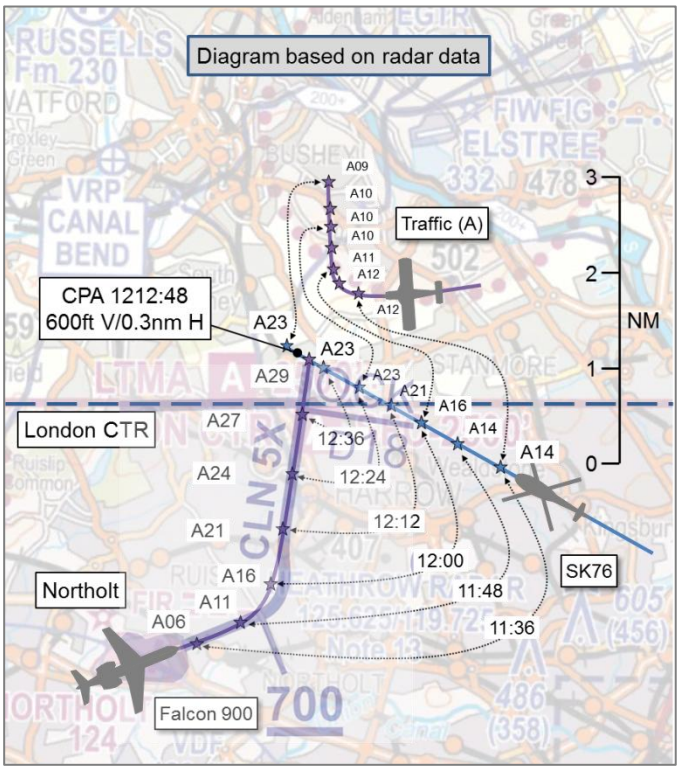
AIRPROX REPORT No 2014170

Date/Time: 11 Sep 2014 1213Z

Position: 5137N 00022W (London)

Airspace: London FIR (*Class*: G/A)
London TMA

	Aircraft 1	*Aircraft 2*
Type:	SK76	Falcon 900
Operator:	Civ Comm	Civ Comm
Alt/FL:	2400ft QNH (1022hPa)	NK NK
Conditions:	VMC	NK
Visibility:	10nm	NK
Reported Separation:	300ft V/0m H	NK
Recorded Separation:	600ft V/0.3nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SK76 PILOT reports conducting a passenger flight. The burgundy coloured aircraft had navigation, anti-collision, strobe and search lights selected on, as was the SSR transponder with Modes A, C and S. The aircraft was fitted with TCAS I. The pilot was operating under SVFR in VMC, in receipt of a Radar Control Service from Heathrow. On departure, on a NOTAM'd flight, he was issued with clearance to route via Brent reservoir not above 1500ft and thereafter northwest towards Bovingdon. Approaching the London CTR boundary he received a 'TCAS alert' on traffic in the 12 o'clock at 2nm at the same altitude [Traffic (A)]. He requested a climb to avoid the traffic but was restricted due to departing Northolt Traffic. He maintained 1500ft until the CTR boundary and, with TCAS indicating traffic in the 12 o'clock at less than a mile, climbed to 2400ft to avoid the as yet unsighted traffic. Simultaneously, he received a 'TCAS alert' on traffic in the 9 o'clock at 1nm, climbing through his level. This traffic was sighted at a range of about 0.5nm, a low-wing, twin-engine business jet, an emergency descent was initiated, but he was unable to execute this before the traffic passed overhead with an estimated 300ft vertical separation.

He assessed the risk of collision as 'High'.

THE FALCON 900 PILOT reports departing Northolt for an overseas destination. The white and red aircraft had strobe, navigation and landing lights selected on, as was the SSR transponder with Modes A, C and S. The aircraft was fitted with TCAS II. The pilot was operating under IFR in VMC but, due to being notified of the Airprox some 3 weeks after the event, could not recall the service he was under or the agency with which he was in communication. During climb out he received an ATC instruction to level off at a lower altitude than initially cleared, due to other traffic. As no TCAS TA or RA was generated, he recalled following the ATC instruction. He had 'ACAS contact' with the traffic and was able to establish visual contact; a large helicopter which was at a lower altitude. He was surprised to receive the instruction to level-off at a lower level than initially cleared to because this reduced the separation to the other traffic. Subsequently, he thought that ATC might have had a concern with other traffic above him which would justify the level-off in this situation. He reported the visual contact and was handed over to the next frequency.

He assessed the risk of collision as 'None'.

THE NORTHOLT TOWER CONTROLLER reports he obtained departure approval and release for the Falcon 900 from Northolt Radar and Terminal Control respectively. He gave the Falcon 900 pilot clearance to take off. About 30sec later, as the aircraft was taking off, Northolt Radar called, asking 'is he lined up and ready to go', to which the Tower controller replied that the Falcon 900 was already rolling. Radar pointed out helicopter traffic [the SK76] crossing the climb-out lane, and instructed Tower to issue an early left turn to the Falcon 900 pilot. The Tower controller relayed to the Falcon 900 pilot to initiate an early left turn as instructed and, using the Distance From Touchdown Equipment[1] (DFDE) and his previous radar controlling experience, began providing Traffic Information. He believed he had sufficient time and space to allow the Falcon 900 to out-climb the SK76 and asked the Falcon 900 pilot to expedite climb. The Tower controller then observed that the helicopter was climbing and appeared to be matching, and then out-climbing, the Falcon 900. He told the Falcon 900 pilot to stop his climb as he did not know what the helicopter pilot was doing and felt that a stop-climb was the best course of action. Seeing on DFDE that there was still a definite confliction, he passed 3 further Traffic Information calls until the Falcon 900 pilot became visual. The Falcon 900 passed overhead the helicopter. Once the Tower controller felt that the aircraft were safely deconflicted, he passed the Falcon 900 pilot to the Radar frequency.

The Tower controller stated that, with very little time to react from take-off to projected point of confliction, he deemed that transferring the Falcon 900 pilot off his frequency would not discharge his duty of care. Furthermore, he did not have sufficient time or a direct line to call the relevant agency to effect suitable coordination. Therefore, he deemed the best course of action was to provide sufficient Traffic Information to the Falcon 900 pilot in order to allow him to gain visual with the helicopter. This was achieved and the Falcon 900 pilot was subsequently transferred en-route.

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

THE NORTHOLT APPROACH CONTROLLER reports he was working during a low-intensity period. Heathrow SVFR advised him that the SK76 was routeing towards Brent to vacate the London CTR. He advised that he had no traffic to affect and that he would 'retain the airspace' but that they could control the aircraft. He saw the SK76 get airborne and highlighted it on his radar. Several minutes later, Northolt Tower requested departure approval for a Falcon 900, departing on a DET4X SID, the Approach controller reported[2]. He approved the request, believing the SK76 would have time to vacate the CTR ahead of the Falcon 900. After about 1min he reassessed the situation and, realising this would not be the case, called Tower intending to cancel the departure approval. Tower informed him that the aircraft was rolling, so he pointed out the SK76 traffic to Tower and requested that the Falcon 900 pilot be issued with an instruction to make an early left turn to avoid. Heathrow SVFR called to request that the SK76 climb to altitude 2400ft, which he refused and asked them to maintain 1500ft as previously agreed. The SK76 then climbed to 2400ft whilst still inside the CTR, which conflicted directly with the Falcon 900 climbing to 3000ft, as per the SID. At no point were either aircraft on the Radar controller's frequency. He estimated CPA as ½ mile at similar altitudes.

