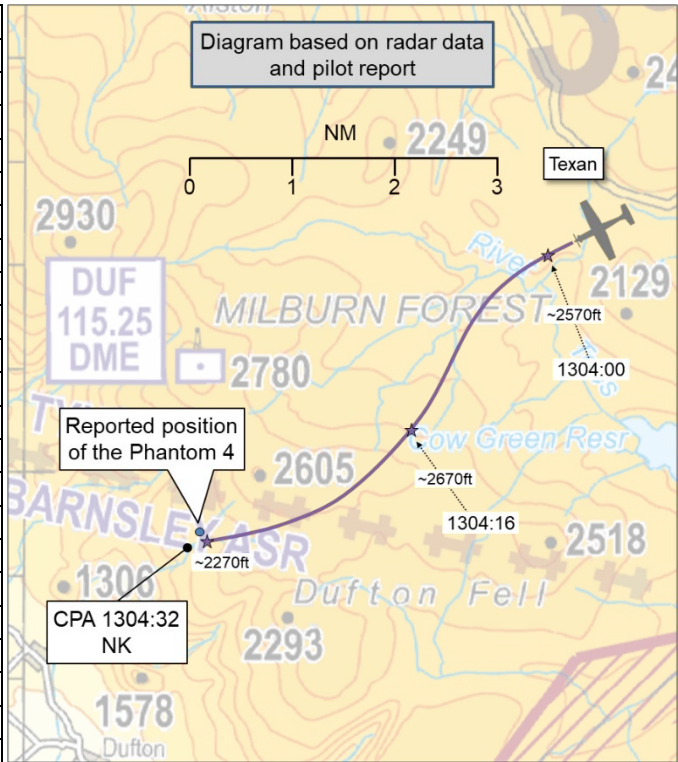


**AIRPROX REPORT No 2024088**

Date: 10 May 2024 Time: 1305Z Position: 5439N 00227W Location: 10NM E Penrith

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

Recorded	Aircraft 1	Aircraft 2
Aircraft	Phantom 4	Texan
Operator	Civ UAS	HQ Air (Trg)
Airspace	London FIR	London FIR
Class	G	G
Rules	VLOS – Open Cat.	VFR
Service	None	None
Altitude/FL	NK	FL020
Transponder	Not fitted	A, C, S+
<b>Reported</b>		
Colours	White	Black
Lighting	LEDs	NR
Conditions	VMC	VMC
Visibility	NR	>10km
Altitude/FL	120m	2300ft
Altimeter	AGL	QNH
Heading	NR	258°
Speed	NR	240kt
ACAS/TAS	Not fitted	TCAS I
Alert	N/A	None
<b>Separation at CPA</b>		
Reported	0ft V/NR H	"not seen"
Recorded	NK	



**THE PHANTOM 4 PILOT** reports that a planned UAS survey was being carried out on Moor House NNR using an automated flight plan. Both an experienced remote pilot and observer were present. The survey was carried out at 120m height AGL using terrain awareness to remain within the UK legal limit for UAS [operations in the Open category]. VLOS was maintained with the UAS during its automated flightpath. Weather conditions were suitable and windspeed for the UAS in use and visibility was very good/excellent, with both the remote pilot and observer happy with being able to see and hear the surrounding airspace.

Near to the end of the automated flight plan, an older style military aircraft suddenly appeared from behind the hill immediately beyond the survey area. The plane appeared too suddenly and too fast for any UAS avoidance manoeuvre (e.g. dropping altitude). The plane passed through the survey area at an estimated altitude equal to or less than the UAS flight altitude of 120m AGL. Fortunately, the UAS was offset from the aircraft meaning no collision occurred. It is unknown what aircraft it was, who the pilot was, or if they had any idea about the UAS in the airspace they passed through.

