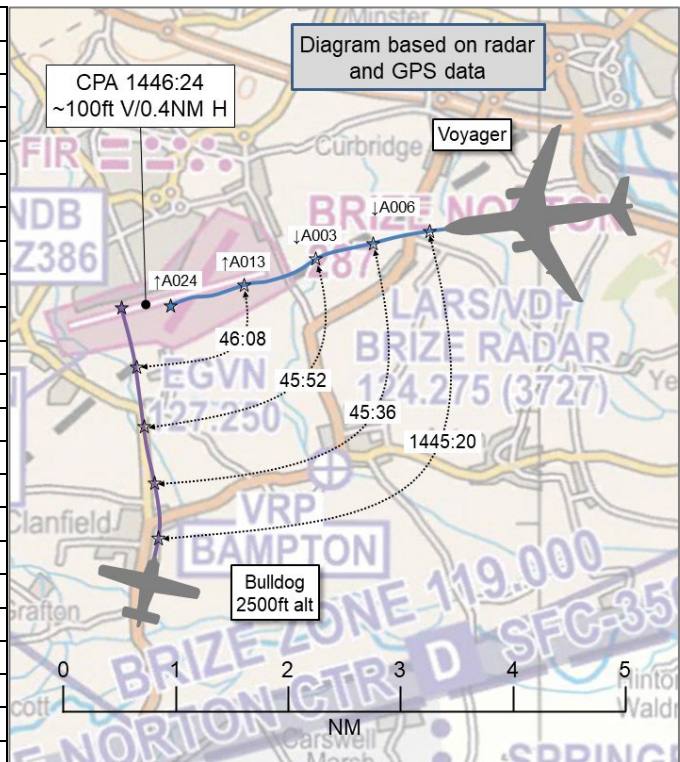


AIRPROX REPORT No 2021228

Date: 09 Nov 2021 Time: 1446Z Position: 5145N 00135W Location: Brize Norton overhead

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Voyager	Bulldog
Operator	HQ Air (Ops)	Civ FW
Airspace	Brize Norton CTR	Brize Norton CTR
Class	D	D
Rules	IFR	VFR
Service	Radar Control	Radar Control
Provider	Brize Director	Brize Zone
Altitude/FL	2400ft	2500ft ¹
Transponder	A, C, S	A
Reported		
Colours	Grey	Red, white
Lighting	Strobes, beac, nav	Strobes
Conditions	NK	VMC
Visibility	>10km	>10km
Altitude/FL	2500ft	2300ft
Altimeter	QNH (1022hPa)	QNH (1022hPa)
Heading	254°	340°
Speed	200kt	105kt
ACAS/TAS	TCAS II	SkyEcho
Alert	TA	None
Separation at CPA		
Reported	0ft V/200m H	200ft V/200yds H
Recorded	~100ft V/0.4NM H ²	



THE VOYAGER PILOT reports that, following a number of visual circuits to touch-and-go, clearance was requested from Brize Tower for a low-approach to go-around into SID B to be followed by a radar-vector ILS approach. Climb-out details for a SID B were received when downwind in the visual circuit and clearance for a low-approach and go-around was received after calling final. The go-around was commenced at 200ft agl (radio altimeter) and the aircraft established in the initial climb before contacting Brize Director. Thrust reduction, acceleration and flap retraction were commenced on schedule at 1800ft QNH, and shortly afterwards a TCAS Traffic Advisory was triggered with a contact directly ahead. The TCAS SOP was performed but no relative altitude was displayed on the intruder so the situation could not develop into a Resolution Advisory. No visual contact on the intruder was achieved. Just as the aircraft began to enter cloud, the safety pilot occupying the supernumerary observer's seat saw a light-aircraft (believed to be a PA28) at co-level in the 2 o'clock flying on a slightly diverging track to the north-west. There was no opportunity to take avoiding action and the aircraft passed down the right side within a distance estimated be 200m. Neither the PF nor PM gained visual contact, although the PM was aware in their peripheral vision of the fleeting presence of an object in the direction called by the safety pilot. The climb was continued and the aircraft was levelled at 2800ft in IMC. ATC was queried about the conflict and was believed by all 4 pilots on the flight deck to have reported that the traffic was co-ordinated at 500ft above. The risk of collision was perceived by the Voyager crew as high due to the relative position and energy state of the aircraft, rendering the light-aircraft unlikely to have been able to take effective action to avoid the Voyager if the trajectories had actually converged.

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

THE BULLDOG PILOT reports that they asked for a crossing service from Brize Radar to cross Brize Zone, from Faringdon to Burford VRP's. This was granted and they remained under Radar Control [they

¹ GPS-derived.

² Vertical separation derived from a comparison of radar and GPS data.

believed] for the whole time that they were in the Brize Zone. They were told that one RAF aircraft was in the circuit. They did not see this aircraft until it passed close by them, lower and behind their flightpath.

