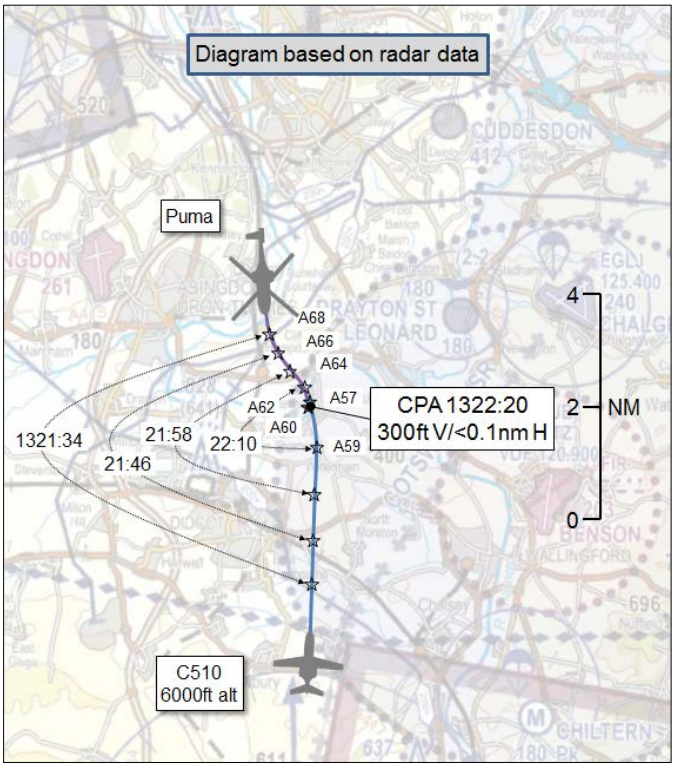
AIRPROX REPORT No 2017162

Date: 13 Jul 2017 Time: 1322Z Position: 5138N 00113W Location: 10nm S Oxford airport

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	C510	Puma
Operator	Civ Comm	HQ JHC
Airspace	London FIR	London FIR
Class	G	G
Rules	IFR	VFR
Service	No service agreed	Traffic
Provider	Oxford	Benson
Altitude/FL	5700ft	6100ft
Transponder	A,C,S	A,C,S
Reported		
Colours	White	Green
Lighting	NK	Strobes, nav
Conditions	IMC[1]	VMC
Visibility	10km	10km
Altitude/FL	6000ft	6300ft
Altimeter	QNH (1021hPa)	QNH (1022hPa)
Heading	360°	180°
Speed	235kt	70kt
ACAS/TAS	TCAS I	TAS
Alert	TA	TA
Separation		
Reported	'300ft'	200ft V/0 ft H
Recorded	300ft V/<0.1nm H	



THE CESSNA 510 MUSTANG PILOT reports being 10nm south of the Oxford (OX) NDB maintaining 6000ft, heading 360°, in receipt of a Radar Control Service [he reported] from Oxford. A TCAS TA was observed by both pilots followed by an audio warning. The PF sighted an aircraft 12 o'clock at about 0.5nm, 300ft above, descending. The risk of collision was deemed high and immediate avoiding action was taken by disconnecting the autopilot and commencing a descending left turn. Simultaneously, ATC instructed an immediate right turn to avoid. Once clear of the conflict the autopilot was re-engaged and the aircraft was returned to 6000ft, heading 360°. ATC then confirmed that the traffic was with Benson and had been coordinated not below 7000ft.

He assessed the risk of collision as 'High'.

THE PUMA PILOT reports that they had just completed an air-test northwest of Benson under a Traffic Service. At approx 6700ft in the descent for recovery, Benson ATC asked if they could maintain above FL70 to deconflict from Oxford traffic. Because of cloud and low OAT this was not possible, so the crew informed ATC of this and added that the air-test was complete and that they were ready for recovery to Benson. ATC then spoke to another pilot as they continued their descent. The next ATC call again requested them to descend not below FL70 but, because they were already at about 6300ft, they stated again that this was not possible. The controller then gave an immediate right-hand turn onto heading 270°. At the same time, the aircraft's TAS declared a conflict "12 o'clock 1 mile" and the crew became visual with a small business jet at a range of less than 1nm, reciprocal heading, approximately 200ft below. The aircraft passed below them before their turn was completed. They confirmed visual with the traffic and continued recovery to Benson.

[1] Clear of cloud at the Airprox position.

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

THE BENSON RADAR/DIRECTOR CONTROLLER reports that the Puma pilot was conducting an air-test to the west of Benson. He was also controlling a Tutor pilot operating to the northwest of Benson. Airspace was congested due to RIAT (Fairford Air Tattoo) CAS, resulting in traffic being funnelled into a small area. The Puma pilot was operating above 7000ft when Oxford called for coordination with their inbound traffic. At the time there was no conflict with the Puma; however, as it was the closest aircraft to the Oxford traffic, he elected to arrange a course of action with them before the Tutor. He requested that the Puma operate not below FL70 but they elected not to comply and furthermore started descending. The protracted nature of this and the discussion with Oxford led to some distraction. He called the traffic approximately 1nm away and suggested a turn to the west to ensure separation. The Puma pilot called visual with the Oxford traffic. An Airprox was only declared by subsequent telephone call and not on the frequency.

