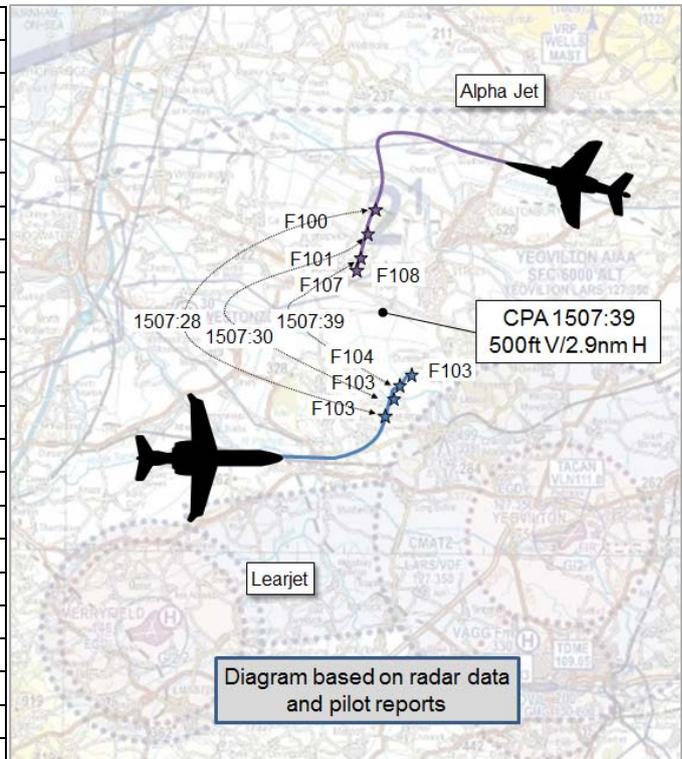


AIRPROX REPORT No 2017136

Date: 26 Jun 2017 Time: 1508Z Position: 5106N 00246W Location: 6nm NW Yeovilton

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Learjet	Alpha Jet
Operator	Civ Comm	MoD ATEC
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	Not reported
Service	Traffic	Traffic
Provider	Boscombe Down	Boscombe Down
Altitude/FL	F103	F108
Transponder	On/C, S	A, C
Reported		
Colours	White, Red	NK
Lighting	Strobe, Anti-Col	NK
Conditions	VMC	
Visibility	Not reported	
Altitude/FL	FL100	
Altimeter	QNH (1013hPa)	
Heading	090°	
Speed	180kt	
ACAS/TAS	TCAS II	TAS
Alert	RA	TA
Separation		
Reported	NK	NK
Recorded	500ft V/2.9nm H	



THE LEARJET PILOT reports that he thought he was heading east when he received one "Traffic" call from the TCAS system followed immediately by an RA "Climb, Climb" call from the TCAS. He started to pull back on the yoke when the RA changed to "Descend, Descend". Based on his SA he immediately started to turn away from where the traffic was indicating on his TCAS display, overbanking slightly. After rolling wings level from the turn he acquired the traffic visually in his left 8 o'clock high, in a left hand turn. He opined that at no time did he receive a traffic call from Boscombe radar. Both aircraft were operating under a Traffic Service. He did not see the Alpha Jet until it was behind him. [UKAB note: ATC passed Traffic Information to the Learjet at 3.4nm range to the Alpha Jet].

He assessed the risk of collision as 'High'.

THE ALPHA JET PILOT reports that he was conducting student GH and received a TA alert from his TAS which showed an aircraft within a mile, 300ft below. He conducted a positive climbing-turn away from the traffic whilst trying to gain visual. Up to the point of the TA, he thought that there were no calls from ATC, and the TAS unit was clear within 10nm with the 'XTD ON' mode selected which should show all traffic. [UKAB note: ATC did give TI to the Alpha Jet at 4.5nm range to the Learjet]. Just before the TA the student called TAS clear which he confirmed. Post the TA call, ATC notified them of the Learjet, and the crew of the Learjet informed them that they had had an RA. At this point there was also a second contact which appeared about 3nm, 3500ft below before disappearing from the display. The student in the backseat may have caught a glimpse of an aircraft below but over a mile away and can't be sure. Because they never positively saw the other aircraft, they are unsure of how close they got, hopefully the Radar reply will have this information. He opined that the unusual thing about this report is that both aircraft had clear TAS and TCAS II displays until the TA and RA alerts. They are unsure if they had an Airprox or if the TAS and TCAS units showed a false contact.

