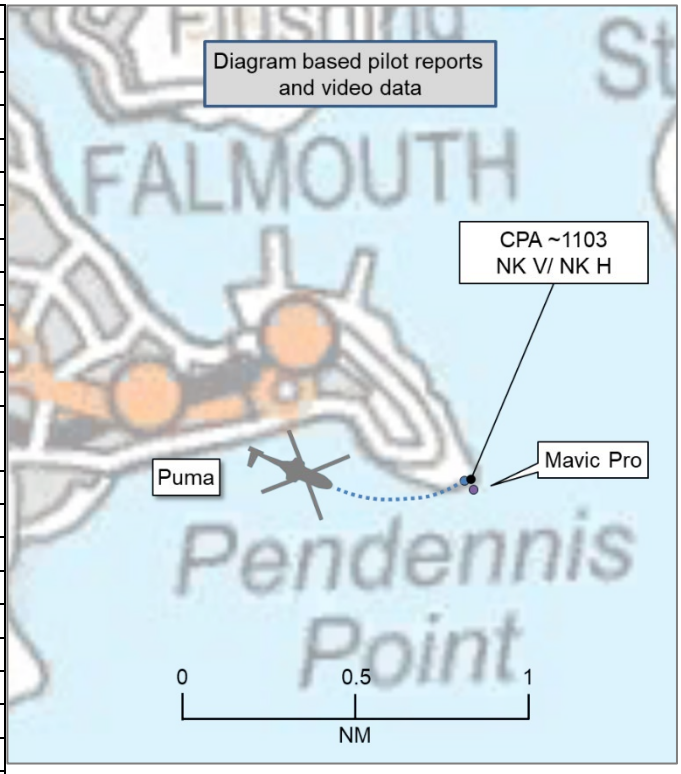
AIRPROX REPORT No 2022038

Date: 26 Jan 2022 Time: ~1103Z Position: 5009N 00503W Location: Pendennis Point

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Puma	Mavic Pro
Operator	HQ JHC	Civ UAS
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VLOS
Service	Basic	None
Provider	Culdrose App	N/A
Altitude/FL	NK	NK
Transponder	A, C, S	Not fitted
Reported		
Colours	Green	Dayglow yellow
Lighting	HISL, Nav, Landing	Strobes, Nav
Conditions	VMC	VMC
Visibility	5-10km	>10km
Altitude/FL	100ft	13ft
Altimeter	NK (NK hPa)	TOLP[1]
Heading	070°	N/A
Speed	120kt	0kt
ACAS/TAS	TAS	Not fitted
Alert	None	N/A
Separation at CPA		
Reported	Not seen	200ft V/200ft H
Recorded	NK V/ NK H	



THE PUMA PILOT reports that they were on a training sortie from [departure airfield] to [destination airfield] and had unknowingly had a near miss with a UAV. Upon returning to [destination airfield] a civilian drone operator contacted them via email to state that they had been flying their drone at Pendennis Point when the Puma flew past at low-level. The distance between the UAV and the aircraft was approximately 200ft. None of the crew had spotted the UAV at the time. From the point of view of the Puma [crew] the UAV would have been very difficult to see as it was small, static and grey on the blue grey background of the sea. Additionally the Puma was in a banked left turn away from the UAV. This event highlights the increasing probability of military aircraft encountering UAVs whilst conducting training sorties.

The pilot assessed the risk of collision as 'Medium'.

THE MAVIC PRO PILOT reports [that the Met conditions] were providing an ideal background for aerial photography of Pendennis Point. At **1021** they contacted RNAS Culdrose Air Ops to check for conflicting traffic and warn in to LFA3 (Pendennis Point is outside Culdrose MATZ but is often active with traffic). They presented their exact grid ref details, a WWII gun mount battery on the water's edge. The information provided included their Op ID, the weight of the UAV and description along with the flight programme from **1045** – **1145**. They further verbally stated an action plan to descend to minimum height and transit at 90° from any sighted traffic. They were then asked to call back in 5min. At **1033**, they made a further call to Culdrose Ops, receiving approval and a "booking ref Number". At **1045**, with approval granted they undertook battery level / input commands check on the UAV then landed within the minute. Sometime later (actual time unknown) they noticed a bright light, below the sky horizon line, from the mouth of the Helford River. They are a Veteran and, having transited out of Culdrose MATZ on this route on many occasions, they were immediately aware that this was some form of low level

[1] Take-off/Landing position.