The Radar controller stated that, after the incident, Tower informed him that he had instructed the Falcon 900 pilot to stop his climb against the SK76, believing the helicopter was out-climbing the departing Falcon 900. Heathrow SVFR informed the Radar controller that the SK76 pilot was advised not to climb because of the departing traffic, but climbed of his own accord.

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

THE NORTHOLT RADAR SUPERVISOR reports acting as ATCO I/C on duty. He was on lunch break at the time of the incident and did not witness the occurrence.

[1] An un-calibrated repeat of the radar display.
[2] Actually the CLACTON 5X SID, which was replaced by the DETLING 4X SID on 18th September 2014 (a week after the Airprox). The SIDs are identical up to and including the location of the Airprox.

Factual Background

The weather at Northolt was recorded as follows:

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METAR EGWU 111150Z 06007KT 9999 FEW030 OVC038 18/09 Q1022 BLU NOSIG
METAR EGWU 111250Z 05005KT 9999 FEW030 BKN035 18/09 Q1022 BLU NOSIG
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Analysis and Investigation

CPA between the SK76 and Traffic (A) occurred at 12:12:32, when they closed to a range of 1.9nm, and continued until 12:12:44, when the range started to increase again. In subsequent conversation it was established that the pilot of Traffic (A) was flying in the RW08 right-hand visual circuit at Elstree.

The actual Airprox CPA occurred at 12:12:48 with the Falcon 900 at 2900ft altitude. The Falcon 900 pilot descended to, and maintained, 2700ft altitude from just after CPA until 12:13:24, when he resumed the SID.

Transcripts of the Heathrow SVFR frequency and Northolt Tower frequency are reproduced below in order to assist in understanding what instructions were passed to who, and in what sequence:

Heathrow SVFR Frequency

From	To	Speech Transcription
SK76	SVFR	Heathrow [SK76 C/S] is er just starting at [departure point], be ready in two
SVFR	SK76	[SK76 C/S] (1204:40) Heathrow roger and er not above altitude one thousand feet, routeing due north from [departure point] initially, and that's special V F R
SK76	SVFR	Not above er one thousand feet, due north, special V F R, [SK76 C/S]'s starting
SK76	SVFR	[SK76 C/S]'s airborne passing five hundred feet, one zero two two
SVFR	SK76	[SK76 C/S] roger squawk ident
SK76	SVFR	Ident and er I think it's one zero two three isn't it [abbreviated SK76 C/S]
SVFR	SK76	Negative one zero two (1208:40) two now
SK76	SVFR	Two two [abbreviated SK76 C/S]
SVFR	SK76	[SK76 C/S] cleared to leave the London control zone er following Brent and then northwest bound
SK76	SVFR	(1209:00) cleared to leave the London control zone Brent and northwest bound thanks [SK76 C/S]
SVFR	SK76	(1209:40) [SK76 C/S] cleared not above altitude one thousand five hundred feet now
SK76	SVFR	(1210:00) re-cleared not above altitude one thousand five hundred feet [SK76 C/S]
SK76	SVFR	(1211:00) [SK76 C/S] request further climb, r- request altitude two thousand five hundred feet due TCAS traffic twelve o'clock
SVFR	SK76	Standby, I just need to talk to Northolt, there is traffic observed in your twelve o'clock, right to left, westbound, indicating one thousand two hundred feet, range of two and a half miles
SK76	SVFR	(1211:20) roger [abbreviated SK76 C/S]
SVFR	SK76	[SK76 C/S] there is traffic leaving er the er Northolt zone so just er wait until (1211:40) you're outside controlled airspace, it's southwest of you by four miles at seven hundred feet, climbing out
SK76	SVFR	Roger that's copied but er what about the traffic twelve o'clock, two hundred below [abbreviated SK76 C/S]
SVFR	SK76	That's outside controlled airspace this one's inside
SK76	SVFR	Roger we're just crossing the boundary now in the climb to altitude two thousand four hundred feet [abbreviated SK76 C/S]
SVFR	SK76	Thank you, that traffic (1212:00) previously mentioned from Northolt is southwest of you now by two miles, turning northbound, one thousand six hundred feet
SK76	SVFR	Roger and has he been deconflicted from us [abbreviated SK76 C/S]
SVFR	SK76	He's climbing above you but if you climb now you may cause a TCAS

From	To	Speech Transcription
SK76	SVFR	Roger (1212:20) and [abbreviated SK76 C/S]'s visual with the traffic
SVFR	SK76	Thank you, you're outside now Traffic Service
SK76	SVFR	Traffic service [abbreviated SK76 C/S] yea-
SK76	SVFR	(1212:40) Heathrow [SK76 C/S] er be advised we're going to have to file on that one
SVFR	SK76	Roger
SVFR	SK76	And just confirm [abbreviated SK76 C/S] you're going to be filing on the traffic out of Northolt (1213:00)
SK76	SVFR	Affirm [abbreviated SK76 C/S]
SVFR	SK76	Okay

Northolt Tower frequency

From	To	Speech Transcription	Time
Tower	Approach	Err Tower can you call back with departure approval when you're happy for [Falcon C/S]	12:06:28
Approach	Tower	Erm, on a Clacton five x-ray	12:06.43
Tower	Approach	Affirm	12:06.45
Approach	Tower	Go Ahead with the details	12:06.48
Tower	Approach	Three four zero seven	12:06.50
Approach	Tower	Three four zero seven	12:06.51
Tower	Approach	One one eight decimal eight two five	12:06.52
Approach	Tower	One one eight decimal eight two five, roger, I'll call you back	12:06.53
Tower	Approach	Roger	12:06.53
Approach	Tower	Northolt	12:06.54
Tower	Approach	Tower	12:06.54
CCF NW	ATC Asst	[Falcon C/S] on a Clacton is released	12:08.15
ATC Asst	CCF NW	He's released	12:08.17
Tower	Falcon	[Falcon C/S], runway zero seven, line up, surface wind zero nine zero, four knots	12:08.37
Falcon	Tower	Line up zero seven, [Falcon C/S]	12:08.41
CCF NE	Tower	North East Radar	12:09.58
Tower	CCF NE	Hello, it's Northolt Tower, erm, we've got a release from you from [Falcon 90 C/S], the [other traffic] is not clearing our area as quick as we thought, are you happy for me to extend for about another thirty seconds or so?	12:09.59
CCF NE	Tower	That is fine yeah	12:10.11
Tower	CCF NE	Thank you very much	12:10.12
Tower	Approach	Tower	12:10.28
Approach	Tower	Approach, [Falcon C/S] is Clacton five x-ray departure approved	12:10.29
Tower	Approach	Departure approved thank you, Tower	12:10.30
Tower	Falcon	[Falcon C/S], Runway zero seven, cleared for take-off, surface wind zero five zero, zero four knots	12:10.38
Falcon	Tower	Cleared for take-off zero seven, [Falcon C/S]	12:10:43
No transmissions relevant to the Airprox			
Tower	Approach	Tower	12:11.13
Approach	Tower	Approach, is he lined up ready to go is he?	12:11.14
Tower	Approach	He's going	12:11.16
Approach	Tower	Oh is he?	12:11.17
Tower	Approach	Yea	12:11.17
Approach	Tower	[Redacted], I've just seen [the SK76] coming across at five miles.	12:11.17