He assessed the risk of collision as 'Medium'.

THE BOSCOMBE CONTROLLER reports that his report was submitted after an Airprox was reported in the Boscombe TRA (triangle) via landline after the event by the Learjet pilot. He was the instructor controller behind a trainee in radar (TC Zone), with 2 aircraft in the Boscombe TRA, the Learjet and Alpha Jet. He and the trainee were engaged in a long-winded phone conversation with Western Radar to try and negotiate co-ordination against a track inbound to Bristol through the TRA. The radar range was selected to 70 miles in order to get a contact on this civil aircraft which was at the South of Portland DA. After the phone call, there was a discussion in the Approach Room between himself, the Approach controller, Supervisor and the trainee as to the legality of the co-ordination. The trainee then called the Learjet and Alpha Jet to each other. The Learjet reported on frequency getting a TCAS (RA) and questioned if the Alpha Jet had the Learjet on TCAS. The Alpha Jet responded with negative, until ATC had called the traffic.

He perceived the severity of the incident as 'Medium'.

Analysis and Investigation

Military ATM

Figures 1-4 show the positions of the Learjet and Alpha Jet at relevant times in the lead up to and during the Airprox. The screen shots are taken from a replay using the Burrington combined radar feed, which is not utilised by Boscombe Down ATC, therefore is not necessarily representative of the picture available to the controllers.

At 15:07:09 (Figure 1), the Learjet and Alpha Jet first began to turn towards each other.



Figure 1: Geometry at 15:07:10
(Learjet 2604; Alpha Jet 2606)

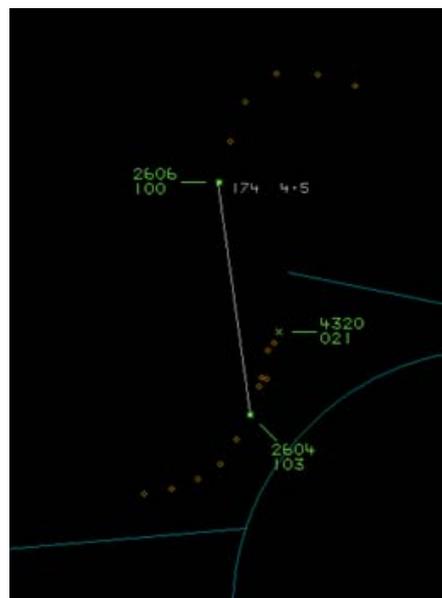


Figure 2: Geometry at 15:07:26

At 15:07:26 (Figure 2), the Boscombe Zone controller passed Traffic Information to the Alpha Jet on the Learjet as, "...traffic south, 8 miles, manoeuvring, indicating FL105, Learjet". The separation at the time was actually 4.5nm and 300ft.

At 15:07:38 (Figure 3), the Boscombe Zone controller passed Traffic Information to the Learjet on the Alpha Jet as "north west, 5 miles, manoeuvring, indicating FL105, Alpha Jet". The separation at the time was actually 3.4nm and 200ft.