**THE TEXAN INSTRUCTOR** reports that neither they, nor their trainee, saw a drone on the day. They have reviewed the recordings from the aircraft and cannot visually identify anything in the reported location. They were the QFI, aircraft Captain and Authorizing Officer for the flight and can provide the following details with reference to the reported position ([terrain elevation] 1953ft): The Texan T1 passed to the south of the reported position by approximately 150m at 1304:30Z on 10th May 24. The aircraft was flying at 240kt, heading 258° with the radalt displaying a height between 380 and 500ft, an approximate altitude of 2300ft. The TCAS did not have any aircraft displayed within 20NM, it should be noted that aircraft assessed to be below height 400ft are not always displayed by the TCAS fitted to the Texan T1.

The pilot perceived the severity of the incident as 'Low'.

## Factual Background

The weather at Teesside was recorded as follows:

METAR EGNV 101320Z 17009KT 150V220 9999 FEW045 22/14 Q1023

## Analysis and Investigation

### UKAB Secretariat

An analysis of the NATS radar replay was undertaken and the Texan could be positively identified from Mode S data (Figure 1). The Phantom 4 was not observed on radar.

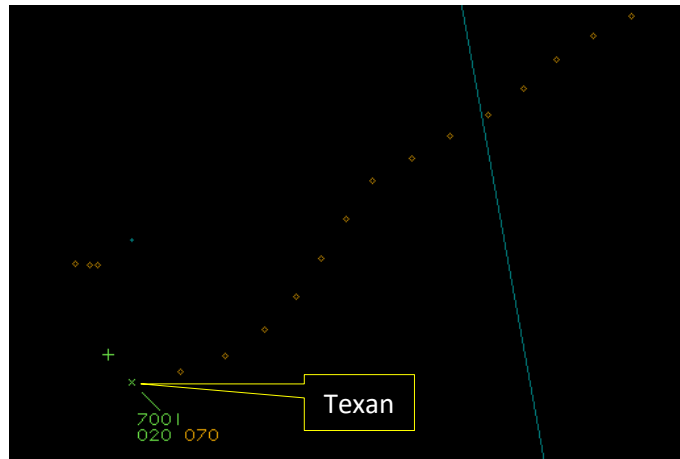


Figure 1

A primary-only return appeared on radar 0.4NM north-west of the Texan at 1304:32 but it could not be identified (Figure 2). The pilot of the Phantom 4 kindly supplied a precise latitude and longitude for their position at the perceived time of CPA (indicated by a white cross in Figure 2). The CPA was estimated to have occurred at 1304:32.

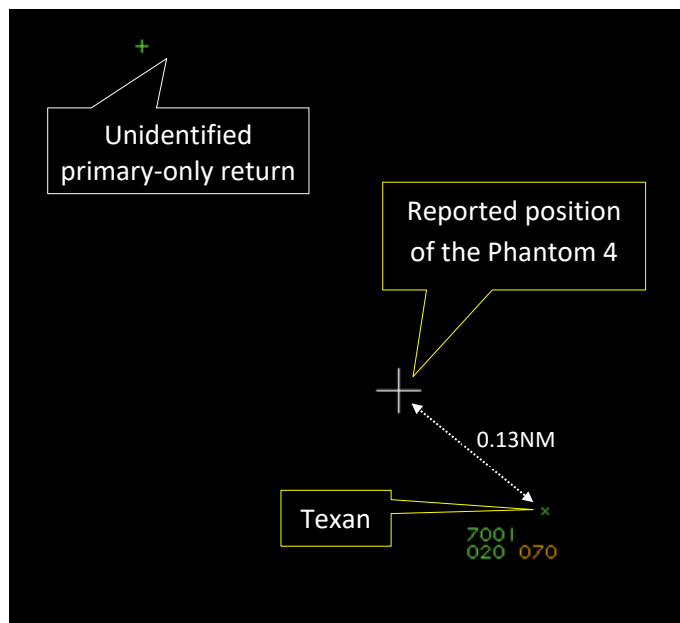


Figure 2 - CPA at 1304:32

The Texan was depicted on the radar replay as having been at Flight Levels and had been at FL020 at CPA. A suitable conversion factor was used to calculate the altitude of the Texan. The elevation of the terrain was approximately 1970ft AMSL and, therefore, the Texan may have been at

approximately 300ft AGL at CPA but this could not be verified. The Phantom 4 was reported to have been at 120m, approximately 400ft AGL.