From	To	Speech Transcription	Time
Tower	Approach	Yea, let me just clock that [2sec pause] Erm	12:11.19
Approach	Tower	If you could just ask him to make an early left turn please?	12:11.23
Tower	Approach	Wilco	12:11.24
Approach	Tower	Thank you, appreciate that.	12:11.25
Tower	Falcon	[Falcon C/S], are you able to initiate an early left turn? Traffic northeast, four miles, tracking northwest, indicating four hundred feet above	12:11.38
Falcon	Tower	Looking out, [Falcon C/S]	12:11.47
Tower	Falcon	[Falcon C/S], the traffic northeast three miles, tracking northwest, one hundred feet below	12:12.00
Falcon	Tower	Looking out, [Falcon C/S]	12:12.07
Tower	Falcon	[Falcon C/S], the traffic … are you able to expedite climb?	12:12.14
Falcon	Tower	Expedite Climb, [Falcon C/S]	12:12.17
Tower	Falcon	[Falcon C/S], traffic right one o'clock, two miles, crossing right left, same height	12:12.20
Tower	Falcon	[Falcon C/S] STOP your climb please	12:12.26
Falcon	Tower	Stop climb, [Falcon C/S]	12:12.28
Tower	Approach	Tower, I'm giving him Traffic Information	12:12.30
Approach	Tower	Roger, thank you, Approach	12:12.32
Tower	Falcon	[Falcon C/S], traffic <Stepped on>	12:12.37
Tower	Falcon	Confirm visual?	12:12.38
Falcon	Tower	Affirm visual, it's a Helicopter, [abbreviated Falcon C/S]	12:12.39
Tower	Falcon	[Falcon C/S] roger, continue with Northolt Departures, one two nine decimal one two five, many thanks for your help	12:12.43
Falcon	Tower	One two nine decimal one two five, [Falcon C/S], Good day.	12:12.47

CAA ATSI

ATSI had access to reports from both pilots, the SVFR controller, area radar recordings, transcription of the SVFR frequency and a copy of the LTC unit report. The SK76 pilot was operating under SVFR on a flight from a private site in Central London and was in receipt of a Radar Control Service from LTC Heathrow SVFR. OJTI was in progress on the SVFR sector. The Falcon pilot was on an IFR flight from Northolt to an airfield abroad and was in receipt of an Aerodrome Control Service from Northolt Tower.

At 1204:34, the SK76 pilot contacted the SVFR controller reporting that they were starting and ready for departure in two minutes. The SVFR controller issued a clearance to the SK76 not above 1000ft SVFR then VFR routeing, due north initially.

At 1204:55, the SVFR controller contacted Northolt to co-ordinate the SK76 via Brent Reservoir. The Northolt controller made reference to traffic going into the overhead at 2400ft but stated that Northolt traffic would remain 3nm from the SK76. The SVFR controller stated that the SK76 would be not above 1500ft via Brent and the Northolt controller acknowledged this.

At 1208:28, the SK76 pilot contacted SVFR, passing 500ft, and was instructed to route via Brent then northwest bound and was re-cleared not above 1500ft. At 1211:06, the SK76 pilot requested a climb to 2500ft due to TCAS traffic in the pilot's 12 o'clock (squawking 7000 in Figure 1 – Traffic (A)). The SVFR controller instructed the SK76 pilot to standby while he talked to Northolt and advised the SK76 pilot of "*traffic observed in your twelve o'clock right to left westbound indicating one thousand two hundred feet range of two and a half miles"* (Figure 1).

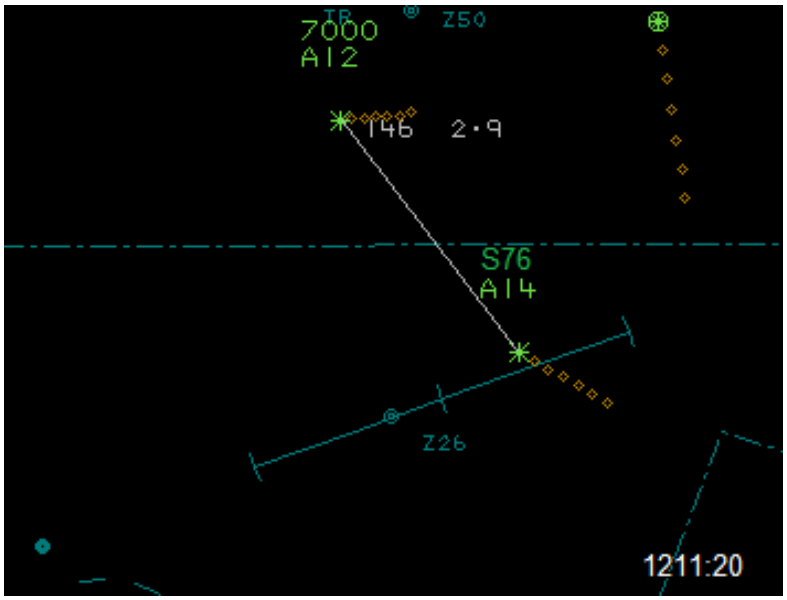

Figure 1

The SVFR controller initiated a phone call to Northolt requesting climb to 2400ft for the SK76. The Northolt controller replied that he had one getting airborne on an early left turn and to wait until the SK76 was outside controlled airspace.

The SVFR controller informed the SK76 pilot that there was traffic leaving the Northolt zone and instructed him to wait until he was outside controlled airspace to climb. The SVFR controller informed the SK76 pilot that the traffic was southwest of him by 4nm at 700ft climbing (Figure 2). The SK76 pilot replied that the traffic was copied and asked "*but er what about the traffic twelve o'clock two hundred below".* The controller replied that the traffic was outside controlled airspace and the traffic he had called was inside.