Figure 3: Geometry at 15:07:38

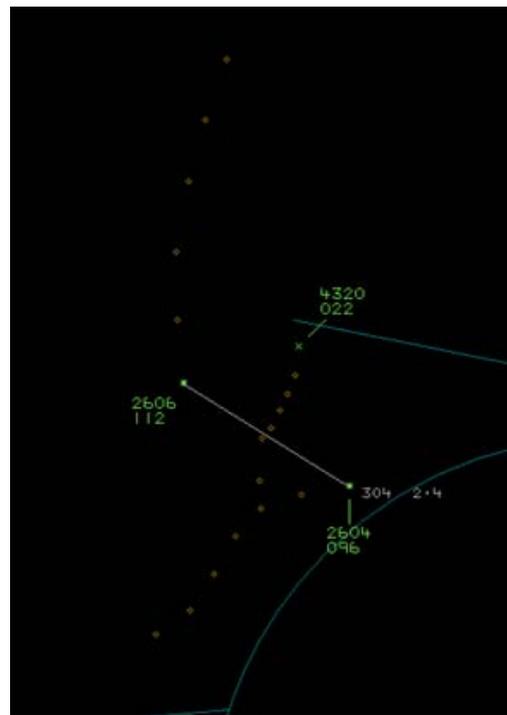


Figure 4: Geometry at 15:07:50

At 15:07:50 (Figure 4), the two aircraft were at their closest point laterally of approximately 2.4nm.

The Boscombe Zone controller was under training and had been involved, along with the Instructor and Supervisor, in a protracted landline conversation to create a deconfliction plan with Western Radar during the time leading up to the occurrence. There was subsequent discussion of the plan's legality, which may have caused enough distraction to delay passing Traffic Information to the two aircraft when they simultaneously turned towards each other with a high closing speed. Prior to the incident, the two aircraft had been operating far enough away from each other not to warrant Traffic Information. The callsign confusion by the Learjet, who responded to a Traffic Information call intended for the Alpha Jet, also increased the time it took for the Zone controller to pass Traffic Information to the Learjet.

The Zone controller's radar screen had been manipulated to a range 70nm in order to identify Portland traffic, which would have affected the controller's ability to monitor and judge distance, although it had been ranged back down to standard setting (range 40nm) at the time of the Airprox. In accordance with CAP 774, Traffic Information to aircraft receiving a TS should be passed by 5nm if the aircraft will pass within 3nm of each other. In this situation, the Traffic Information was inaccurate and late. Additionally, with high energy manoeuvres, it would be considered good practice to pass Traffic Information sooner to enable the pilot to have greater situational awareness when planning their next manoeuvre.

UKAB Secretariat

The Learjet and Alpha Jet 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.

Occurrence Investigation

¹ SERA.3205 Proximity.

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

The 2 aircraft involved (Learjet and Alpha Jet) were operating under a Traffic Service within the same airspace allocation. The Learjet was predominantly flying straight-and-level profiles at FL100 and the Alpha Jet was manoeuvring for General Flying Practice, commencing a loop. The aircraft closed sufficiently at FL105 for both aircrafts' TCAS/TAS to activate an RA/TA. The dynamic climbing profile of the Alpha Jet served to exacerbate the risk of closure due to the TCAS RA climb instruction of the Learjet. The TCAS RA in the Learjet responded effectively to the situation and the subsequent manoeuvring of the Learjet was sufficient to avoid a further degradation of safe separation.

The Alpha Jet pilot was aware from the sortie out-brief with the DSS [Duty Squadron Supervisor] that the Learjet was operating at FL100. Both aircraft operating at FL105 represented an increased risk of loss of safe separation. The mitigating barriers of ATC Traffic Service and TCAS/TAS were utilised by both crews. In this instance these barriers appear sufficiently effective to avoid a collision but not sufficiently effective to avoid the initial closure leading to the TCAS/TAS RA/TA activations.

The investigation made 2 Recommendations:

- It is recommended that a formalised deconfliction strategy is utilised by based aircraft planning to operate in the 'triangle' TRA.
- This incident should be used as a reminder to all crews of the known limitations of TCAS and TAS when utilised on small, fast and manoeuvring aircraft. Consideration should be given to formal system refresher training.

