (before avoiding action could be taken), with its trajectory and speed being difficult to ascertain. The student perceived the object differently to her. She believed the object to be a small drone, red and white in colour with rotors and close enough to identify those features. The student identified it as a red object, potentially a gyrocopter (although he was unsure if it was manned) and was unsure of its distance and relative size. At no time (before or after) did the object appear on TCAS. Immediately following the incident, she put out a call on UHF Low-Level Common to alert other users and, once 5 miles clear of the object, instructed the student to climb so she could contact Swanwick Mil to report the incident. Thereafter, the sortie was continued with nothing further to report. She believes that the object was small (a drone) and very close to the aircraft (15m), the student believes it was a larger object (gyrocopter) further away (200-300m).

She assessed the risk of collision as 'Medium'.

THE GYROCOPTER PILOT reports that he was returning from Ullswater to his base when he saw a Tucano on a reciprocal heading; he initiated a turn to the right to avoid but there was never any risk of collision. He commented that in the past (some years ago) he did contact Linton with the suggestion that he call them when he was operating in the local area; however, after several subsequent calls to them, he didn't feel his calls were being passed to the correct authority and so he eventually gave up. He further commented that has absolutely no objection to Military low-flying in the Lake District, in fact, quite the contrary; however, he feels that better liaison would 'make our skies rather safer', particular at relatively low-levels. Quite often military aircraft fly very close to his strip, and sometimes

right over the top at low level, "Great to see, but it would be nice if there was some warning". Traffic from his strip uses the SafetyCom frequency.

He assessed the risk of collision as 'None'.

Factual Background

The weather at Blackpool was recorded as follows:

METAR EGNH 100950Z 30009KT 9999 FEW020 15/10 Q1025=

Analysis and Investigation

UKAB Secretariat

The Tucano and Gyrocopter pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard¹. If the incident geometry is considered as head-on or nearly so then both pilots were required to turn to the right².

Comments

HQ Air Command

The recognised barriers to MAC that are available in Class G airspace are an appropriate air traffic service (ATS), electronic conspicuity and lookout. On this occasion, an appropriate (radar-assisted) ATS was unavailable due to the location and altitude of both aircraft, and electronic conspicuity was unavailable as the gyrocopter was not fitted with equipment capable of interacting with the TAS fitted to the Tucano. Therefore, the crews were relying on lookout to detect and avoid any conflict. In this case, the gyrocopter pilot spotted the Tucano and took appropriate action; the Tucano crew did see the gyrocopter, but too late to take effective action to increase separation. This incident does highlight the difficulties in identifying exactly what the conflicting traffic is, particularly when seen late and with a high passing rate – the instructor thought it was a drone at very close range, whereas the student identified it as a larger object (gyrocopter) at greater range. The Tucano instructor showed initiative in announcing the presence of this object on the low level (UHF) common frequency; it may be that this incident could have been avoided if both aircraft had been on a common VHF frequency – there is an aspiration to extend the use of a low level VHF common frequency across the UK, following the successful trial in Scotland, and work is ongoing.

Summary

An Airprox was reported when a Tucano and a Gyrocopter flew into proximity at 0956 on Wednesday 10th August 2016. Both pilots were operating under VFR in VMC, neither pilot in receipt of a Service.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from the pilots of both aircraft, transcripts of the relevant RT frequencies and radar photographs/video recordings.

The Board began their deliberations by acknowledging the differing perceptions of the object by the Tucano crew, whilst the instructor perceived it as a drone close by, the student believed it was a gyrocopter further away. The Board agreed that this was a pertinent learning point for everyone in that fleetingly seeing an object at the last moment can alter your perception of its size and distance. The Board were grateful that the Tucano instructor had recognised the importance of including both

¹ SERA.3205 Proximity.

² SERA.3210 Right-of-way (c)(1) Approaching head-on.

pilots' perceptions of the other aircraft type and separation in the Airprox report because this had enabled the Gyrocopter to be traced as opposed to the incident being debated as a drone sighting report. The Board also acknowledged the diligence of the Radar Analysis Cell (RAC) in tracking down the Gyrocopter pilot to ensure the Board had all the relevant facts to assess this Airprox comprehensively.