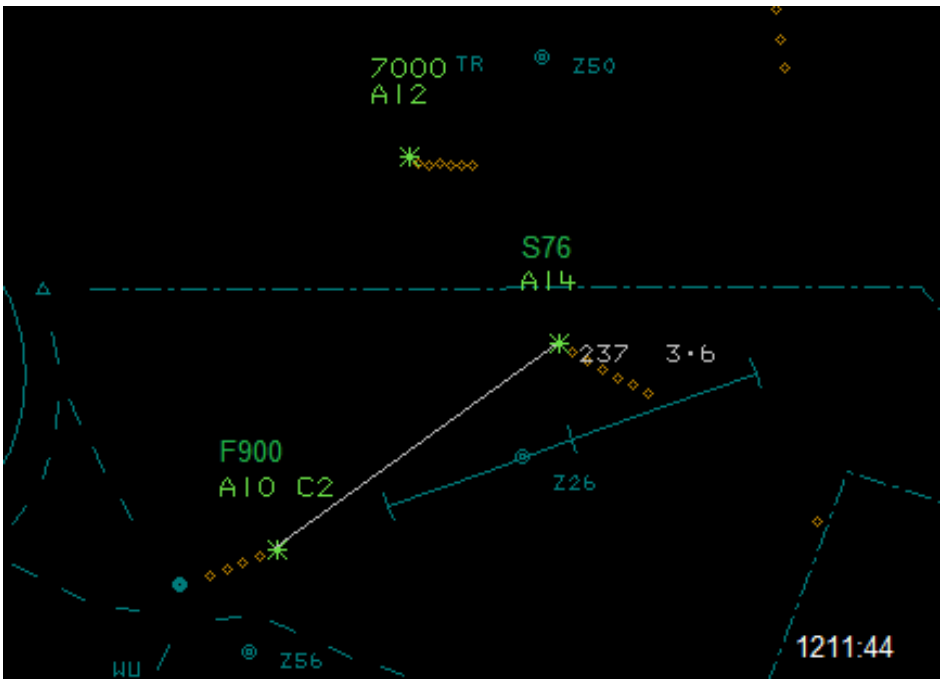

Figure 2

At 1211:55, the SK76 pilot reported that they were just crossing the [London CTR] boundary in the climb to 2400ft (Figure 3). The SVFR controller replied that the previously mentioned traffic from Northolt was southwest by 2nm at 1600ft, turning northbound. Separation was lost at 1211:58 when the SK76 was indicating 1500ft and the Falcon pilot was climbing through 1400ft, 2.8nm apart and inside the Class A airspace of the London CTR.

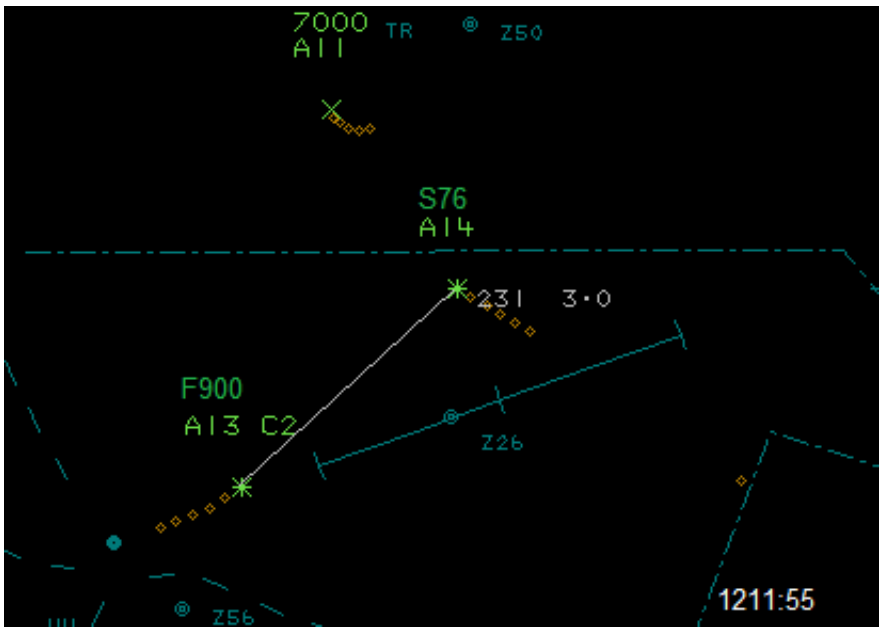

Figure 3

The SK76 pilot asked if the Falcon had been "*deconflicted from us*" and was informed by the SVFR controller that the Falcon pilot was climbing above but if the SK76 climbed it may cause a TCAS alert. The SK76 pilot acknowledged the transmission and stated that they were visual with the traffic. The SVFR controller changed the service to a Traffic Service. CPA inside controlled airspace, co-altitude at 1.9nm horizontal separation, occurred at 1212:13 (Figure 4).

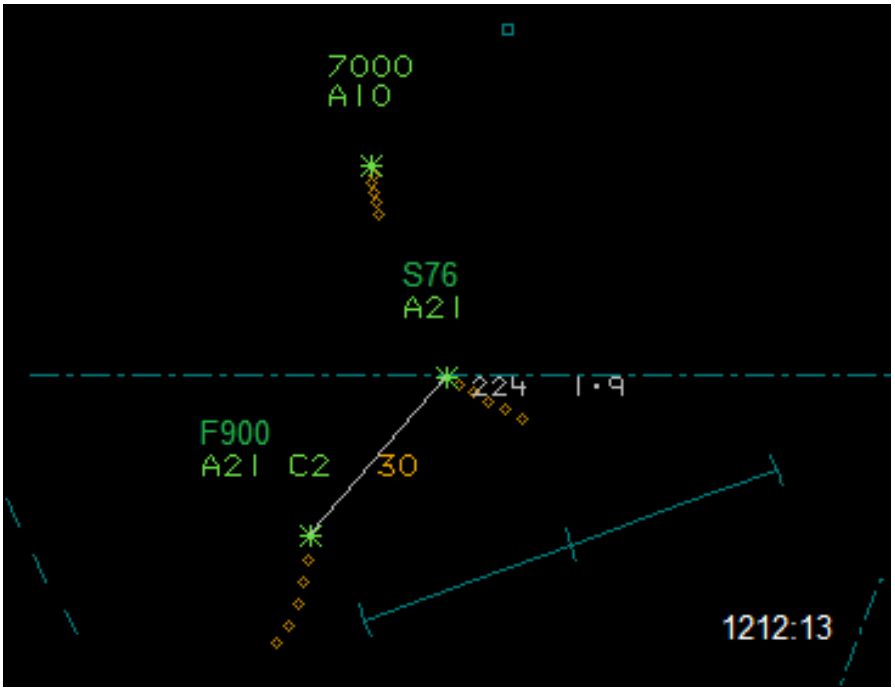

Figure 4

CPA outside controlled airspace, 600ft vertical and 0.3nm horizontal separation, occurred at 1212:49 (Figure 5).