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

THE BRIZE DIRECTOR CONTROLLER reports that they had no aircraft on frequency when the RA controller passed them a strip for [the Voyager]. [The Voyager pilot] had requested to depart the visual circuit for the instrument pattern climbing to 2800ft QNH, to perform an ILS approach. On initial call, the pilot reported that they had received a warning from the TCAS, and asked about another aircraft that was crossing the Zone. The controller believed that the other aircraft was above the Voyager's level working RA/Zone band-boxed. When they checked the level with the RA controller, they realised it was not below 2300ft QNH and [the Voyager pilot] had climbed through that level as instructed. The Zone crossing traffic was not displaying Mode C information at the time.

The controller perceived the severity of the incident as 'Medium'.

THE BRIZE RA/ZONE CONTROLLER reports that they were band-boxing RA and Zone at the time of this incident. They took over the position at approximately 1400; they were operating on RW25, weather conditions were WHT with a layer of SCT cloud at 2300ft. Most of the traffic to this point was VFR Zone transits, there was an A330 (the Voyager) in the visual circuit and the Director controller had a PA28 in the RTC³ conducting multiple approaches.

Before this incident had started to unfold, the Radar controller had spotted an aircraft in the vicinity of Abingdon airfield with a Mode C indicating 201. Once this was pointed out to them, they kept track ident on the aircraft. Their recollection is that the aircraft was squawking 3601, it appeared that the Mode C was recycled and shortly afterwards the aircraft squawked 7000. The [pilot of the] aircraft subsequently free-called them on the Zone frequency to request a Zone transit.

[The Bulldog pilot] requested a Basic Service and VFR transit via Faringdon and Burford. The controller approved the crossing from Faringdon to Burford, VFR not below altitude 2300ft. Once this was acknowledged by [the Bulldog pilot], they called the Tower controller to inform them of the Zone transit. A couple of minutes later, they received a call from the Tower controller stating that [the Voyager] was downwind to low-approach and was requesting a SID B for an ILS. The RA controller approved the SID B with [the Voyager pilot] instructed to contact Director on climb-out.

When [the Bulldog] entered the CTR, the controller gave the pilot Traffic Information on [the Voyager]. A short time later, the pilot reported that they were visual with the A330. As [the Bulldog] was approaching the overhead, the controller noticed that [the Voyager] had started to climb earlier than they had anticipated and that the 2 aircraft would pass close together. It was too late to take corrective action at this time. VFR rules within Class D airspace require aircraft pilots to get visual with conflicting traffic and maintain their own separation against it. Because [the Bulldog pilot] had told the controller that they were visual, the controller expected them to maintain separation against [the Voyager]. As [the Voyager] was climbing out, the Director controller informed the RA/Zone controller that the aircraft had just had a TCAS alert.

The controller perceived the severity of the incident as 'Medium'.

THE BRIZE TOWER CONTROLLER reports that they were advised that the pilot of [the Voyager], who was carrying out multiple visual circuits, reported an Airprox as they departed the visual circuit on a SID B. The controller felt relatively busy in Tower during this period; they had a Ground controller in position whilst they were controlling the A330 in the visual circuit and sequencing against a PA28 conducting multiple instrument approaches. Their recollection of the order and timing of events is not clear, however their description as they can recall it is as follows:

They recall being informed by [the RA/Zone controller] of a VFR zone transit that would transit from Faringdon to Burford not below 2300ft. They advised [the RA/Zone controller] that they would keep an

³ Radar Training Circuit.

eye on it, knowing their circuit traffic was in the visual circuit at 1800ft. They do not recall whether they informed [the Voyager pilot] of the Zone transit, and do not recall the location of the Zone transit when they were informed of it by [the RA/Zone controller].

[The Voyager pilot] reported downwind that they wanted to conduct a low-approach and depart the circuit on a SID B. The Tower controller informed the [RA/Zone] controller of this who provided climb-out details for a SID B and to contact Brize Director. The Tower controller provided a clearance to low-approach to [the Voyager pilot] when they called final, and then, because [the Voyager] still had over 2 track miles until touchdown, provided climb-out details. They recall [the Voyager] conducting an early low-approach and remaining relatively high, as the controller deemed it safe to turn the RW25 traffic lights to green earlier than expected. They do not recall the position of [the Voyager] or the Zone transit when they instructed the frequency change to Director.

The controller perceived the severity of the incident as 'Medium'.

THE BRIZE SUPERVISOR reports that ADC was manned with Ground also manned due to [the Voyager] in the visual circuit. RA was band-boxed with Zone and was working the occasional CTR transit. Director was manned with [a PA28] in the RTC.

They were at the Supervisor's console, mid-handover to the oncoming Supervisor, when they overheard a comment regarding the Mode C of an aircraft. They had observed an aircraft working Benson SE of the CTR with a mode C of 201- (unusual, well inside CAS) sometime earlier so took interest. On assessing the radar display, they saw the aircraft working Zone within the CTR SW of the Brize Norton overhead tracking north, indicating 201-. They asked the RA controller for the aircraft's reported level, and was told "not below 2300ft". They asked the RA controller if this aircraft had previously worked Benson. The RA controller said "yes", the Supervisor then asked the RA controller to instruct the aircraft to switch off Mode C, which they both did. The Supervisor was content that the Zone transit not below 2300ft was separated from [the Voyager] in the visual circuit not above 1800ft, so continued their handover.