The Board then turned to the actions of the Gyrocopter pilot. They were complimentary of his previous diligence in endeavouring to liaise with Military units and alert them as to his activities, but somewhat saddened that this had not borne fruit in the past. Some members speculated that this was probably because the military low-level users were located all around the country and that the information was probably not getting through. Similar to another previous Airprox (2016150), they opined that this was another opportunity to highlight the Military Low-Level System to other airspace users and military members commented that a better approach would have been to contact the MOD Low Level Advisory Service³ who would then be able to tell him of any planned activity through his area so that the Gyrocopter pilot could then arrange his flight to avoid these times or routes (or at least have greater awareness of them). Ultimately, the Board agreed the Gyrocopter pilot had been visual with the Tucano throughout and had carried out the necessary right turn to deconflict himself with it.

The Board agreed that this was another incident where a VHF Low-Level Common Frequency would have been useful for improving both pilots' situational awareness through timely and pertinent passage of information from other pilots.

The Board then looked at the barriers that were relevant to this Airprox and decided that the following were key contributory factors:

- **Airspace Design & Procedures** was considered **partially effective** overall because of the lack of a VHF LL Common frequency.
- **Flight Crew Pre-Flight Planning** was considered **fully available** in its present guise but only **partially effective** because the pilots were on different frequencies. Whilst this can often be the case, the Board felt that the availability and use of a VHF common frequency for low-level flights and transits in areas where air traffic services are limited would have increased the information available to both pilots regarding the other's presence.
- **Onboard Warning/Collision Avoidance Equipment** was assessed as being **ineffective** because although the Tucano had TAS fitted, the Gyrocopter was not fitted with a transponder therefore the TAS could not identify the Gyrocopter and rendered the equipment ineffective.

The Board then considered the cause and risk of the incident, they agreed that as the Tucano instructor mistook the Gyrocopter for a drone this resulted in a perception that the Gyrocopter was closer than it actually was. Whereas the Gyrocopter pilot was visual with the Tucano and turned to avoid the Tucano, the incident was therefore assessed as the Tucano instructor was concerned by the proximity of the Gyrocopter. Turning to the risk, members agreed that there was no risk of collision and so the Board they assessed the risk as Category E.