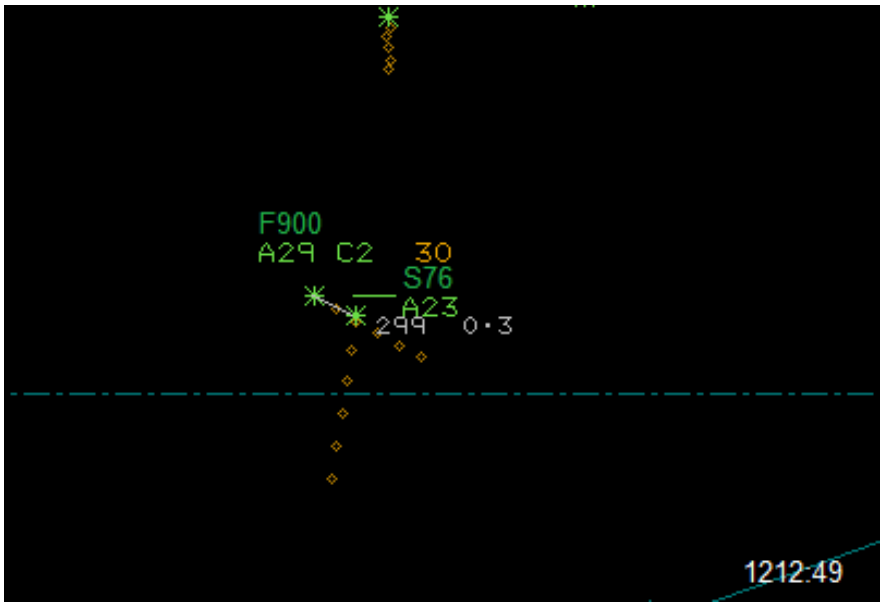

Figure 5

Having approved the transit of the SK76 not above 1500ft, the Northolt Radar controller released the Falcon pilot for departure. When the controller identified the possible confliction with the SK76 on radar he telephoned Northolt Tower to try to withdraw the departure clearance. The Tower controller advised that the Falcon pilot was already departing and the Northolt Radar controller requested that the Falcon pilot be given an early left turn.

The SK76 had been co-ordinated with Northolt and the Northolt controller stated that they would remain 3nm away from the SK76. When the Northolt Radar controller realised that the departing Falcon pilot would be in conflict with the SK76 he attempted to stop the departure, however, the Falcon pilot had already taken off. The subsequent early left turn issued to the Falcon pilot could have exacerbated the confliction with the SK76 but the radar replay does not show the Falcon pilot turning significantly early.

The Northolt Radar controller did not ensure that separation would be maintained between the Falcon and the SK76 prior to the departure of the Falcon. The SK76 pilot climbed inside controlled airspace without a clearance due to concern regarding other traffic outside controlled airspace, which resulted in further reducing the separation. Minimum distance inside controlled airspace was 1.9nm/0ft (3nm/1000ft required).

Military ATM

The incident occurred on 11 Sep 14 at 1213 between a SK76 and a Falcon 900. The Falcon was being controlled by Northolt Tower, following a departure from RAF Northolt and the SK76 was under a Radar Control Service with SVFR at Heathrow Radar.

At 1208:15, the Northolt ATC assistant received a release from CCF NW (TC) on the Falcon departure. Heathrow Radar transmitted to the SK76 at approximately 1209:06, "[SK76 C/S], *clear to leave the London Control Zone following Brent and then north-west bound.*" Heathrow radar confirmed, "[SK76 callsign] *cleared not above 1500 feet now.*" The SK76 pilot had already been passed the QNH of 1022hPa.

At 1208:37, the Falcon had been lined-up by the Northolt Tower controller and at 1209:59, the Tower controller called CCF NE (TC) to request, "*Hello, its Northolt Tower, erm, we've got a release from you from* [Falcon C/S] *the* [other traffic] *is not clearing our area as quick as we thought, are you happy for me to extend for about another thirty seconds or so?*" CCF NE confirmed that the delay was acceptable.

At 1210:29 (Figure 2), Approach called Tower to approve the release on the Falcon, "*Approach*, [Falcon C/S] *is Clacton Five-Xray, departure approved*."

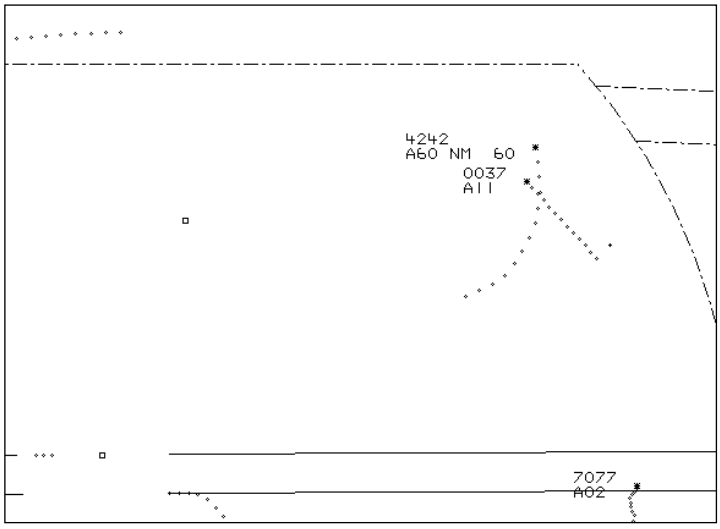

Figure 2: Falcon released by Approach at 1210:29, SK76 squawking 0037

The Falcon pilot was cleared for take-off by Northolt Tower at 1210:43 and, at approximately 1211:07, the SK76 pilot requested, "[SK76 C/S] *request further climb, request altitude 2500 feet due to TCAS traffic 12 o'clock*". Heathrow Radar responded with, "*Standby, I just need to talk to Northolt. There is traffic observed in your 12 o'clock, right to left westbound, indicating 1200 feet, range 2 and a half miles.*" At 1211:14, Approach called Tower to enquire, "*Approach, is he lined up ready to go is he?*" Tower replied at 1211:16 with, "*He is going.*" Approach instructed at 1211:23 (Figure 3), "*If you could ask him to make an early left turn please?*"