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

THE BENSON SUPERVISOR reports that the Approach controller was working a Tutor pilot operating over the Vale and a Puma pilot on an air-test, also operating over the Vale. He did not witness the incident and was alerted to what had happened by the crew of the Puma telephoning ATC after they had landed. He then instigated a tape transcript to review events.

THE OXFORD APPROACH RADAR CONTROLLER reports that, at 1319, the C510 pilot came on frequency descending to 6000ft. They were instructed to leave CPT heading north. In the meantime, 2 Benson tracks were observed manoeuvring to the north of the C510's position by about 8nm. A telephone call was made to Benson to request Traffic Information. The Oxford controller was told that one of the tracks was a Puma on an air-test at FL75 and he requested coordination not below FL70 on that traffic against the C510 which was then at 6000ft. The telephone call was passed to another Benson controller and it was necessary to go through the process all over again. This controller said that the Puma was recovering to Benson but that they would maintain FL70 until they were 3nm from the C510. The Oxford controller then requested further Traffic Information and subsequent coordination not above 5000ft against the 2nd track which was a Tutor general handling. In the process of trying to achieve all this there were numerous other calls from pilots requesting a service outbound/transit/recovery/inbound. The Puma was then suddenly spotted heading towards the C510 descending, and Traffic Information and avoiding action was issued to the C510 pilot. They had already spotted the Puma and had commenced avoiding action and descent themselves. The C510 pilot called clear of the traffic and that they were continuing north and climbing again. The Benson controller had also given avoiding action to the Puma pilot and advised that the Puma pilot was visual with the C510 and made some comment saying it was too fast for their guys. The C510 pilot then continued to land at Oxford.

Factual Background

The weather at Oxford was recorded as follows:

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METAR EGTK 131320Z VRB03KT 9999 SCT043 20/10 Q1021=
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Analysis and Investigation

CAA ATSI

ATSI had access to reports from the pilots of the C510 and the Puma, as well as the Oxford and Benson controllers involved. The area radar recording was reviewed along with the radio recording of the Oxford Approach frequency and the relevant telephone calls made from the Oxford Radar control position. Radio recording of the Benson frequency was not available to ATSI. Screenshots produced in this report are provided using recordings of the local area radar. Levels indicated are Flight Levels (FL). All times UTC.

The C510 was an IFR commercial flight to Oxford, talking to Oxford Radar at the time of the Airprox. The pilot and controller did not enter into a verbal agreement as to the type of service required or provided. From the content of the controller report, it was established that the controller believed that a Traffic Service was being provided. It could not be ascertained from the pilot report what type of service the pilot believed they were in receipt of. This report has been prepared on the assumption that a Traffic Service was being provided.

At 1319:10, the C510 pilot checked in with Oxford Radar (transponder code 1227) and advised the controller that they were descending to altitude 6000ft on QNH 1021hPa. The controller advised that he would provide vectors for the ILS RW19, and issued an instruction to leave Compton heading north (Figure 1).

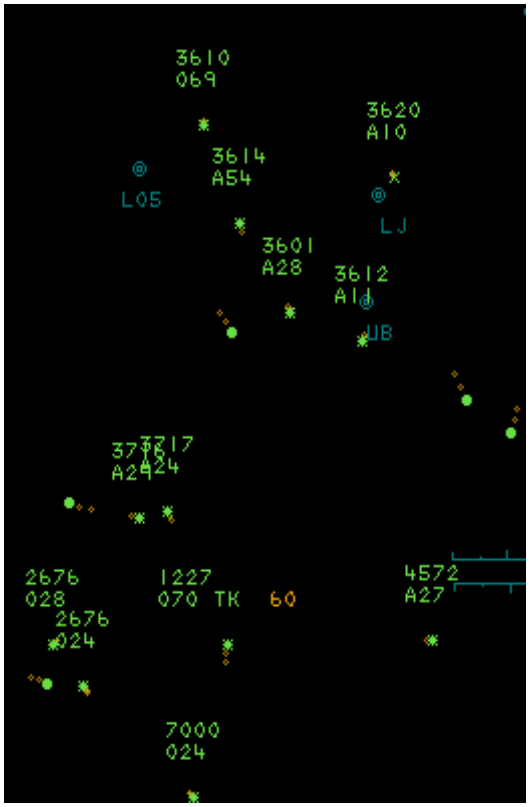

Figure 1 – 1319:10 (Puma 3610; C510 1227.