PART C: ASSESSMENT OF CAUSE AND RISK

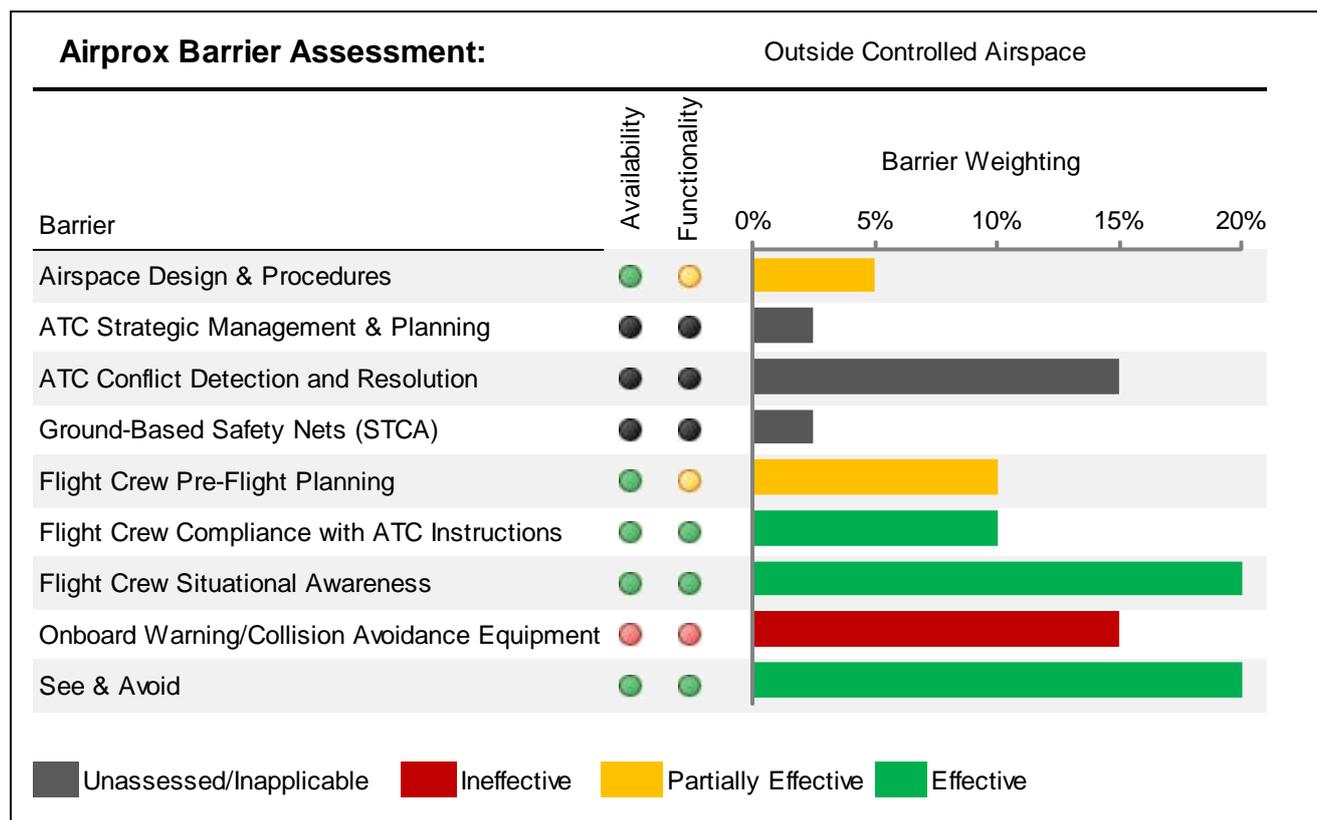
Cause: The Tucano Instructor was concerned by the proximity of the Gyrocopter.

Degree of Risk: E.

Barrier Assessment:

³ <https://www.gov.uk/low-flying-in-your-area/contact-mod>: MOD Low Level Advisory Service operating hours: 0800-1700 Nov – Mar, 0800-2000 Apr – Oct (all times local).

Modern safety management processes employ the concept of safety barriers that prevent contributory factors or human errors from developing into accidents. Based on work by EASA, CAA, MAA and UKAB, the following table depicts the barriers associated with preventing mid-air-collisions. The length of each bar represents the barrier's weighting or importance (out of a total of 100%) for the type of airspace in which the Airprox occurred (i.e. Controlled Airspace or Uncontrolled Airspace).⁴ The colour of each bar represents the Board's assessment of the effectiveness of the associated barrier in this incident (either Fully Effective, Partially Effective, Ineffective, or Unassessed/Inapplicable). The chart thus illustrates which barriers were effective and how important they were in contributing to collision avoidance in this incident.



Barrier Effectiveness		Consequence		
		Non-functional	Partially Functional	Functional
Availability		1	2	3
Completely Unavailable	1	1	2	3
Partially Available	2	2	4	6
Available	3	3	6	9

Key:

	Effective
	Partially Effective (If the system was partially available but fully functional score availability as 2.5)
	Ineffective
	Unassessed/Inapplicable

⁴ Barrier weighting is subjective and is based on the judgement of a subject matter expert panel of aviators and air traffic controllers who conducted a workshop for the UKAB and CAA on barrier weighting in each designation of airspace.