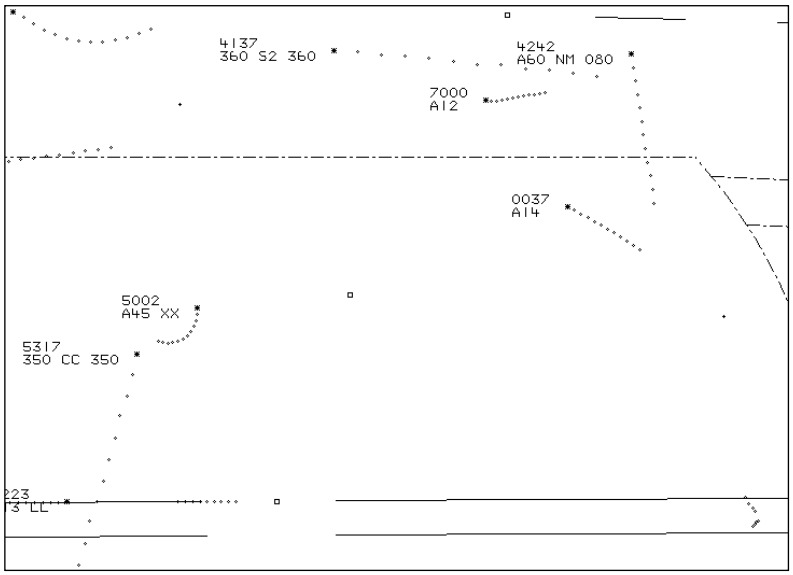

Figure 3: At 1211:23 as Approach requested an early left turn on the Falcon

At 1211:38 (Figure 4), Tower requested, "[Falcon C/S] *are you able to initiate an early left turn? Traffic northeast four miles tracking northwest, indicating four feet above.*" The Falcon pilot replied with, "*looking out*". At approximately 1211:35, Heathrow Radar called Northolt Approach to request, "*Can I go to two point four with the* [SK76 C/S] *now?*" Northolt Approach replied with, "*I've just got one lifting now, making an early left turn, if you can wait.*" Heathrow Radar replied with, "*Yeah, will do.*" At approximately 1211:41, Heathrow Radar transmitted, "[SK76 C/S] *there is traffic leaving the Northolt zone, so just wait until you're outside CAS, its south-west of you by 4 miles at 700 feet climbing out.*" The controller and SK76 pilot entered into dialogue about the respective sets of traffic.

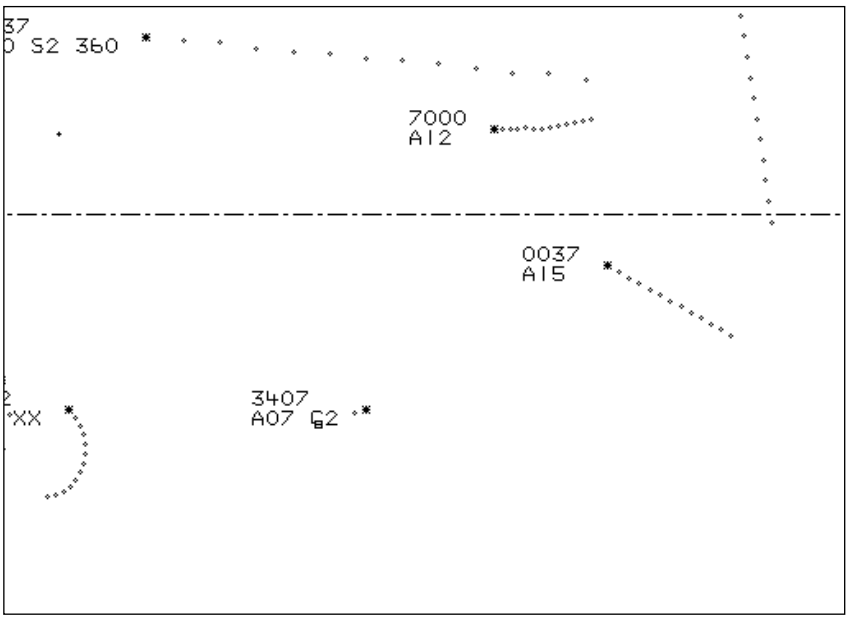

Figure 4: At 1211:38 with Traffic Information and early left turn request (Falcon squawk 3407)

At 1212:00 (Figure 5), Tower updated information, "[Falcon C/S] *the traffic northeast three miles, tracking northwest, one hundred feet below.*" The Falcon pilot again responded with, "*looking out*".

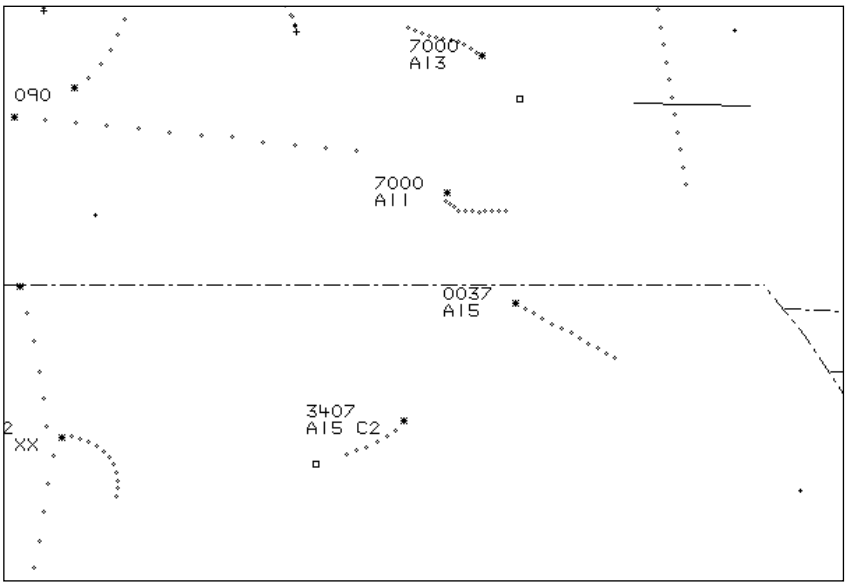

Figure 5: Traffic Information at 1212:00

At 1212:14, Tower requested, "[Falcon C/S] *the traffic…are you able to expedite climb?*" Tower added at 1212:20 (Figure 6), "[Falcon C/S] *traffic right one o'clock two miles, crossing right left, same height.*" At this point, the SK76 was crossing the CTR boundary and Mode C indicated 2300ft on QNH 1022 hPa.

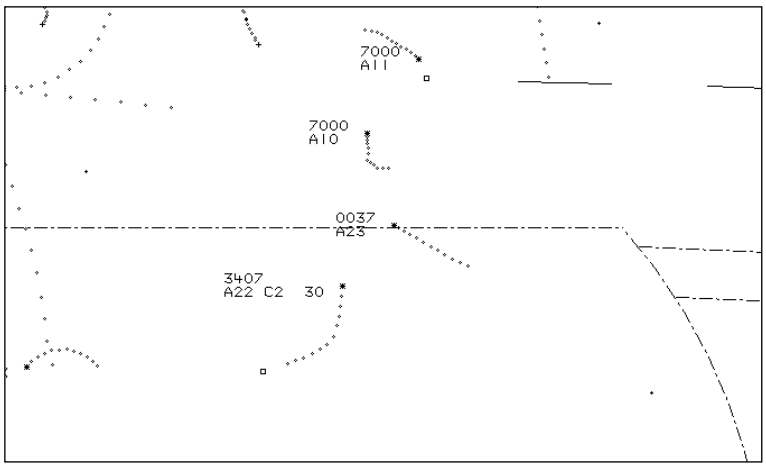

Figure 6: Traffic Information at 1212:20

At 1212:26, Tower requested, "[Falcon C/S] *stop your climb please.*" Approach called Tower at 1212:32 and Tower confirmed that Traffic Information was being passed. At 1212:37 (Figure 7), Tower requested, "[Falcon C/S] *traffic* [stepped on] *confirm visual?*" The Falcon pilot replied immediately at 1212:39 with, "*Affirm visual, it's a helicopter.*"