The horizontal separation at CPA between the Texan and the reported position of the Phantom 4 was 0.13NM. The actual separation between the aircraft at CPA could not be established.

The Phantom 4 and Texan pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.<sup>1</sup> During the flight, the remote pilot shall keep the unmanned aircraft in VLOS and maintain a thorough visual scan of the airspace surrounding the unmanned aircraft in order to avoid any risk of collision with any manned aircraft. The remote pilot shall discontinue the flight if the operation poses a risk to other aircraft, people, animals, environment or property.<sup>2</sup>

## Comments

### HQ Air Command

It is great to see Airprox reported by drone operators. Through examining both perspectives we can understand which drone mid-air collision mitigations are robust and those which aren't. See-and-avoid remains the most effective barrier but, predominantly, from the drone operator's side. Due to the size of drones and the dynamic nature of low-level military flying, pilots are extremely unlikely to spot a drone, either at all or with time to carry out effective avoiding action. They are reliant on the drone operators landing their drones on becoming aware of an approaching aircraft.

To help improve military crews' situational awareness, drone operators are encouraged to notify the Military Airspace Management Cell (MAMC) of their planned sub-400ft flight ([SWK-MAMCLFCOORD@mod.gov.uk](mailto:SWK-MAMCLFCOORD@mod.gov.uk) or 0800 515544). The team will upload their flight details to the military deconfliction tool which all military pilots have to check prior to flight. If a conflict is identified, the pilots are notified and can adapt their planning: a lateral or vertical offset in that area or even direct contact with the drone operator to discuss options. Please note that this notification to the military does not make the area an 'avoid' for the pilots; aircraft may still be seen in the vicinity. It is also beneficial to notify a particular airbase if planning to fly in the vicinity of its Flight Restriction Zone. Details can be found on the RAF website under the particular station. Military low flying takes place in the 0-400ft above ground level volume of airspace within which drone operators are also permitted to operate. With increasing drone activity, it is important to understand each other's demands in this airspace and to work to find solutions ensuring we can share the air safely.

## Summary

An Airprox was reported when a Phantom 4 RPAS and a Texan flew into proximity 10NM east of Penrith at 1305Z on Friday 10<sup>th</sup> May 2024. The Phantom 4 pilot was operating under VLOS (open category) in VMC, the Texan pilot was operating under VFR in VMC. Neither pilot was in receipt of an ATS.

## **PART B: SUMMARY OF THE BOARD'S DISCUSSIONS**

Information available consisted of reports from both pilots, radar photographs/video recordings and a report from the appropriate operating authority. Relevant contributory factors mentioned during the Board's discussions are highlighted within the text in bold, with the numbers referring to the Contributory Factors table displayed in Part C.

The Board first considered the actions of the pilot of the Phantom 4. Notwithstanding that an observer had been present to have assisted, members noted that the Texan had appeared and had passed through the area before the pilot of the Phantom 4 had had time to have reacted. Surmising that the terrain had masked, or had distorted, the sound of the Texan as it had approached, members agreed that the pilot of the Phantom 4 (and, presumably, their observer) had not had situational awareness of

<sup>1</sup> (UK) SERA.3205 Proximity. MAA RA 2307 paragraphs 1 and 2.

<sup>2</sup> Assimilated Regulation (EU) 2019/947- UAS.OPEN.060 Responsibilities of the remote pilot (2)(b).

the Texan until it had been visually acquired at the moment of CPA (CF1). Members agreed that that, effectively, constituted a non-sighting (CF3). An advisor to the Board commented that some RPAS models feature ADS-B-in technology which may assist an RPAS pilot gather some situational awareness of a piloted aircraft in the area (if the piloted aircraft was transmitting an ADS-B-out signal).