rotary traffic. Whilst continuing their serial they continued to observe as the aircraft turned left from its approach and ran low and appeared to be continuing, coastline hugging. With retaining VLOS of their UAV a primary concern, they watched [the helicopter] until it went out of sight, past their arc of vision, blocked in part by high rising parts of Pendennis coastline. With routine NAVEX's often occurring and two helicopter low-flying zones within the Falmouth harbour area, it is known for aircraft to undertake this flight profile following the beachline then a short half mile land overflight around Gylnvase beach area, into Falmouth harbour area or continue a left hand circuit increasing in height to depart. With their UAV at 327ft, at approximately **1100,** they heard what they first thought was the diesel engine sound of a returning boat. As the sound increased, at **1102** they recognised the sound of blade sweep coming closer from somewhere, at unknown height, out of view to the right-hand side of their TOLP. They immediately instigated their action plan to descend but without any visual knowledge of aircraft bearing / heading / height, they opted to execute an immediate, manual controlled 'return to TOLP'. The area they were at was protected by a 4ft high rail, meaning they would have had to input a height gain to return the UAV to the exact position, therefore they opted to retain VLOS with a same /lower than body height hover, over the sea, some 106ft [horizontally] from the TOLP. A Puma helicopter appeared heading directly toward their exact location. They have the autonomous (loss of signal) 'return to home' function set to 60 metres (196.8ft) and, with immediate awareness that any HF transmission has potential to saturate their frequency, thus possibly making the UAV revert to an autonomous return to home mode and, also with the knowledge that the downwash from the helicopter in near still-wind conditions would probably cause uplift / downdraft they placed an input command to descend the UAV into the sea. However, it was within this fraction of a second that they saw that the Puma had turned left, inland instigating a sharp left-hand bank wing-over manoeuvre over the lower car park/grass bank area at approximately 200ft height distance from the TOLP. They then instigated an immediate manual return to exact take off point and 'heavy drop sticked' the UAV to ensure it was grounded. At **1104** they reported the incident to Culdrose Ops, undertaking further calls at later times in the day. They requested assistance of the ATCO and later in the day they received a call [from an individual who] was most helpful and transparent in communications, informing them that whilst Culdrose Approach was aware of the Puma's presence, [the pilot] was not operating under Culdrose Approach close control.

The pilot assessed the risk of collision as 'Low'.

THE CULDROSE DEPUTY SATCO reports that the aircrew did not alert the controller to any potential sighting of the drone and they believe the aircrew were only made aware of the close call when the drone operator emailed the Culdrose Ops Officer who subsequently passed the information on. Nothing was sighted on radar and nothing was discussed on frequency. The controller had been working the aircraft under a Basic Service and was not aware of any conflictions.

Factual Background

The weather at RNAS Culdrose was recorded as follows:

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METAR EGDR 261050Z 01002KT 7000 MIFG FEW000 BKN025 OVC030 05/05 Q1035 TEMPO SCT012
BKN022 RMK WHT TEMPO GRN
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Analysis and Investigation

Puma operating organisation occurrence investigation summary

The aircraft was on an overnight land-away in southwest of the UK. At the time of the incident it was carrying out a low-level transit flying along the south coast. At 1103 the aircraft came very close to a UAV. The crew was at no point visual with the UAV, nor [were they] passed any information on its existence. They only found out about the incident via an email sent by the drone operator.

From the UAV operator's point of view, they were operating totally within the "drone code" and had diligently informed Culdrose ATC that they would be operating a UAV in that area. There is no more that the drone operator would be expected to do in this instance.

UKAB Secretariat

Due to the low-level nature of this event the aircraft were not detected on the NATS radar system. The Mavic Pro pilot has supplied the UKAB secretariat with GPS data and video information relating to the Airprox however, as the GPS elevation of the drone had been referenced to the TOLP, no altitude information is available. Track and altitude data for the Puma is not available. Figure 1 below is a still taken from the video supplied by the Mavic Pro pilot, taken from on-board the drone, in which the approach of the Puma can be seen to be above the level of the drone and inland of it. Figure 2 has been extracted from the same video and shows the Puma departing the location shortly afterwards. Although the Mavic Pro pilot contacted the local ATC unit in advance with details of their flight, OC Low Flying confirms that the information was not entered in to CADS and therefore would not have been available to the Puma crew through that system.