At 1320:0, the Oxford radar controller called Benson ATC and requested Traffic Information on the Puma, (transponder code 3610). Benson ATC advised them to standby for the Approach controller. When the Benson Approach controller came on the line he responded that the Puma was on an air-test and operating up to 7500ft. The Oxford controller requested coordination of not below FL70 against the C510 which was north of Compton by 3nm at 6000ft. The Benson controller was heard passing this request to the Puma pilot. The response from the Puma pilot on the UHF frequency could not be heard. At the time, the radar replay showed the Puma's Mode C was indicating FL74. The Benson controller returned to the conversation with the Oxford controller and advised that the Puma was now recovering to Benson. This was a very lengthy and protracted telephone call involving further coordination with a second aircraft, a Tutor (3614 squawk) and several interruptions from other aircraft calling. As a result of the protracted conversation, the telephone line remained open throughout the duration of the incident.

The telephone call concluded at 1321:30 at which point the controllers believed coordination agreement had been reached, that the Puma would maintain not below FL70 until 3nm separation was achieved between the two aircraft. However, the Puma was now displayed as being at FL67 (Figure 2).

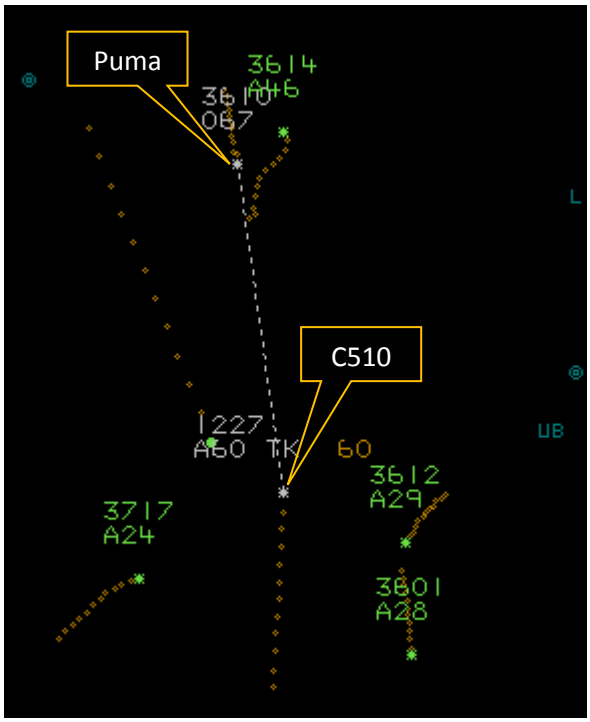

Figure 2 – 1321:30.

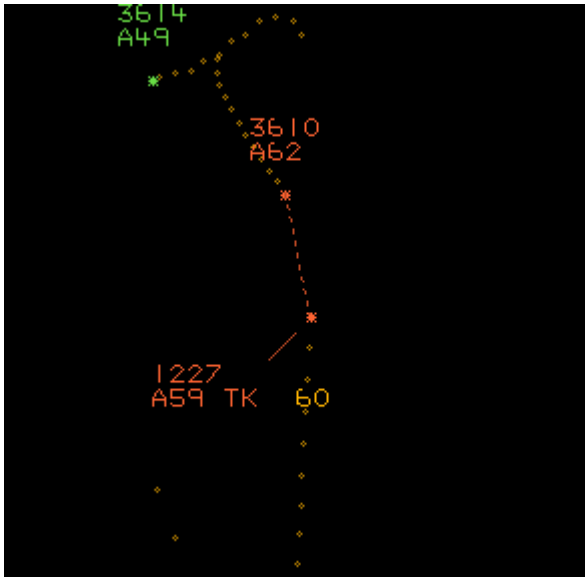

Figure 3 – 1322:10.

At 1322:10 the Oxford controller advised the C510 pilot that they were trying to coordinate and passed Traffic Information on the Puma as 12 o'clock, at a range of 2nm, at 6200ft, together with an instruction to turn right immediately heading 100°. The Benson controller was then heard passing Traffic Information to the Puma pilot on the C510 as fast moving traffic 12 o'clock and advised a right turn to avoid (Figure 3).

At 1322:23 CPA took place; the C510 pilot reported visual with the Puma and advised the Oxford controller that they had turned left and were now descending (Figure 4).

At 1322:40 the C510 pilot reported clear of the Puma and resuming a heading of 360°. The controller apologised and advised that the Puma had been coordinated not below FL70. The C510 pilot continued the approach to land without further incident.

The C510 pilot did not specify the type of service they required from the Oxford controller and the controller did not ask the pilot to specify the type of service required. It has been ascertained from the controller report that the controller believed that they were providing a Traffic Service. It could not be ascertained what type of service the pilot of the C510 believed that they were receiving.