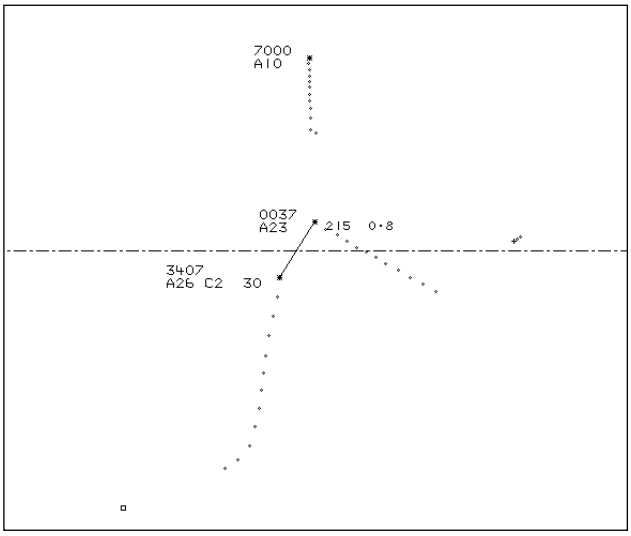

Figure 7: At 1212:37 as Tower requested if the Falcon pilot was visual

The CPA was approximately between 1212:44 and 1212:48 with 0.3nm horizontal separation and 600ft vertical separation (Figure 8).

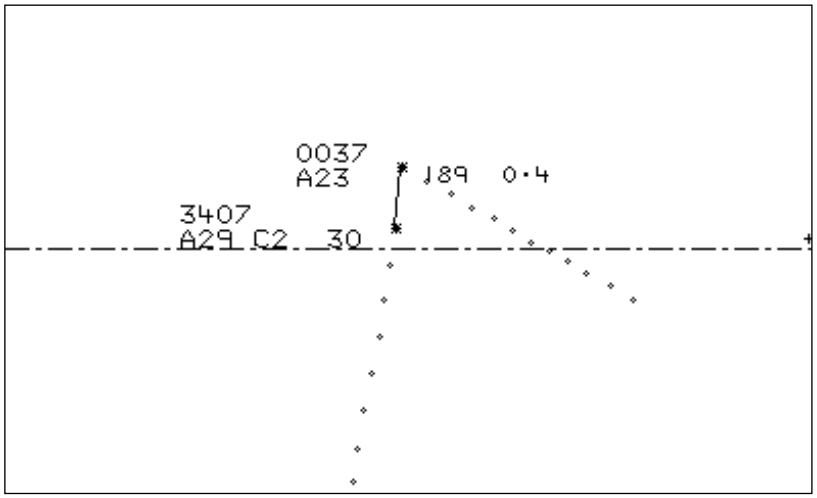

Figure 8: Approximate CPA at 1212:44

The Northolt Radar Manoeuvring Area (NRMA), from surface to 2000 ft, is a section of the London TMA shared with Heathrow Radar (SVFR) where control can be verbally switched between agencies. One party can clear aircraft under its control through the airspace when it is not in control, with the agreement of the controlling party. Northolt regularly allow Heathrow to control aircraft on the heli-lanes, without need to transfer to Northolt Radar, if there is nothing to affect.

A regular routing for aircraft vacating central London is via the Brent reservoir to follow the BNN 143 radial to vacate the CTR. Release of a Northolt departure would be subject to a Battersea-Brent aircraft taking up the northerly track from the Brent Reservoir, rather than taking up the BNN 133 radial, to ensure 3nms separation between SVFR and IFR. It is routine at Northolt to have departures against CTR transits; the standard transit instruction would be for a northerly track from Brent (and not a NW track to the BNN 133 radial) to maintain greater separation against departing aircraft. On this occasion, Northolt Approach was under the impression that the SK76 would route via Alexander Palace; irrespective of the routing point. Northolt had instructed Heathrow to keep the SK76 but remained responsible for separation against Northolt departures. At the incident time, the CTR was Class A airspace and procedures have since changed.

From the transcript, Northolt Approach had been monitoring a Heathrow frequency to establish the climb of a Northolt departure; once the departure had passed 4000ft, the Falcon (on a SID initially to 3000ft) could be released. The controller mentioned that the release approval had probably come through sooner than expected and the Falcon release request from Tower was granted. The Northolt Approach controller was bandboxing Approach and Director with no aircraft on frequency. At the time of the decision to release the Falcon, the controller may have been distracted by the climbing Northolt departure, possibly compounded by the judgement that the SK76 would be clear of the airspace. This distraction and pressure to release the Falcon meant that the Approach controller did not tactically monitor the SK76 that was being worked by another agency. A reminder that the airspace had been ceded to SVFR may have altered the release on the Falcon.

The Northolt Tower controller acted upon the release and cleared the Falcon for departure. Upon being made aware of the confliction from Approach, Tower took responsibility to pass control instructions and provide as much Traffic Information as possible, to help the Falcon pilot get visual with the SK76. The plan to expedite the Falcon climb, to gain vertical separation, had changed when the SK76 began to climb and the Tower controller reacted by providing a 'stop climb', with more Traffic Information. When it was known that standard separation may not have been maintained in controlled airspace, the Tower controller made good use of the radar feed to demonstrate duty of care to an aircraft on frequency. Tower was instructed to issue an early left-hand turn and, having done this, the controller decided to resolve the confliction and not advise a frequency change with the confliction looming. The left turn was given at 1211:38 and the Falcon called visual at 1212:39.

The radar reply indicated that the SK76 pilot climbed whilst inside the CTR; Figure 6 shows the SK76 crossing the CTR boundary with a Mode C altitude of 2300ft on the radar replay pressure of 1022hPa. The SK76 pilot had NOTAM'd the flight and could rightly assume that all parties were aware of his presence. The pilot was aware of the separation standards in controlled airspace and was looking ahead to Class G to see what was outside the CTR in the unknown traffic environment. The pilot mentioned the first confliction at 12 o'clock, 2nm, same altitude, and this decreased to half a mile, co-altitude. It is evident that the SK76 pilot was keen to climb above the confliction on TCAS and when the Falcon first appeared on TCAS at 1 nm, an emergency descent was planned. The Falcon was then seen at half a mile and the avoiding action descent was not acted upon as the Falcon passed overhead. During the two TCAS alarms, the crew would have spent some time responding to search, identify and then form a plan to evade on two separate tracks.

The barriers to an Airprox in controlled airspace would normally be the standard separation limits applied by controllers and the airspace classification, along with ACAS/TAS and 'see and avoid'.