Comments

HQ Air Command

The crews of both aircraft involved in this incident were aware of the presence of the other aircraft in the intended area of operations prior to launch, though it appears that no formal deconfliction activity had taken place; this therefore places more reliance on other MAC barriers to prevent a loss of separation. It could not have been foreseen that a protracted (in excess of 2 minutes) coordination call with another ATC unit would have commanded the attention of the controller, instructor and supervisor and ultimately lead to a tardy and inaccurate issuance of TI, too late to affect the CPA. Furthermore, the crews might possibly have expected the TCAS II and TAS to have given a much earlier warning of proximate traffic than was the case here – this is probably explained by the manoeuvring of the Alpha Jet, whose flight vector would not have triggered a warning until the aircraft were in reasonably close proximity and the vectors of the 2 aircraft were converging.

The investigation conducted by the unit into this incident recommended that a formalised deconfliction strategy be developed for aircraft planning to operate in the same area and that crews be reminded of the limitations of their respective CWS when one or both of the aircraft are conducting high energy manoeuvres. It is also worth highlighting the detrimental effect of the distracting telephone call on the delivery of accurate and timely TI. Distractions are not limited to controllers alone and this incident serves as a salutary reminder of how easy it is to become distracted, and how difficult that it is to recognise and then extract oneself from the distraction.

Summary

An Airprox was reported when a Learjet and an Alpha Jet flew into proximity at 1508 on Monday 26th June 2017. Both pilots were operating under VFR in VMC, both pilots in receipt of a Traffic Service from Boscombe Down.

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, radar photographs/video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

The Board first began by discussing the actions of the Boscombe radar controller. The Board noted that the controller was carrying out coordination with an adjacent unit and, because this was further away than normal, a radar display range of 70nm had been set rather than the usual range 40nm. As a result, the trainee controller and his instructor could not fully monitor the Learjet and Alpha Jet. When the coordination was complete, they returned their attention to the Alpha Jet and Learjet and the trainee passed TI. Unfortunately, because they had not returned the radar range to the normal setting at this point, the stated TI range was misinterpreted and this may have resulted in flawed pilot SA. That being said, members noted that neither of the pilots recalled being given TI anyway, and so this was rather a moot point. Nonetheless, Board members agreed that the protracted coordination and associated change of radar range had resulted in late and inaccurate passage of TI. Irrespective of the coordination and display-setting issue, ATC members were surprised that the Boscombe controller had not anyway reminded the Learjet and Alpha Jet pilots of each other's presence as they were operating in the same area.

The Board then turned to the actions of the pilots. For his part, members noted that the Alpha Jet pilot had carried on manoeuvring towards the Learjet even though he had been given TI about it. Some members commented that because the TI had been inaccurate, he may have been operating with flawed SA in the belief that the Learjet was further away than it actually was. Other members noted that the Learjet pilot had reported that he hadn't received any TI at all, and wondered whether he had missed the transmission. Finally, the Board opined that both pilots may have been over-reliant on both ATC and their electronic warning systems to the detriment of mutual tactical planning. They were surprised that both aircraft were from the same operating authority yet had not ensured that they had a robust deconfliction plan from each other. In this respect, members were heartened to hear that the operating authority will now ensure that all their aircraft are positively deconflicted in future.

With regard to the lack of TCAS indications in either aircraft until just before the encounter, members were informed that the Alpha Jet's high rates of climb and descent during looping manoeuvres may have initially exceeded the TCAS display algorithms (which require target rate of climb/descent to be less than +/- 10,000fpm), but that during the 2mins prior to CPA, the Alpha Jet appeared to be within this tolerance and so should have been displayed. Without knowledge of the Alpha Jet's TAS system, members could not speculate as to why the 2 aircraft did not appear as at least proximate traffic to each other within this time period.

The Board then considered the cause and risk of the incident. Members agreed that the protracted ATC coordination had been contributory in that ATC was distracted to the extent that timely and accurate TI was not passed under the terms of the Traffic Service. Notwithstanding, the Board agreed that the Learjet and Alpha Jet pilots had both taken effective action to remain sufficiently separated, and that the incident was probably best described as the Learjet pilot being concerned by the proximity of the Alpha Jet. The Board agreed that, although safety had been degraded, the aircraft were separated by 500ft and 2.9nm at CPA and so there was no risk of collision. Accordingly, they assessed the risk as Category C.