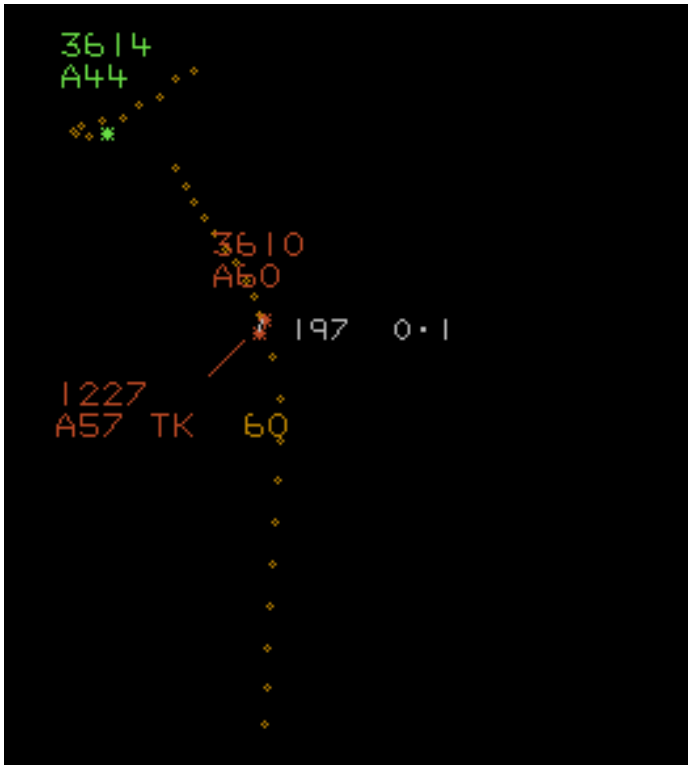

Figure 4 – 1322:23.

The Oxford UK AIP entry concerning ATS Service Provision states as follows:

> 'The standard service provision at Oxford during the promulgated radar hours is a Traffic Service due to intense GA and glider flying within the vicinity of the aerodrome. Aircraft requiring a deconfliction service shall inform Oxford Radar on first contact when inbound, and prior to taxiing when outbound. Aircraft operating on a deconfliction service may incur delays.'

The C510 was in the descent to altitude 6000ft and was instructed to leave Compton heading north. The heading of north took the C510 into confliction with a Tutor aircraft and the Puma.

CAP 493 Section 1, Chapter 12, Paragraph 3f states:

> 'When providing headings/levels for the purpose of positioning and/or sequencing or as navigational assistance, the controller should take into account traffic in the immediate vicinity based on the aircraft's relative speeds and closure rates, so that a risk of collision is not knowingly introduced by the instructions passed. However, the controller is not required to achieve defined deconfliction minima and pilots remain responsible for collision avoidance even when being provided with headings/levels by ATC.'

The Puma pilot had been conducting a local air test. The Benson controller requested coordination with the pilot to maintain not below FL70. The coordination call took too long to achieve and the Puma was already indicating FL67 when the request to maintain FL70 was received. In response to the request, the pilot requested recovery to Benson. The radar replay then displayed the Puma as continuing the descent to FL60 at CPA.

The belief that coordination was going to be achieved resulted in very late Traffic Information being passed to the C510 pilot by the Oxford controller when they realised that the Puma had descended below FL70. The C510 pilot responded to the Traffic Information and advised that they were already visual with the Puma, turning left and descending to avoid.

The Oxford controller believed that they were providing a Traffic Service to the C510 pilot and issued an initial heading that brought the C510 into confliction with the Puma probably in the expectation that effective and timely coordination would be achieved with the Benson controller (i.e. that the Puma would operate not below FL70 until lateral separation of 3nm was achieved). As a result of the protracted coordination telephone call, late Traffic Information was then passed to the C510 pilot, together with an instruction to turn right immediately, at which point an avoiding action left turn and descent had already been initiated by the crew of the C510. The confliction occurred whilst both aircraft were within Class G Airspace, where pilots are responsible for their own collision avoidance.

Military ATM

Figures 5-10 show the positions of the Puma and C510 at relevant times in the lead up to and during the Airprox. The screen shots are taken from a replay using the Heathrow H10 radar, which is not used by Benson ATC and therefore is not necessarily representative of the picture available to the controllers.

At 1321:04 (Figure 5), the Benson Approach Controller made a request to the Puma pilot to maintain not below FL70 for coordination with Oxford. The Puma pilot responded that the air-test was complete and the aircraft was ready for recovery but did not agree with the controller's request.