As the workload was medium-to-low, they would have expected in this instance that Traffic Information would have been passed from the RA controller to [the Bulldog pilot], the RA controller to the ADC, then from the ADC to [the Voyager pilot]. The Supervisor was unaware if this had been completed as they were conducting the handover. They were also unaware that [the Voyager pilot] was departing the visual circuit, and were unaware they had been given SID B (2800ft) as this had been arranged whilst they were conducting their handover. Director was already manned therefore there was no requirement for personnel management - requiring no Supervisor input.

After they had completed the handover, they were informed that [the Voyager pilot] was reporting a TCAS input against the Zone transit. By this time, they were no longer the Supervisor but enquired as to the details and were appraised of the incident details.

Factual Background

The weather at Brize Norton was recorded as follows:

METAR EGVN 091450Z 21008KT 9999 BKN021 14/10 Q1022 NOSIG RMK WHT WHT=

Analysis and Investigation

Military ATM

The Brize Norton Zone controller was band-boxed with the Approach task and was providing a Basic Service to the Bulldog pilot and had up to 4 other aircraft on frequency in the lead-up to the Airprox. The controller approved the Bulldog pilot's request to route through the CTR not below 2300ft Brize QNH and had noted that, prior to coming onto the frequency, the transponder had shown a spurious reading. The controller passed Traffic Information to the Brize Aerodrome controller regarding the routing and altitude of the Bulldog. During the transit, between dealing with their other aircraft on

frequency, the Zone/Approach controller took a call from the Aerodrome controller who was requesting clearance for the Voyager to depart the visual circuit and join the radar training circuit (RTC). A SID B climbing to 2800ft, the standard RTC altitude, along with an instruction to contact the Brize Director was approved by the Zone/Approach controller. Following this, Traffic Information was passed to the Bulldog pilot with an instruction to report when they were visual. The Bulldog pilot was also requested to turn off their Mode C as it was displaying an incorrect altitude. The Bulldog pilot reported visual followed by a request to descend to 2000ft due to the weather, which was approved.

The Brize Aerodrome controller was controlling the Voyager in the visual circuit conducting multiple circuits, as well as sequencing with a light aircraft that was conducting instrument approaches. They had a Ground controller in position and recall being told about the CTR crosser not below 2300ft and, although they informed the Approach controller they would 'keep an eye on it', they reported that they did not recall the position of the transit. After requesting departure details from the Approach controller, and because the Voyager had 2 track miles to run on their approach, the departure clearance was passed. The Aerodrome controller noted that the Voyager pilot commenced their low approach early and instructed the Voyager pilot to change frequency to Director.

The Brize Director was not controlling any other aircraft and had been passed the strip for the Voyager RTC. They reported that on the initial call from the Voyager pilot, the pilot told the controller that they had had a warning on their TCAS and requested information. The Director confirmed the level with the Approach controller and confirmed that the Bulldog was at 2300ft QNH. The Bulldog was not displaying Mode C at the time.

The Brize Norton Supervisor noted that they were aware of the CTR transit and were in the Approach room at the time of the occurrence, but were in the middle of a handover to the oncoming Supervisor. They considered the Approach room to be sufficiently staffed and were not aware of the Voyager pilot's intent to depart the visual circuit into the RTC.

Figures 1-5 show the positions of the Voyager and the Bulldog at relevant times during the Airprox. The screenshots are taken from a replay using the NATS radars which are not utilised by the Brize Zone/Approach controller, therefore may not be entirely representative of the picture available to the controllers.

Figure 1 was the first available screenshot taken at 1445:00. The Bulldog pilot had been given a CTR crossing clearance and the Approach controller had approved a SID B departure for the Voyager to join the RTC which had been relayed to the Voyager pilot by the Aerodrome controller. Traffic Information had been passed to the Bulldog pilot 52sec previously as "*traffic north east 7 miles, er tracking north west is an A330 in the visual circuit at Brize, conducting a low approach, then climbing out er runway track 2800ft, report when you're visual*". The Bulldog's Mode C was displaying incorrectly at this point. Between the Traffic Information being passed to the Bulldog pilot and Figure 1, the Approach controller was handling 2 other aircraft.