Standard separation was not maintained but TCAS and Traffic Information combined to help avert the risk of collision. The Falcon pilot called visual at 1212:39, at approximately 0.8nm horizontal separation and 300ft vertical separation. The radar replay showed the SK76 climb prior to the CTR boundary but that was in the context of avoiding unknown traffic outside. Routinely, the crews would not have to use 'see and avoid' in the CTR but a potentially distracted controller did not perceive the confliction prior to releasing the Falcon. The Northolt Approach controller admitted, with the benefit of hindsight, that he would have held the Falcon on the ground or taken control of all aircraft to deconflict. Following a local investigation, the unit recommendations changed the procedure so that Northolt Radar would take control of all transits when an aircraft was on start or aircraft were warned inbound (runway dependent). The training package was updated to reflect the change in procedure. In addition, there is a planned addition to the MATS Part 2, to make all parties aware of the procedure. Post incident, the airspace changes and actions taken by Northolt Radar will highlight the incident to controllers and amend the procedure to provide a more systematic approach to reducing the likelihood of a re-occurrence.

UKAB Secretariat

The SK76 and Falcon 900 pilots shared an equal responsibility for collision avoidance and not to fly into such proximity as to create a danger of collision[3]. Deconfliction minima within the Class A London CTR were 3nm horizontally or 1000ft vertically.

Summary

An Airprox was reported when an SK76 and a Falcon 900 flew into proximity at 1213 on Thursday 11th September 2014. Both pilots were operating in VMC, the SK76 pilot under VFR in receipt of a Traffic Service from Heathrow SVFR, and the Falcon 900 pilot under IFR and effectively in receipt of a Radar Control Service from Northolt Tower.

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 considered the controllers' actions. The Northolt Approach controller had agreed departure of the SK76 with Heathrow SVFR and that he would maintain separation on Northolt traffic against SVFR traffic. At that time he had one aircraft climbing into the overhead but no other traffic. The Board opined that his subsequent clearance for the Falcon 900 pilot to depart Northolt appeared to be based on a mis-perception of the SK76 pilot's rate of progress towards the edge of the London CTR. Members agreed that his release of the Falcon into conflict with the SK76 had been one of the key contributory factors to the Airprox. Notwithstanding, the Board noted that the mis-perception had been recognised just over a minute later when the Approach controller rang Northolt Tower controller to enquire as to the status of the Falcon 900, which was then just taking off.

Members agreed that from this point onwards it was highly probable that separation would likely be lost (3nm/1000ft). However, given the rate of climb of a Falcon 900 (to 3000ft by the CTR boundary, and higher afterwards, on the CLN 5X SID), a collision with the SK76 (remaining below the TMA base of 2500ft) was unlikely. However, in attempting to manage the situation further, the Northolt Approach and Tower controllers' request for an early left turn by the Falcon 900 pilot was probably (fortuitously) unachievable; members agreed that he was probably busy reconfiguring the aircraft after takeoff and, with the rapid climb performance of the Falcon, was not able to turn left appreciably before he was required by the SID to do so. Members noted that in fact the normal turn position had eventually resulted in increasing the horizontal separation at CPA.

[3] Rules of the Air 2007 (as amended), Rule 8 (Avoiding aerial collisions).

The Board noted that the Tower controller had access to a radar display repeater and had used his previous radar controlling experience to attempt to gain vertical separation and pass Traffic Information to the Falcon pilot in order for him to visually acquire the SK76. Some members questioned whether the Tower controller should have applied control to the Falcon pilot but, after some discussion, agreed that his actions were laudable and commended him for his attempts at preserving separation. Unfortunately, events then conspired to turn a likely marginal loss of separation into a more serious incident. Having observed the SK76 pilot start to climb also, the Tower controller's request to the Falcon pilot to expedite climb, followed by a request to stop climb about 10sec later, resulted in no discernible change to the Falcon's vertical flight path but probably served to increase his cockpit workload and instil confusion.

Turning to the pilots' actions, the Falcon 900 pilot had been released on the SID and had conducted a normal departure from Northolt until the Tower controller's requests to turn left early, expedite climb and then, almost immediately, to stop climb. In the end, the Falcon pilot had levelled at just under 3000ft by CPA and members agreed that, although the Falcon pilot acknowledged ATC's requests, he was unlikely to have been able to act on them given the time available and his existing workload after take-off. Having levelled he was then able to gain visual contact on the SK76 before CPA due to the Tower Controller's Traffic Information calls.

For his part, the SK76 pilot had conducted a normal departure and was operating under SVFR with a clearance including routeing instructions and maximum altitude. He had become concerned by the perceived proximity of traffic operating in the Class G airspace outside the London CTR, Traffic (A), as observed on his TCAS display and reported by Heathrow SVFR. Members noted that the SK76 pilot reported separation on Traffic (A) as 'less than a mile' but that radar replay indicated it was never less than about 2nm, and had been reported as 'two and a half miles' by Heathrow SVFR when the SK76 pilot raised his concern. Nevertheless, the SK76 pilot perceived a collision risk, asked for a climb that was refused, and then elected to climb autonomously above Traffic (A) as he approached the airspace boundary.

Sensitive to the dangers of dissecting the circumstances of an Airprox incident with 20:20 hindsight in the relative comfort of a conference room, members observed that the SK76 pilot had reacted to what he perceived to be a threat whilst in a rapidly changing airborne scenario when Traffic (A) was not in fact a collision factor. Nevertheless, after much discussion, it was agreed that the SK76 pilot's decision to climb due to his perception of confliction with Traffic (A) had contributed to the Airprox. Specifically, he had climbed above 1500ft whilst within the London CTR, contrary to ATC instruction, and into conflict with the Falcon 900. Members agreed that this was the root cause of the Airprox. Members also observed that, despite the SK76 pilot's mis-perception of the proximity of Traffic (A), he was free to navigate under VFR within the CTR via the cleared routeing points, and that he could have conducted an orbit within the CTR, slowed down, or changed heading to go behind rather than continue towards Traffic (A), whilst conveying his concerns to ATC. The Board were concerned that, having been passed Traffic Information on the departing Falcon, the SK76 pilot did not appear to assimilate that it was a greater factor than Traffic (A) (which had by that time turned away to the north), as he continued his climb to near the base of the TMA. In this respect, members wondered whether the presence of a NOTAM detailing his route and timings (which served only as a warning to other traffic) indicated that the SK76 pilot appeared to have been expecting a degree of priority or protection which did not exist.

The Board then discussed the level of risk, with some members of the opinion that safety margins had been much reduced in what was a highly dynamic situation. However, after much debate, and a vote to achieve consensus, members determined in the end that the vertical separation at CPA (600ft) was such that, in terms of a likely collision risk, safety margins had not been greatly reduced below the normal. Nevertheless, they agreed also that the associated risk rating of Category C should not detract from what was a serious Airprox with a potentially drastic outcome whilst under the control of ATC agencies.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The SK76 pilot climbed into conflict with the Falcon 900, contrary to ATC instructions.

Contributory Factors: 1. The Northolt Approach controller released the Falcon 900 into conflict with the SK76.

2. The SK76 pilot climbed due to a perceived conflict with Traffic (A).

Degree of Risk: C.

ERC Score[4]: 10.

[4] Although the Event Risk Classification (ERC) trial had been formally terminated for future development at the time of the Board, for data continuity and consistency purposes, Director UKAB and the UKAB Secretariat provided a shadow assessment of ERC.