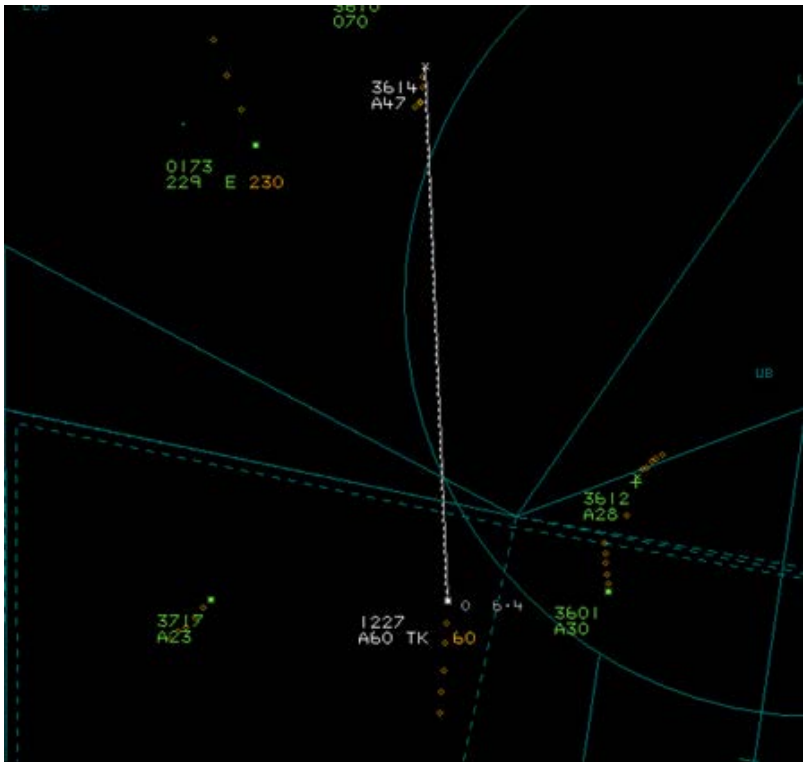

Figure 5: Geometry at 1321:04 (Puma 3610; C510 1227).

At 1321:37 (Figure 6), the Benson Approach Controller began passing a message to a Tutor pilot also on frequency in order to effect coordination.

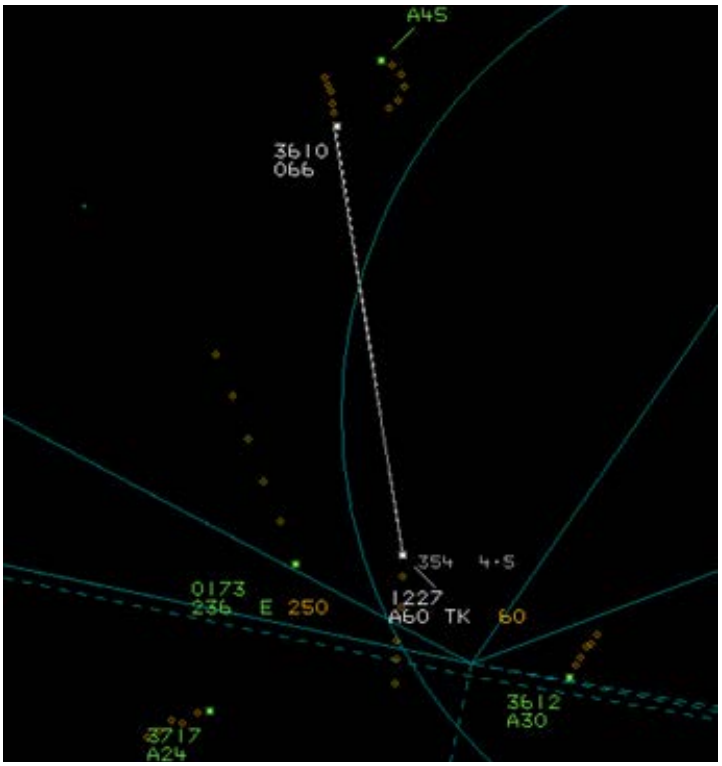

Figure 6: Geometry at 1321:37 (Puma 3610; C510 1227).

At 1321:50 (Figure 7), the Benson Approach Controller informed the Puma pilot that the fast-moving traffic would shortly be passing and that he would give a descent instruction once the traffic was clear. The controller was referring to the C510, which was the aircraft he was trying to achieve coordination against; however, the Puma pilot had already commenced a descent

inbound to Benson without notifying the controller[2]. The Puma pilot responded that the aircraft was at 6500ft and not able to climb to FL70 due to controlled airspace restrictions above.