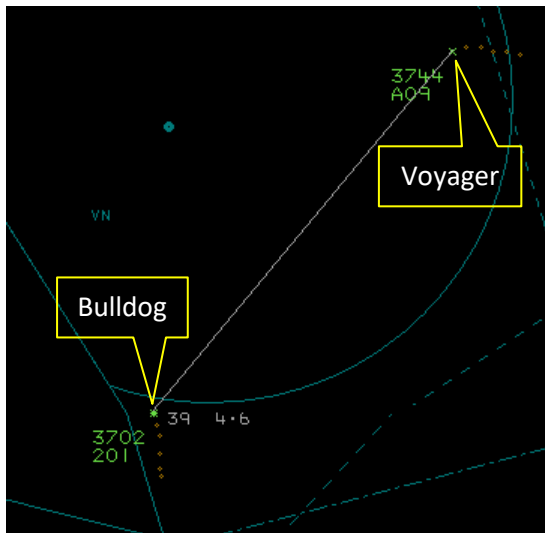


Figure 1
1st available screenshot

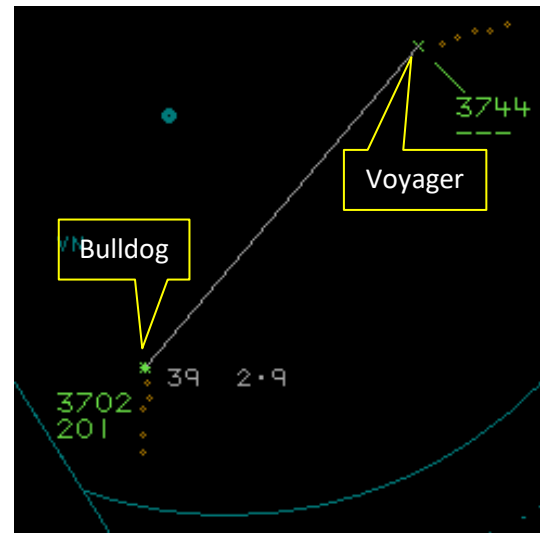


Figure 2
Bulldog pilot asked to turn off Mode C

Thirty-seven seconds later, observing the Bulldog's incorrect Mode C, the Approach controller requested the pilot to turn off the Mode C (Figure 2). This was not acknowledged by the Bulldog pilot. Separation decreased to 2.9NM horizontally with an unknown vertical separation.

Six seconds later the Bulldog pilot reported visual with the Voyager. Separation had decreased to 2.4NM (Figure 3). On completion of their approach in the visual circuit, the Voyager pilot was instructed to switch to Brize Director (Figure 4). Three seconds prior to this, the Mode C on the Bulldog was seen to be turned off. The Approach controller, 11sec earlier, had provided another aircraft with a squawk and QNH and agreed a Basic Service. Separation decreased to 1.6NM horizontally with an unknown vertical separation.

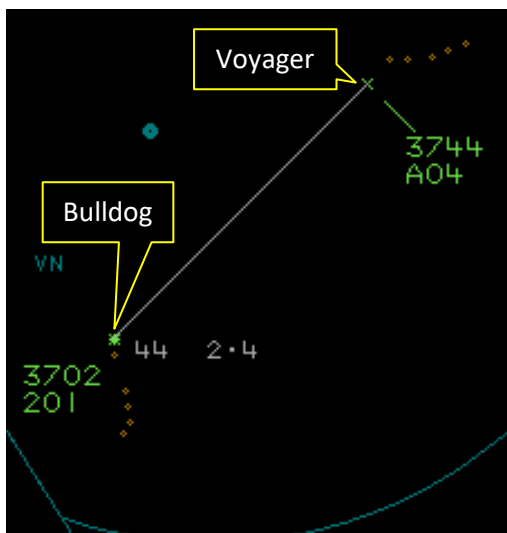


Figure 3
Bulldog pilot reported visual

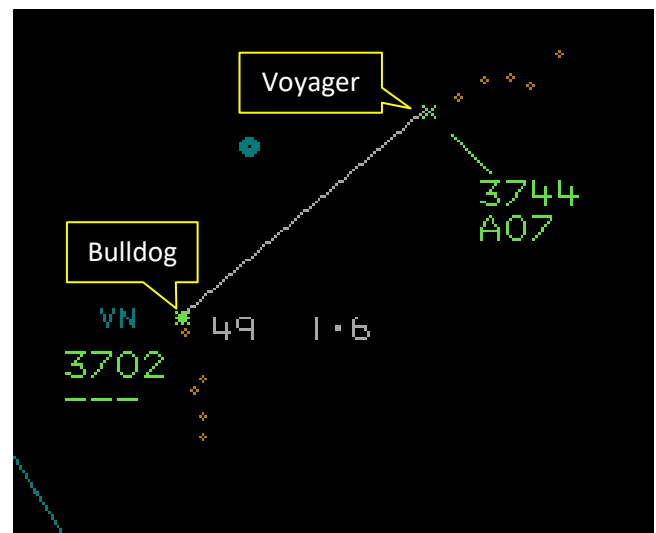


Figure 4
Voyager pilot transferred to Director

Twenty-two seconds later CPA occurred (Figure 5). Separation was measured at 0.4NM horizontally; the vertical separation could not be measured on radar.