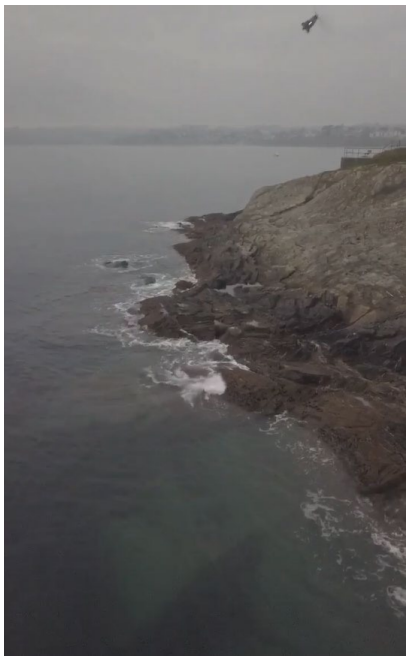


Figure 1 -
Puma flying towards drone

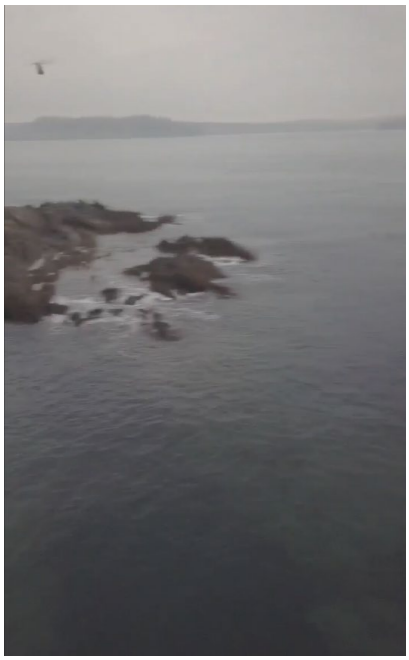


Figure 2 –
Puma flying away from drone

The Puma and Mavic Pro pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.[2] 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.[3]

Comments

JHC

As stated in the DASOR, this incident highlights the increased likelihood of military aircraft encountering UAVs whilst transiting, particularly at Low-Level. Noting that the Mavic Pro Pilot had contacted Culdrose Ops to warn into LFA3 (a Dedicated User Area), it is unclear why this information did not reach the Puma crew, transiting on a Basic Service to [destination airfield]. JHC has passed this DASOR to the MAA and RAF Safety Centre.

[2] (UK) SERA.3205 Proximity. MAA RA 2307 paragraphs 1 and 2.
[3] EASA Part UAS.OPEN.060 Responsibilities of the remote pilot (2)(b).

Summary

An Airprox was reported when a Puma and a Mavic Pro flew into proximity at Pendennis Head at approximately 1103Z on Wednesday 26th January 2022. The Puma pilot was operating under VFR in VMC in receipt of a Basic Service from Culdrose Approach, the Mavic Pro pilot was operating under VLOS and not in receipt of an ATS.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, reports from the air traffic controllers involved and reports from the appropriate operating authorities. 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 Puma pilot and agreed that information regarding the operation of the Mavic Pro had not been made available to them to enable them to have planned appropriately for its presence (**CF3**). members noted that the TAS that had been carried on the Puma had been unable to detect the Mavic Pro (**CF6**) and members quickly agreed that the Puma pilot had had no prior awareness of its presence (**CF4**) and had not become visual with it at any point (**CF7**).

The Board next considered the actions of the Mavic Pro pilot and had been encouraged by their awareness of the local airspace structure and the actions that they had taken to notify RNAS Culdrose of their activity. A Military member commented that when possible, drone pilots are asked to give at least 4 hours' notice of their operation but ideally notify the relevant air-traffic agency and, if applicable, the Military low flying cell[4] the day before. Members agreed that, as the Mavic Pro pilot had heard the Puma before sighting it, they had had generic awareness of its presence (**CF4**) and that that had caused them concern prior to sighting it (**CF5**), to the extent that they had been prepared to lower the drone into the sea.

Members' attention then turned to the ground element involvement at RNAS Culdrose and a Navy military member stated that agencies do have procedures in place to disseminate information submitted by RPAS pilots and other pilots who may be operating in the area to both ATC and flight crews. On this occasion however, the information submitted by the Mavic Pro pilot had not been passed onwards (**CF1**) and the Board agreed that, as a result, the Culdrose controller had had no awareness that the Mavic Pro (**CF2**) had been in the vicinity.

Finally, the Board considered the risk involved in this Airprox. Members noted that the Puma pilot had not been aware of the Mavic Pro and had not become visual with it, however the Mavic Pro pilot had had generic awareness of the presence of the Puma prior to sighting it and, once visual, had manoeuvred to increase the separation. Members agreed that, although safety had been degraded, there had been no risk of collision. Consequently, the Board assigned a Risk Category C to this event.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2022038			
CF	**Factor**	**Description**	**ECCAIRS Amplification**	**UKAB Amplification**
	Ground Elements			
	• Regulations, Processes, Procedures and Compliance			
1	Organisational	• Aeronautical Information Services	An event involving the provision of Aeronautical Information	The Ground entity's regulations or procedures were inadequate
	• Situational Awareness and Action			

[4] Phone 0800 515544 (between 7am to 11pm on Mon-Thursday and 7am – 5pm on Fridays) before you fly or send an email to Swk-Ifofdrones@mod.gov.uk with the date, time, location and max altitude of your flight.