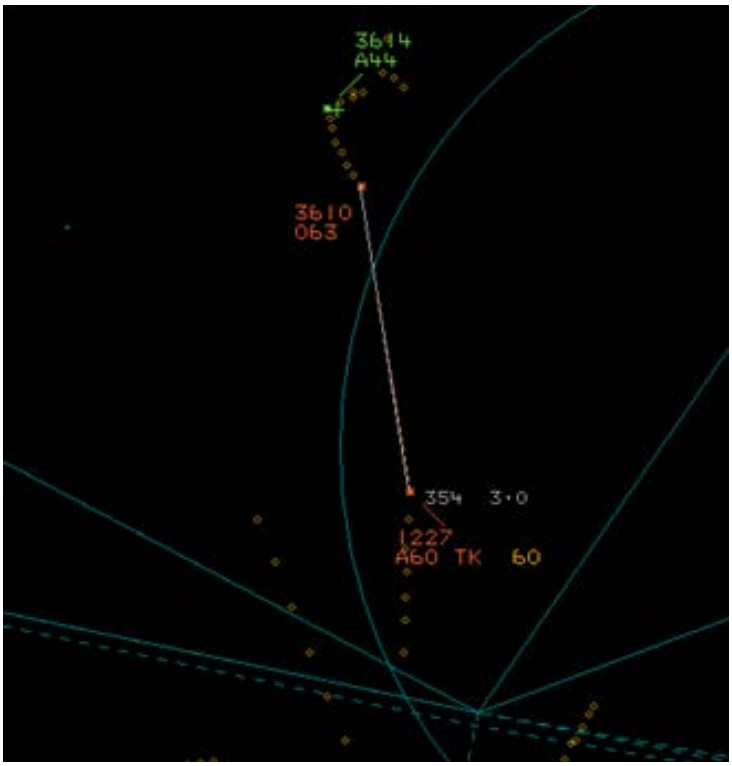

Figure 7: Geometry at 1321:50 (Puma 3610; C510 1227).

At 1322:10 (Figure 8), the Benson Approach Controller suggested a right turn onto heading 270° in order for the Puma to avoid the C510 (believed to still be attempting to comply with the coordination). Traffic Information was passed to the Puma pilot as "south of you, range of one mile and 300ft below.

Figure 8: Geometry at 1322:10 (Puma 3610; C510 1227).

[2] CAP774, Chapter 3, Paragraph 3.11, states: *'Unless safety is likely to be compromised, a pilot shall not change level or level band without first advising and obtaining a response from the controller, as the aircraft may be co-ordinated against other airspace users without recourse to the pilot'.*

At 1322:18 (Figure 9), the Puma pilot reported visual with the C510 traffic.

Figure 9: Geometry at 1322:18 (Puma 3610; C510 1227).

At 1322:19 (Figure 10), the Puma and C510 passed at a recorded CPA of 0.2nm and 400ft.

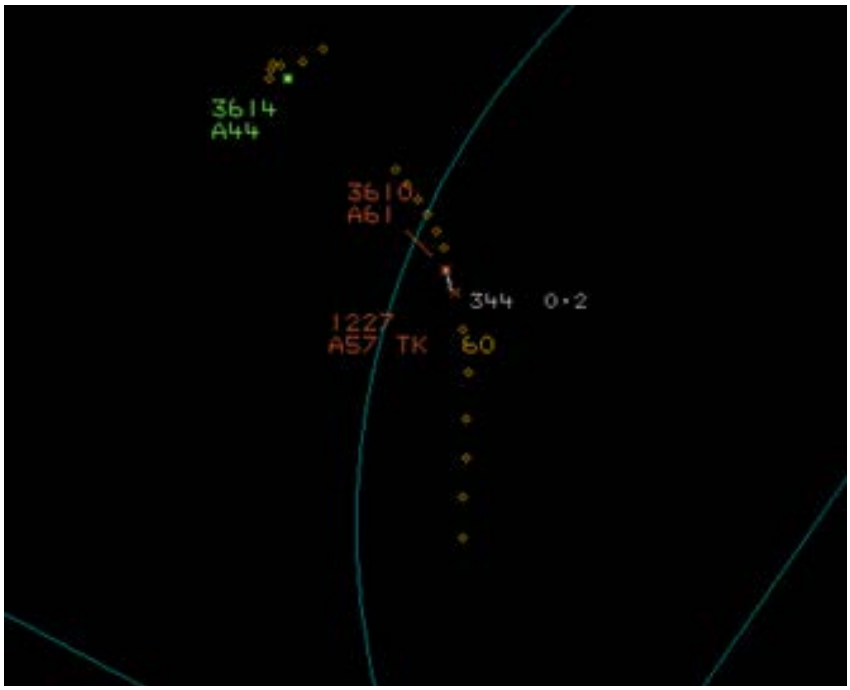

Figure 10: Geometry at 1322:19 (Puma 3610; C510 1227).

The Oxford Radar Controller called the Benson App Controller to request Traffic Information on the Puma, though the standard process of confirming the position of the traffic for identification was not followed. Once the Benson App Controller had stated that the Puma was conducting an air-test and operating up to approximately 7500ft, he anticipated that the Oxford Radar Controller required coordination and asked “what do you need?”, to which the Oxford Radar Controller replied “not below FL70”, while pointing out his C510 traffic. The word ‘coordination’ was never