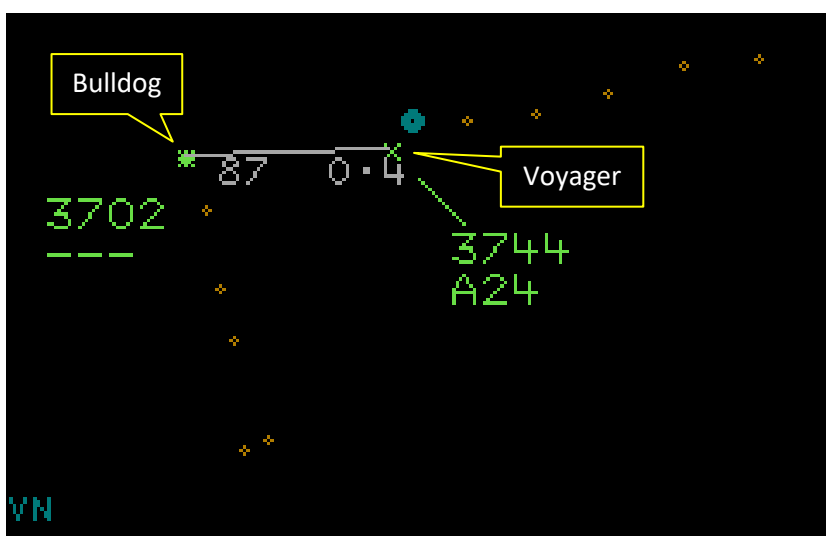


Figure 5
CPA

The Zone/Approach controller was working steadily with moderate traffic levels. Although band-boxing the two positions would have decreased the number of tracks on frequency, it would have increased the internal liaison requirements within the Approach room. The Approach controller did not upgrade the Bulldog pilot's type of service to Radar Control on entering the CTR or advise them they were entering controlled airspace or remind them to remain VMC. The OSI that was conducted by Brize Norton Station also identified that the Approach controller had insufficient knowledge of the Bulldog pilot's requested lateral profile and that they did not consider the proximity of the Bulldog and the Voyager when a climb to 2800ft was approved. The Approach controller lacked an appreciation of the two aircraft's approved profiles and did not manage the situation.

The Aerodrome controller did not broadcast the CTR crossing when the Traffic Information was first passed, believing that the Bulldog was not a factor against the Voyager in the visual circuit. This lack of a broadcast resulted in the Voyager pilot having no awareness of the transit, which may have influenced the timing of their request to depart the visual circuit. It is unknown if the Aerodrome controller used their Aerodrome Traffic Monitor to aid their situational awareness, especially with the knowledge of a CTR transit not below 2300ft and departure instructions to depart to 2800ft.

Additionally, points that were highlighted by the Brize Norton investigation were the poor use of RT and the fact that the Approach controller did not pass Traffic Information relating to the Bulldog to the Director. The investigation conducted by Brize Norton as a whole and by ATC was thorough and provided a comprehensive review of the event and highlighted suitable corrective actions.

UKAB Secretariat

The Voyager and Bulldog pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.⁴ An aircraft operated on or in the vicinity of an aerodrome shall conform with or avoid the pattern of traffic formed by other aircraft in operation.⁵ Pilots of aircraft operating under VFR in Class D airspace are required to maintain their own separation, assisted by information from the controller, from other VFR flights and IFR flights.⁶

⁴ (UK) SERA.3205 Proximity. MAA RA 2307 paragraphs 1 and 2.

⁵ (UK) SERA.3225 Operation on and in the Vicinity of an Aerodrome. MAA RA 2307 paragraph 17.

⁶ (UK) SERA.5005 Visual flight rules para (h)(1) and (UK)SERA.8005 Operation of air traffic control service para (b).

Occurrence Investigation (Summary)

The OSI⁷ was conducted by 2 trained Occurrence Investigators (OI); an Air Traffic Controller and an Air System Operations Manager. The OIs obtained tape transcripts from all relevant control positions, interviewed both pilots and all controllers involved. All times and dates are approximate having been established through interviews and by reference to associated documentation.

All of those engaged with throughout the investigation were competent, HF trained and authorised to conduct their roles. Four Outcomes were identified and 8 Recommendations are made.

Outcome 1: Traffic information was not broadcast in accordance with RA3261.

Recommendation 1: DSATCO is to include the requirement for ADC to pass TI on Zone transits in the 'ADC Responsibilities' Order within the ATC Sqn Battlespace Management (BM) Order Book. This requirement should be aligned to RA3261(3).

Recommendation 2: DSATCO is to review Local Training Objectives to ensure the requirement for ADC to pass TI on Zone transits is included.

Outcome 2: The Voyager [pilot] was given clearance to climb to 2800ft into conflict with the Bulldog.

Recommendation 3: SATCO is to ensure that ATC HF facilitators are aware of this occurrence and are to include the findings in HF Continuation Training.

Recommendation 4: OC OSW and Sqn Cdrs are to make best effort to re-energise the ATC Flying Sqn Liaison Officer network, despite high operational tempo and taut human resource.