2	Contextual	• Traffic Management Information Action	An event involving traffic management information actions	The ground element had only generic, late, no or inaccurate Situational Awareness
	Flight Elements			
	• Tactical Planning and Execution			
3	Organisational	• Flight Planning Information Sources	An event involving incorrect flight planning sources during the preparation for a flight.	
	• Situational Awareness of the Conflicting Aircraft and Action			
4	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
5	Human Factors	• Unnecessary Action	Events involving flight crew performing an action that was not required	Pilot was concerned by the proximity of the other aircraft
	• Electronic Warning System Operation and Compliance			
6	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
	• See and Avoid			
7	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[5]

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

Ground Elements:

Regulations, Processes, Procedures and Compliance were assessed as **partially effective** because although information regarding the operation of the drone had been available within the unit, this had not been fully disseminated.

Situational Awareness of the Confliction and Action were assessed as **not used** because the controller had not been made aware of the presence of the drone.

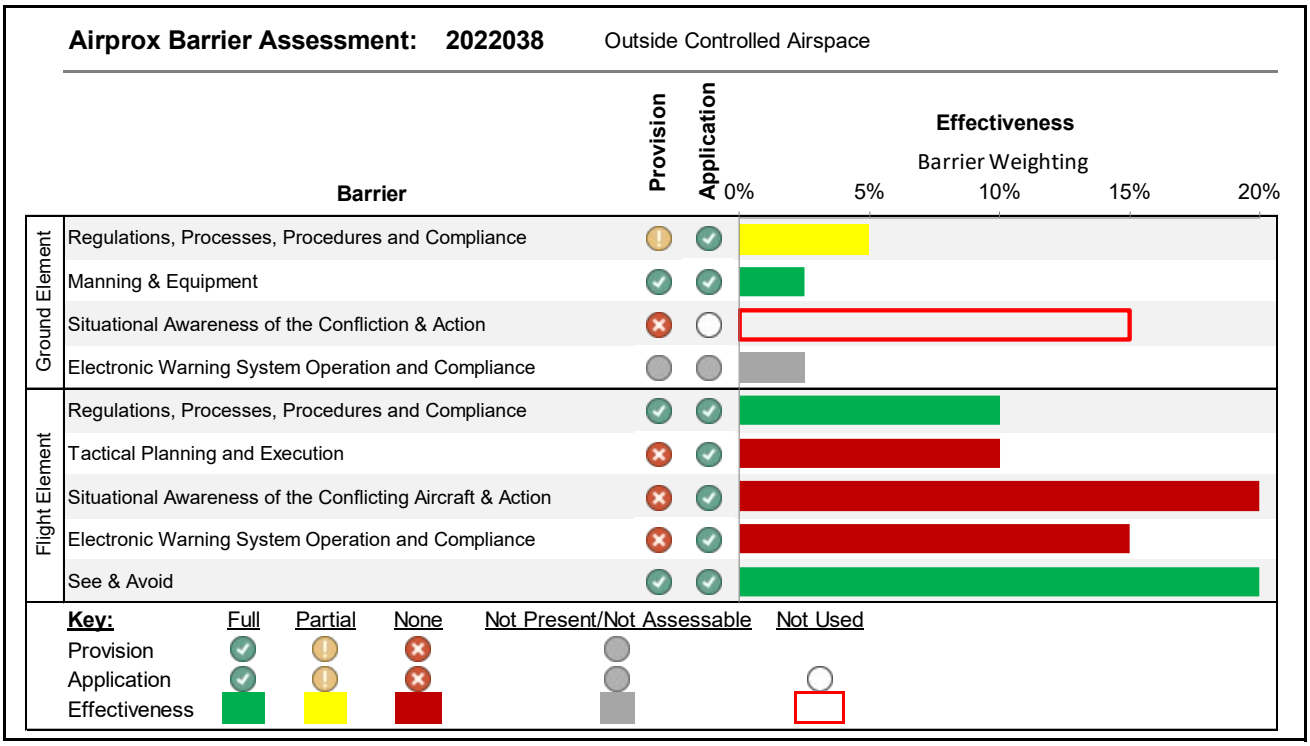
Flight Elements:

Tactical Planning and Execution was assessed as **ineffective** because information relating to the operation of the drone had not been available to the crew to inform their planning.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because the Puma crew had had no prior awareness of the presence of the drone.

Electronic Warning System Operation and Compliance were assessed as **ineffective** because although the Puma had been carrying EC equipment, it had been unable to detect the presence of the drone.

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


Airprox Barrier Assessment: 2022038
Outside Controlled Airspace
Barrier
Provision
Application
Effectiveness
Barrier Weighting
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
Key:
Full
Partial
None
Not Present/Not Assessable
Not Used
Provision
Application
Effectiveness