used and the Oxford Radar controller did not declare the altitude of the C510. The Benson App Controller attempted to get an agreement from the Puma pilot to operate not below FL70; however, the pilot only responded that the air test was complete and that they were ready for recovery, which would imply ready for descent. The Benson App Controller informed the Oxford Radar Controller that the Puma was ready for recovery and agreed to keep the aircraft not below FL70 until 3nm clear of the C510, despite not having the Puma pilot's agreement to comply. The Benson App Controller then turned to his other traffic, a Tutor, asking the pilot to operate not above 5000ft (1021HPa) for coordination, which the pilot agreed. The Benson App Controller informed the Puma pilot that the fast-moving traffic would shortly be passing and requested that the aircraft remain not below FL70 until 3nm clear. Standard phraseology for Traffic Information was not used, and coordination still not agreed. In fact, the Puma had already begun descent and reported being at 6500ft (1021HPa), unable to climb to FL70 due to airspace restrictions. The Benson App Controller suggested that the Puma pilot turn right onto heading 270° to avoid the C510, describing its position as south by 1nm, 300ft below. The Puma pilot reported visual with the C510 with 0.6nm and 300ft separation. This was relayed to the Oxford Radar Controller, who was still on the landline.

With the Puma operating under a Traffic Service, the Benson App Controller did not need to achieve any deconfliction minima and the Puma pilot was under no obligation to agree to coordination, despite the Oxford Radar Controller's request. The Benson App Controller was required to pass [timely] Traffic Information to the Puma pilot, iaw CAP 774, which he did not do. This may be due to being distracted in agreeing coordination with the Tutor and then trying again with the Puma pilot and perhaps believing that he would be maintaining 1000ft separation between the Puma and the C510. Although the Benson App Controller was trying to be helpful to the Oxford Radar Controller by asking his traffic to remain not below/above altitudes that would enable 1000ft separation between them and the C510, the standard coordination process between controllers was not followed and was therefore not legal. Without the Puma pilot's agreement, the Benson App Controller should not have told the Oxford Radar Controller that the Puma would remain not below FL70 until 3nm clear.

UKAB Secretariat

The C510 and Puma pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard[3]. Because the incident geometry is considered as head-on or nearly so then both pilots were required to turn to the right[4], notwithstanding their primary responsibility to avoid collision.

Summary

An Airprox was reported when a C510 and a Puma flew into proximity at 1322 on Thursday 13th July 2017. The C510 pilot was operating under IFR in IMC in contact with Oxford, no agreement had been reached on the type of ATC Service being provided. The Puma pilot was operating under VFR in VMC, in receipt of a Traffic Service from Benson.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from both pilots, the controllers concerned, area radar recordings and reports from the appropriate ATC and operating authorities.

The Board first began by discussing the actions of the Puma pilot. The Board noted that he had been carrying out an air-test under VFR in receipt of a Traffic Service from Benson. Although a recording of the Puma pilot's initial RT calls was not available, the JHC member reported, using his experience of operating from Benson, that it was highly likely that he had been cleared to operate in a level band probably from 2000ft to FL75. He was sure that they would not have been allocated a fixed level due

[3] SERA.3205 Proximity.
[4] SERA.3210 Right-of-way (c)(1) Approaching head-on.

to the nature of their task which would have involved numerous level changes. Consequently, because he was probably not restricted to a set level, there was no requirement to inform ATC when he commenced descent, as would have been necessary under a Traffic Service from a cleared level. Subsequently, when asked to climb back to FL70, he reported that he was unable due to controlled airspace above but the JHC member commented that he had meant to say it was not possible due to the cloud conditions above and the risk of icing.

The Board then turned their attention to the controllers' actions. The C510 was inbound under IFR to Oxford. On his initial RT call Oxford had cleared the pilot to leave CPT heading 360°, descending to 6000ft, for vectors to an ILS approach to RW19. The RT recording confirmed that no agreement was reached regarding the type of ATC service being provided but the controller reported that he was providing a Traffic Service to the C510 pilot. This was in accordance with the information included in the Oxford section of the UK AIP, which states that *'The standard service provision at Oxford during the promulgated radar hours is a Traffic Service. Aircraft requiring a Deconfliction Service shall inform Oxford Radar on first contact when inbound.'* The C510 pilot had not requested which ATC Service he had required but the C510 pilot had stated in his report that he had been in receipt of a Radar Control Service. Board members generally considered that this probably referred to that part of the flight whilst he was in Controlled Airspace (CAS), but some members wondered if it was indicative that he was unsure of the type of service he could expect outside CAS. In this respect it was pointed out that his operating company were used to operating into Oxford airport and the C510 pilot would probably have been aware that, at the time of the Airprox, he would not have been in receipt of a Radar Control Service.