Recommendation 5: SATCO should issue a Standards Bulletin to highlight the findings of this [investigation], specifically the importance of using standard phraseology and consideration for the use of alternative routings to avoid Loss Of Safe Separation.

Outcome 3/4: Airprox. Safe separation was lost between the Voyager and Bulldog aircraft.

Recommendation 6: SATCO is to engage with the CAA and RAUWG and utilise this incident to remind GA users on their responsibilities under VFR within Class D airspace.

Recommendation 7: The RAF Brize Norton Flying Order book is to be amended to include Zone Transit ATC procedures (Order 2380).

Recommendation 8: OC 2Gp Staneval in liaison with BZN SATCO is to consider publication of the RAF BZN BMOB (TSOB) on the 2Gp STANEVAL website, alongside extant links, to enhance crew awareness of ATC procedures.

Comments

Brize DDH/AM

With MAC a top DDH risk there was much to extract from this Airprox between a civilian CTZ crosser and a Voyager conducting local training. The OSI delivered a comprehensive report, finding that the Bulldog pilot '[did not] comply with Class D rules regarding 'see & avoid' resulting in [their] aircraft being in an unsafe position, with little time to react to the presence of the Voyager'.

Although there is clearly an urgent need to engage with routine users of the Brize Norton CTZ to confirm and educate where necessary on Class D rules and procedures, the focus of the OSI on

⁷ Occurrence Safety Investigation.

ATC highlighted several areas for improvement and generated discussion within the ORG⁸ on what level of information should be shared with operators. The majority of military aircrew will be familiar with the concept of a MATZ Crosser from flying training, if not elsewhere, yet information on CTZ-crossing civilian traffic was withheld on this occasion. This highlighted a culture that had developed at Brize where information on crossers is not routinely offered, reducing crew SA and eroding a key barrier.

Focused, example-driven HF training must be undertaken in parallel with a broader raising of awareness of local ATC regulations. The Brize Norton Flying Order Book currently makes no reference to CTZ crossers and ATC regulatory documentation is not accessible to aircrew. The ORG added new recommendations to attempt to build knowledge and tackle these shortfalls.

Finally, almost certainly driven by COVID, resource issues and raw workload, the ATC/Sqn LO⁹ network has broken down with a cost of the level of dialogue that would naturally build SA within controller expectation of routine type-specific flight profiles and procedures and deeper shared understanding of current concerns. The DDH RG felt that, ultimately, humans cause incidents and that communication, [air experience] flying where possible and strengthened relationships will induce a level of challenge that will help busy people identify when their own standards might have slipped.

HQ Air Command

This Airprox was subject to an OSI by trained investigators. The OSI summarises the outcomes, corresponding causal factors and makes appropriate recommendations. Whilst the findings of the OSI are valid, the Brize comments regarding the Bulldog pilot's non-compliance with Class D 'See and Avoid' rules deserve specific comment. The ATC Sqn BM Order book states "Responsibility for the separation of VFR flights from IFR flights within the CTR rests entirely with the VFR pilot. However, to aid flight safety at Brize Norton, controllers should aim to provide not less than 3nm or 500ft separation until the VFR air system is visual and can maintain visual separation with the IFR air system." Whilst the Bulldog pilot did see the Voyager in sufficient time to increase separation, unfortunately we do not know their thinking as to why they felt unable, or it unnecessary, to alter their flightpath once sighted with the Voyager. All parties (Voyager crew, Bulldog pilot and ATC controllers) had their own part to play in the sequence of events leading to this Airprox; however, had the Voyager pilot not been cleared through the Bulldog's level or had they been passed Traffic Information on the Bulldog giving them the opportunity to alter their intentions, it is highly likely this would not have resulted in an Airprox. There was much to learn from the Human Factors elements of this incident and the prevention of reoccurrence is being managed through a combination of sharing this experience, review of orders and training objectives and the publicising of this incident.

AOPA

The Bulldog pilot had been cleared to route from Faringdon to Burford by the Brize controller and so the pilot would have expected to fly that route with as little deviation as possible and within the clearance issued by the controller. We note that the Brize controller passed Traffic Information on the Voyager to the Bulldog pilot and that the Bulldog pilot stated that they were visual with the traffic about 1min 40sec later – approximately 40sec before the CPA – and passed nearly ½ mile in front of the Voyager as it climbed through the Bulldog pilot's cleared level. The Bulldog pilot, therefore, complied with their obligations to maintain adequate visual separation from the other aircraft.

It seems odd that Brize ATC would have cleared the Voyager pilot to climb through the Bulldog's cleared level without first confirming that the Bulldog pilot was visual with the Voyager, and this perhaps raises the question of the inferences in the terminology of Radar Control Service within Class D Airspace. It is noted the controllers do have a duty of care under CAP 774 and to provide

⁸ Occurrence Review Group.

⁹ Liaison Officer.