Barrier	Availability			Functionality			Unassessed / Inapplicable
	Fully (3)	Partially (2)	Not Available (1)	Fully (3)	Partially (2)	Non Functional (1)	
Airspace Design and Procedures	Appropriate airspace design and/or procedures were available	Airspace design and/or procedures were lacking in some respects	Airspace design and/or procedures were not appropriate	Airspace design and procedures functioned as intended	Airspace design and/or procedures did not function as intended in some respects	Airspace design and/or procedures did not function as intended	The Board either did not have sufficient information to assess the barrier or the barrier did not apply; e.g. ATC Service not utilised. Note: The Board may comment on the benefits of this barrier if it had been available
ATC Strategic Management and Planning	ATM were able to man and forward plan to fully anticipate the specific scenario	ATM were only able to man or forward plan on a generic basis	ATM were not realistically able to man for or anticipate the scenario	ATM planning and manning functioned as intended	ATM planning and manning resulted in a reduction in overall capacity (e.g. bandboxed sectors during peak times)	ATM planning and manning were not effective	
ATC Conflict Detection and Resolution	ATS had fully serviceable equipment to provide full capability	ATS had a reduction in serviceable equipment that resulted in a minor loss of capability	ATS had a reduction in serviceable equipment that resulted in a major loss of capability	The controller recognised and dealt with the conflict in a timely and effective manner	The controller recognised the conflict but only partially resolved the situation	The controller was not aware of the conflict or his actions did not resolve the situation	
Ground-Based Safety Nets (STCA)	Appropriate electronic warning systems were available	Electronic warning systems is not optimally configured (e.g. too few/many alerts)	No electronic warning systems were available	Electronic warning systems functioned as intended, including outside alerting parameters, and actions were appropriate	Electronic warning systems functioned as intended but actions were not optimal	Electronic warning systems did not function as intended or information was not acted upon	
Flight Crew Pre-Flight Planning	Appropriate pre-flight operational management and planning facilities were deemed available	Limited or rudimentary pre-flight operational management and planning facilities were deemed available	Pre-flight operational management and planning facilities were not deemed available	Pre-flight preparation and planning were deemed comprehensive and appropriate	Pre-flight preparation and/or planning were deemed lacking in some respects	Pre-flight preparation and/or planning were deemed either absent or inadequate	
Flight Crew Compliance with Instructions	Specific instructions and/or procedures pertinent to the scenario were fully available	Instructions and/or procedures pertinent to the scenario were only partially available or were generic only	Instructions and/or procedures pertinent to the scenario were not available	Flight crew complied fully with ATC instructions and procedures in a timely and effective manner	Flight crew complied later than desirable or partially with ATC instructions and/or procedures	Flight crew did not comply with ATC instructions and/or procedures	
Flight Crew Situational Awareness	Specific situational awareness from either external or onboard systems was available	Only generic situational awareness was available to the Flight Crew	No systems were present to provide the Flight Crew with situational awareness relevant to the scenario	Flight Crew had appropriate awareness of specific aircraft and/or airspace in their vicinity	Flight Crew had awareness of general aircraft and/or airspace in their vicinity	Flight Crew were unaware of aircraft and/or airspace in their vicinity	
Onboard Warning/Collision Avoidance Equipment	Both aircraft were equipped with ACAS/TAS systems that were selected and serviceable	One aircraft was equipped with ACAS/TAS that was selected and serviceable and able to detect the other aircraft	Neither aircraft were fitted with ACAS/TAS or their systems were not selected on or unserviceable or systems incompatible	Equipment functioned correctly and at least one Flight Crew acted appropriately in a timely and effective manner	ACAS/TAS alerted late/ambiguously or Flight Crew delayed acting until closer than desirable	ACAS/TAS did not alert as expected, or Flight Crew did not act appropriately or at all	
See and Avoid	Both pilots were able to see the other aircraft (e.g. both clear of cloud)	One pilots visibility was uninhibited, one pilots visibility was impaired (e.g. one in cloud one clear of cloud)	Both aircraft were unable to see the other aircraft (e.g. both in cloud)	At least one pilot takes timely action/inaction	Both pilots or one pilot sees the other late and one or both are only able to take emergency avoiding action	Neither pilot sees each other in time to take action that materially affects the outcome (i.e. the non-sighting scenario)	