The Board noted that the initial heading issued to the C510 pilot by Oxford had pointed the aircraft towards two aircraft squawking Benson SSR codes, one at FL69 (the Puma) and the other 5400ft (a Tutor). The C510 was passing FL70 at the time. It is not known if the Oxford controller had been aware of the Benson traffic when issuing the 360° heading but about one minute later the Oxford controller telephoned Benson and requested information about the Puma. Benson informed the Oxford controller that the Puma was operating up to about 7500ft and asked *"what do you need".* The Oxford controller requested that the Puma be not below FL70 against the C510. The RT recording reveals that the Benson controller did ask the Puma pilot if he could maintain FL70 until advised, but he had responded that he had completed the air test and was ready for recovery. The Board noted that he had not confirmed any agreement to maintain FL70 and the Board considered that a contributory cause to the Airprox was that the Benson controller did not achieve a coordination agreement with the Puma pilot but led the Oxford controller to believe that he had. The Benson controller informed the Oxford controller that *"they're going to recover so if I get them working um maintaining at seven zero until you're three miles then come on in"*. The Board opined that the Oxford controller, on receiving this message, believed that coordination had been agreed despite the standard phraseology for coordination not having taken place. The phrase 'request coordination'[5] was not used nor was the agreed coordination read back[6] as required in MATS Part 1. By the time the Oxford controller believed that an agreement had been made for the Puma pilot to remain not below FL70, the Puma pilot had already commenced his descent presumably not noticed by either controller. The Benson controller had, subsequently, requested the Puma pilot to maintain FL70 when he issued Traffic Information about the C510. The Puma pilot responded that he was passing 6500ft. The Oxford controller passed avoiding action to the C510 pilot at a late stage after realising that the Puma was descending through 6200ft.

There then followed a lengthy discussion about whether the Oxford controller's actions had been appropriate. Several Board members wondered why the Oxford controller, who was reportedly providing a Traffic Service to the C510 pilot, thought that they needed to arrange coordination to provide separation between the C510 and the Puma. In fact Controller members believed that, taking into account a closing speed of 300kt, it would not have been practical to achieve coordination, and thereby separation, in the time available. In reality, the telephone call had been protracted and had distracted both controllers from passing timely Traffic Information to their respective pilots. This late

[5] CAP 493, Section 1, Chapter 11, Request Co-ordination, Paragraph 3.1(1).
[6] CAP 493, Appendix E, Communications Technique and Standard Phraseology, Paragraph 4A.1.

Traffic Information from both controllers was considered to be a contributory factor and the Board considered that if the Oxford controller had deemed it necessary to separate the two aircraft it would have been more practical, in the time available, to have issued the C510 pilot with an early avoiding heading as well as issuing timely Traffic Information. Nevertheless, if the Puma had agreed with Benson that he had been able to maintain FL70, a separation of 1000ft vertical and 3nm horizontal would have been achieved although it was noted that there was no requirement to achieve defined deconfliction minima under a Traffic Service.

The Board then turned its attention to the cause of the Airprox. Members acknowledged that because both pilots were operating in Class G airspace it was ultimately their responsibility to 'see-and-avoid' each other irrespective of ATC involvement. The Board noted the MATS Part 1 procedures that stated under a Traffic Service *"When providing headings/levels for the purpose of positioning and/or sequencing… the controller should take into account traffic in the immediate vicinity based on the aircraft's relative speeds and closure rates, so that a risk of a collision is not knowingly introduced by the instructions passed"*. The Board considered that these conditions were relevant to the circumstances of this Airprox. Although the Oxford controller may not have initially been aware of the position of the potentially conflicting traffic when allocating a heading to the C510 pilot, it was apparent that the potential confliction was soon recognised because the controller had attempted to take action which would have separated the two aircraft. Consequently, members agreed that, even though the Oxford controller had tried to rectify the situation, the Airprox was caused because the Oxford controller vectored the C510 into conflict with the Puma.

Turning to the risk, it was noted by the Board that the C510 pilot, having received a TCAS TA, observed the Puma at about 0.5nm, 300ft above, and took avoiding action. The Puma pilot also received a TCAS TA and observed the C510 at less than 1nm, approximately 200ft below. It was also noted that the Benson controller had suggested an avoiding action turn, which was not completed before the two aircraft had passed. The C510 crew thought that the Puma pilot had not seen them before they had engaged their avoiding action. Both pilots had reported that the risk of a collision had been high and, taking into account the late sighting and avoiding action, together with the CPA being 0.1nm horizontal and 300ft vertical, the Board quickly decided that the Airprox should be assessed as Category B (safety much reduced below the norm).

PART C: ASSESSMENT OF CAUSE, RISK AND SAFETY BARRIERS

Cause: The Oxford controller vectored the C510 into conflict with the Puma.

Contributory Factors: 1) The Benson controller did not achieve coordination agreement with the Puma pilot.

2) Late Traffic Information from both controllers

Degree of Risk: B.

Safety Barrier Assessment[7]

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 and Compliance were considered as **ineffective** because the coordination between Oxford and Benson was not carried out using the correct phraseology and the Benson controller did not check whether the Puma pilot would maintain FL70; this led to an erroneous belief by Oxford that coordination had been fully agreed.

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

Situational Awareness and Action were assessed as **partially ineffective.** Because of the ambiguous and protracted coordination effort, the controllers were only aware of the potential confliction between the two aircraft at a late stage.

Flight Crew:

See and Avoid was **partially effective** because both pilots obtained only a late sighting of the other aircraft and were only able to take late avoiding action.