Traffic Information to both parties, which does not appear to have happened in this case as the Voyager pilot was not told about the Bulldog crossing the CTR.

Summary

An Airprox was reported when a Voyager and a Bulldog flew into proximity in the Brize Norton overhead at 1446Z on Tuesday 9th November 2021. The Voyager pilot was operating under IFR in VMC and was in receipt of an Radar Control Service from Brize Director. The Bulldog pilot was operating under VFR in VMC and was in receipt of a Radar Control Service from Brize Zone.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, radar photographs/video recordings, 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 Voyager pilot and noted that they had not been passed any Traffic Information by the Aerodrome controller regarding the Bulldog crossing the Brize CTR. The Board agreed, therefore, that the Voyager pilot had not had any situational awareness of the presence of the Bulldog when they commenced their climb-out from the visual circuit into the radar training circuit (**CF9**). However, members noted that the TCAS II equipment fitted to the Voyager had issued the crew with a TA (**CF10**) and agreed that this had likely alarmed the crew as they had not been expecting there to be any other traffic in proximity to their aircraft (**CF13**). The Board also agreed that the Voyager crew had not managed to sight the Bulldog until the aircraft's paths had already crossed (**CF12**), and so had been unable to take any action to visually ensure separation.

Turning to the actions of the Bulldog pilot, the Board heard from a GA pilot member that it is quite common for Brize controllers to route CTR-crossing aircraft between the Faringdon and Burford VRPs. In this case, the Bulldog pilot had been executing the controller's routing instructions and had been instructed to maintain a minimum altitude. The Board noted that Traffic Information on the Voyager had been passed to the Bulldog pilot by the Brize RA/Zone controller but members wondered if the Bulldog pilot had fully assimilated the implications of the Voyager climbing-out of the visual circuit. According to the timing of the Bulldog pilot's radio call confirming that they were visual with the Voyager, the Voyager had not yet started to climb and so the Board concluded that the Bulldog pilot had formed an inaccurate mental model of the Voyager's future flightpath (**CF9**). However, irrespective of the Voyager's subsequent climb, the Board did not agree with the findings of the Brize investigation that the Bulldog pilot '[did not] comply with Class D rules regarding 'see & avoid' resulting in [their] aircraft being in an unsafe position, with little time to react to the presence of the Voyager'. As defined in (UK) SERA 5005, pilots of aircraft operating under VFR in Class D airspace are required to maintain their own separation from other VFR flights and IFR flights; in the Board's view, the Bulldog pilot had met this requirement which, importantly, does not prescribe a minimum vertical or horizontal separation to be maintained. The Board agreed that the Bulldog pilot had been visual with the Voyager and had allowed sufficient VFR separation from it, and members noted that this appeared to be another example of the parameters for TCAS alerts not being consistent with VFR separation. The Voyager passed through the Bulldog pilot's cleared altitude approximately 2sec after radar CPA, at a range of 0.4NM and with a rate-of-climb reducing from ~4000fpm, and members considered it likely that this had also been the reason that no alert had been received from the Bulldog pilot's electronic conspicuity equipment (**CF11**).

The Board then considered the actions of the Brize Norton controllers. Controller members wondered why the local rules at Brize Norton regarding the passage of Traffic Information on aircraft crossing the CTR to pilots of aircraft in the visual circuit differed to those in use on MATZ crossers at most military airfields without Class D airspace. The Board noted that MAA RA3261(3) requires controllers to pass this information and so the Board agreed that, irrespective of whether the Voyager pilot was operating under VFR or IFR at the time, Traffic Information on the Bulldog should have been passed by the ADC and the fact that it was not passed had been contributory to the Airprox (**CF1**, **CF2**, **CF4**) because that information may have influenced the timing of the Voyager pilot's decision to transition from the visual

circuit to the radar training circuit. Members discussed the shared situational awareness amongst the Brize controllers and agreed that the RA/Zone controller had had all the information necessary for them to realise that the cleared transit altitude of the Bulldog would interfere with the cleared IFR climb issued to the Voyager pilot. However, neither the RA/Zone controller nor the ADC (who had also been passed the necessary information from the RA/Zone controller) had detected this conflict between the 2 clearances (CF6). Furthermore, because the Brize Director had not been passed information on the Bulldog by the RA/Zone controller (CF5), they had not had the necessary information to assist the RA/Zone controller in detecting the potential conflict. Members heard from a military controller member that a number of tools could have been used by the RA/Zone controller to ensure that the aircraft remained vertically separated, such as a climb-out restriction or the use of a 'blocking strip' which could have drawn the controller's attention to the fact that 2300ft altitude had been occupied by the Bulldog, but could not offer a reason as to why these methods had not been employed. Therefore, the Board agreed that the IFR clearance to climb to 2800ft, issued to the Voyager pilot by the RA/Zone controller (via the ADC), had contributed to the Airprox (CF7, CF8). The Board then discussed the role of the Supervisor and noted that they had been mid-handover to the oncoming Supervisor during the moments leading up to the Airprox. Whilst handovers clearly need to be conducted, members felt that, in this case, the Supervisor may have been better served pausing their handover until the Bulldog – with an unreliable height readout – had been laterally deconflicted from the Voyager, which may also have permitted them to notice that the IFR clearance issued to the Voyager pilot on leaving the visual circuit had been to climb through the altitude occupied by the Bulldog (CF3).