PART C: ASSESSMENT OF CAUSE AND RISK

<u>Cause:</u>	The Learjet pilot was concerned by the proximity of the Alpha Jet.
<u>Contributory Factor:</u>	ATC was distracted to the extent that timely Traffic Information was not passed.
<u>Degree of Risk:</u>	C.

Safety Barrier Assessment³

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

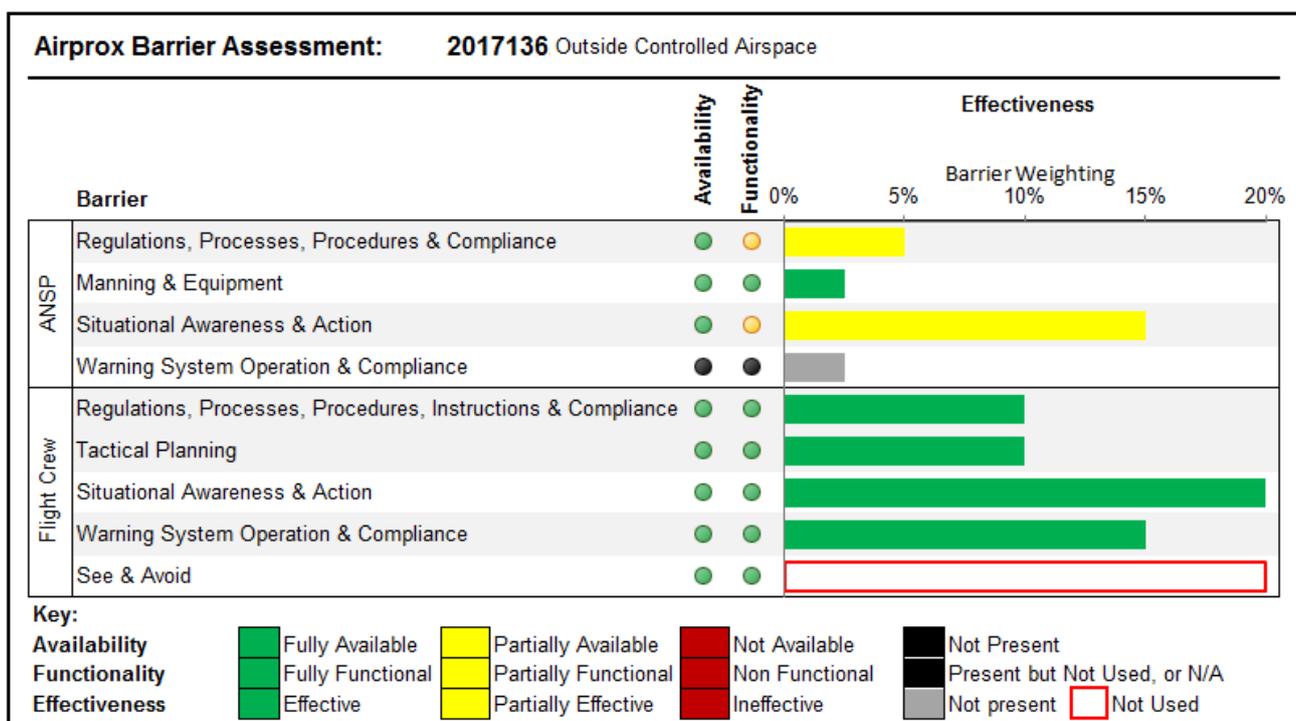
ANSP

Regulations, Processes, Procedures & Compliance was assessed as **partially effective** because the controller passed TI to the pilots later than required, with inaccurate ranges.

Situational Awareness & Action was assessed as **partially effective** because the controller changed his display-scale range and was distracted by the protracted coordination telephone call.

Flight Crew

See and Avoid was assessed as **not used** because the aircraft were safely separated before they were close enough to require the 'See and Avoid' barrier.



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