Turning to the actions of the pilot of the Texan, members noted that they had been conducting a sortie at low-level. A member with particular knowledge of military low-level operations explained that the sortie in question had been authorised down to 250ft AGL within that military Low Flying Area (LFA). Members noted that details of the Phantom 4’s flight had not been known to the pilot of the Texan. Additionally, members agreed that the TCAS fitted to the Texan would not have been expected to have detected the Phantom 4 (CF2). Consequently, members were in agreement that the pilot of the Texan had not had situational awareness of the Phantom 4 (CF1) and further agreed that they had not visually acquired it at any point during their flight (CF3).

Summarising their discussion, members were in agreement that neither pilot had had awareness of the presence of the other aircraft in the vicinity. Also, although the pilot of the Phantom 4 had visually acquired the Texan apparently below the height of the Phantom 4, it had been too late to have taken any avoiding action. One member suggested that had there been time for the pilot of the Phantom 4 to have taken action, an instinctive reaction may have been to have lowered the Phantom 4 which, ironically, may have decreased the separation. In conclusion, members agreed that safety margins had been reduced but, ultimately, the horizontal and vertical separation between the aircraft had been such that no risk of collision had existed. The Board assigned Risk Category C to this event.

**PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK**

Contributory Factors:

	2024088			
CF	Factor	Description	ECCAIRS Amplification	UKAB Amplification
<b>Flight Elements</b>				
<b>• Situational Awareness of the Conflicting Aircraft and Action</b>				
1	Contextual	• Situational Awareness and Sensory Events	Events involving a flight crew's awareness and perception of situations	Pilot had no, late, inaccurate or only generic, Situational Awareness
<b>• Electronic Warning System Operation and Compliance</b>				
2	Technical	• ACAS/TCAS System Failure	An event involving the system which provides information to determine aircraft position and is primarily independent of ground installations	Incompatible CWS equipment
<b>• See and Avoid</b>				
3	Human Factors	• Monitoring of Other Aircraft	Events involving flight crew not fully monitoring another aircraft	Non-sighting or effectively a non-sighting by one or both pilots

Degree of Risk: C.

Safety Barrier Assessment<sup>3</sup>

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

**Flight Elements:**

**Situational Awareness of the Conflicting Aircraft and Action** were assessed as **ineffective** because neither pilot had situational awareness of the presence of the other aircraft.

<sup>3</sup> The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the [UKAB Website](#).

**Electronic Warning System Operation and Compliance** were assessed as **ineffective** because the EC equipment fitted to the Texan would not have been expected to have detected the presence of the Phantom 4.

**See and Avoid** were assessed as **ineffective** because neither pilot had visually acquired the other aircraft before CPA.

<b>Airprox Barrier Assessment: 2024088</b>		Outside Controlled Airspace						
<b>Barrier</b>		<b>Provision</b>	<b>Application</b>	<b>Effectiveness</b>				
				<b>Barrier Weighting</b>				
				0%	5%	10%	15%	20%
Ground Element	Regulations, Processes, Procedures and Compliance	○	○					
	Manning & Equipment	○	○					
	Situational Awareness of the Confliction & Action	○	○					
	Electronic Warning System Operation and Compliance	○	○					
Flight Element	Regulations, Processes, Procedures and Compliance	✓	✓					
	Tactical Planning and Execution	✓	✓					
	Situational Awareness of the Conflicting Aircraft & Action	✗	✓					
	Electronic Warning System Operation and Compliance	✗	✓					
	See & Avoid	✗	✗					
<b>Key:</b>		<b>Full</b>	<b>Partial</b>	<b>None</b>	<b>Not Present/Not Assessable</b>	<b>Not Used</b>		
Provision	✓	○	✗	○	○			
Application	✓	○	✗	○	○			
Effectiveness	■	■	■	■	□			