Finally, the Board considered the risk involved in this event. The Board noted that the Voyager pilot had assessed the risk of collision as 'High', but felt that this was probably due to the Voyager pilot being alarmed by a TCAS warning against traffic about which they had had no prior information. Members also noted that the Bulldog pilot had called visual with the Voyager approximately 40sec prior to CPA and that this had effectively removed any risk of collision. However, the Board did consider that safety had been degraded because, although the Bulldog pilot had ensured a lateral separation of nearly half a mile, the Voyager pilot had been cleared to climb through an occupied level on an IFR clearance. Therefore, the Board assigned a Risk Category C to this Airprox.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

2021228				
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
2	Human Factors	• ATM Regulatory Deviation	An event involving a deviation from an Air Traffic Management Regulation.	Regulations and/or procedures not fully complied with
• Manning and Equipment				
3	Human Factors	• ATM Leadership and Supervision	An event related to the leadership and supervision of ATM activities.	
• Situational Awareness and Action				
4	Human Factors	• ANS Traffic Information Provision	Provision of ANS traffic information	TI not provided, inaccurate, inadequate, or late
5	Human Factors	• ATM Coordination	Coordination related issues (external as well as internal)	
6	Human Factors	• Conflict Detection - Not Detected	An event involving Air Navigation Services conflict not being detected.	
7	Human Factors	• Inappropriate Clearance	An event involving the provision of an inappropriate clearance that led to an unsafe situation	
8	Human Factors	• Traffic Management Information Provision	An event involving traffic management information provision	The ANS instructions contributed to the Airprox
Flight Elements				

• Situational Awareness of the Conflicting Aircraft and Action				
9	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
• Electronic Warning System Operation and Compliance				
10	Contextual	• ACAS/TCAS TA	An event involving a genuine airborne collision avoidance system/traffic alert and collision avoidance system traffic advisory warning triggered	
11	Human Factors	• Response to Warning System	An event involving the incorrect response of flight crew following the operation of an aircraft warning system	CWS misinterpreted, not optimally actioned or CWS alert expected but none reported
• See and Avoid				
12	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
13	Human Factors	• Perception of Visual Information	Events involving flight crew incorrectly perceiving a situation visually and then taking the wrong course of action or path of movement	Pilot was concerned by the proximity of the other aircraft

Degree of Risk: C

Safety Barrier Assessment¹⁰

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 **ineffective** because there was no local procedure for the ADC to pass traffic information on CTR crossers to pilots of aircraft in the visual circuit (in accordance with MAA RA3261(3) para 64c and/or para 64e).

Manning and Equipment were assessed as **partially effective** because the ATC Supervisor was conducting a handover at the time of the Airprox and did not assimilate that the Voyager pilot had been cleared to climb through the level of the Bulldog.

Situational Awareness of the Confliction and Action were assessed as **ineffective** because the RA/Zone controller did not inform the Director controller about the Bulldog and neither the RA/Zone controller nor the ADC detected the potential confliction between the Voyager climbing-out and the Bulldog crossing the CTR.

Flight Elements:

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because the Voyager pilot had no situational awareness of the presence of the Bulldog, and the Bulldog pilot did not assimilate the implications of the Voyager climbing-out from the visual circuit.

¹⁰ 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: 2021228		Within Controlled Airspace						
Barrier		Provision	Application	Effectiveness				
				Barrier Weighting				
				0%	5%	10%	15%	20%
Ground Element	Regulations, Processes, Procedures and Compliance	!	×	[Red bar from 0% to 20%]				
	Manning & Equipment	✓	!	[Yellow bar from 0% to 15%]				
	Situational Awareness of the Confliction & Action	✓	×	[Red bar from 0% to 15%]				
	Electronic Warning System Operation and Compliance	●	●	[Grey bar from 0% to 10%]				
Flight Element	Regulations, Processes, Procedures and Compliance	✓	✓	[Green bar from 0% to 5%]				
	Tactical Planning and Execution	✓	✓	[Green bar from 0% to 5%]				
	Situational Awareness of the Conflicting Aircraft & Action	×	✓	[Red bar from 0% to 10%]				
	Electronic Warning System Operation and Compliance	✓	✓	[Green bar from 0% to 15%]				
	See & Avoid	✓	✓	[Green bar from 0% to 5%]				
Key:		<u>Full</u>	<u>Partial</u>	<u>None</u>	<u>Not Present/Not Assessable</u>	<u>Not Used</u>		
Provision	✓	!	×	●				
Application	✓	!	×	●	○			
Effectiveness	■	■	■	■	■			