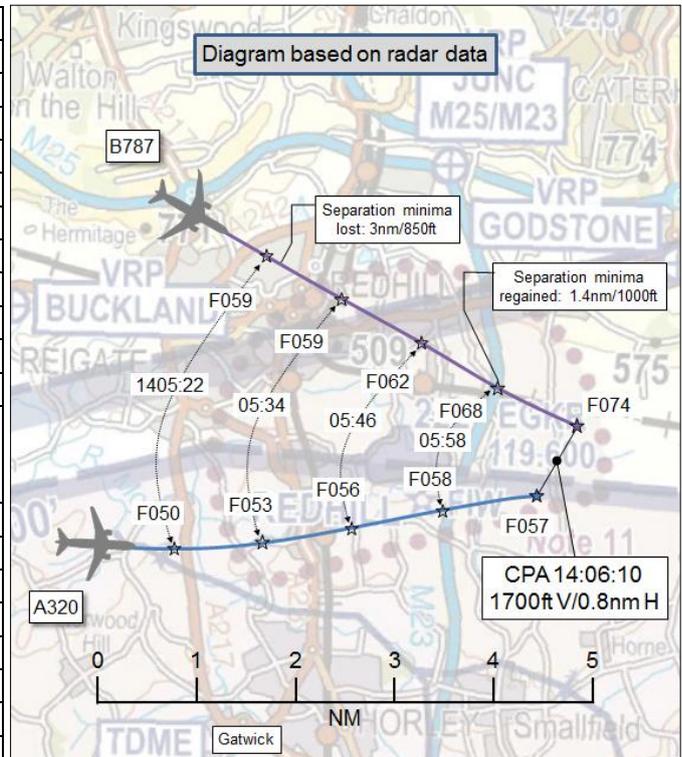


AIRPROX REPORT No 2016199

Date: 14 Sep 2016 Time: 1406Z Position: 5113N 00005W Location: 8nm ENE Gatwick airport

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	A320	B787
Operator	CAT	CAT
Airspace	London TMA	London TMA
Class	A	A
Rules	IFR	IFR
Service	Radar Control	Radar Control
Provider	Swanwick TC	Swanwick TC
Altitude/FL	5600ft	6200ft
Transponder	A,C,S	A,C,S
Reported		
Colours	Company	NK
Lighting	Landing, beacon, strobes, Logo, nav	NK
Conditions	VMC	NK
Visibility	50km	NK
Altitude/FL	5800ft	NK
Altimeter	QNH	NK
Heading	095°	NK
Speed	250kt	NK
ACAS/TAS	TCAS II	TCAS II
Alert	TA	Unknown
Separation		
Reported	600ft V/2nm H	NK
Recorded	500ft V/2.2nm H	



THE AIRBUS A320 PILOT reports that during departure from Gatwick (initial SID ADMAG 2X) London Control cleared them to climb to 6000ft on heading 095°. Passing 5800ft (vertical speed 1500fpm) on the given heading, the controller instructed them to descend to 5000ft. The First Officer queried the request as the Captain (pilot flying) initially selected 5000ft on the Flight Control Unit. As this was being selected a TCAS TA occurred. The Captain disconnected the autopilot, ordered flight directors OFF and began descent to 5000ft, at which point the controller instructed them to turn onto heading 105°. The B787 came within 600ft of them in their 11 o'clock position and then began to climb and turn left away from them. They maintained visual contact throughout the manoeuvre. Once clear the controller re-cleared them to climb to 6000ft (it appeared to both crew that this instruction was given by a different controller).

He assessed the risk of collision as 'Medium'.

THE BOEING 787 PILOT was from a foreign airline and did not file a report.

THE TC BIGGIN CONTROLLER reports that he instructed the B787 pilot, airborne from Heathrow, to fly a heading of 125° after EPSOM. He also instructed the A320 pilot, airborne from Gatwick, to climb to 6000ft. As a result, the two aircraft came into conflict at 6000ft to the north of Gatwick. When he realised that both aircraft were at the same level, he instructed the B787 pilot to climb to FL100 and the A320 pilot to stop his climb. He also gave avoiding action to the B787 pilot (heading 070°) and instructed the A320 pilot to turn onto heading 105°.

Factual Background

The weather at Gatwick was recorded as follows:

EGKK 141350Z 18006KT 130V220 CAVOK 26/15 Q1011=

The relative tracks of the Heathrow DET 2F and Gatwick ADMAG2X SIDs are shown at Figure 1.

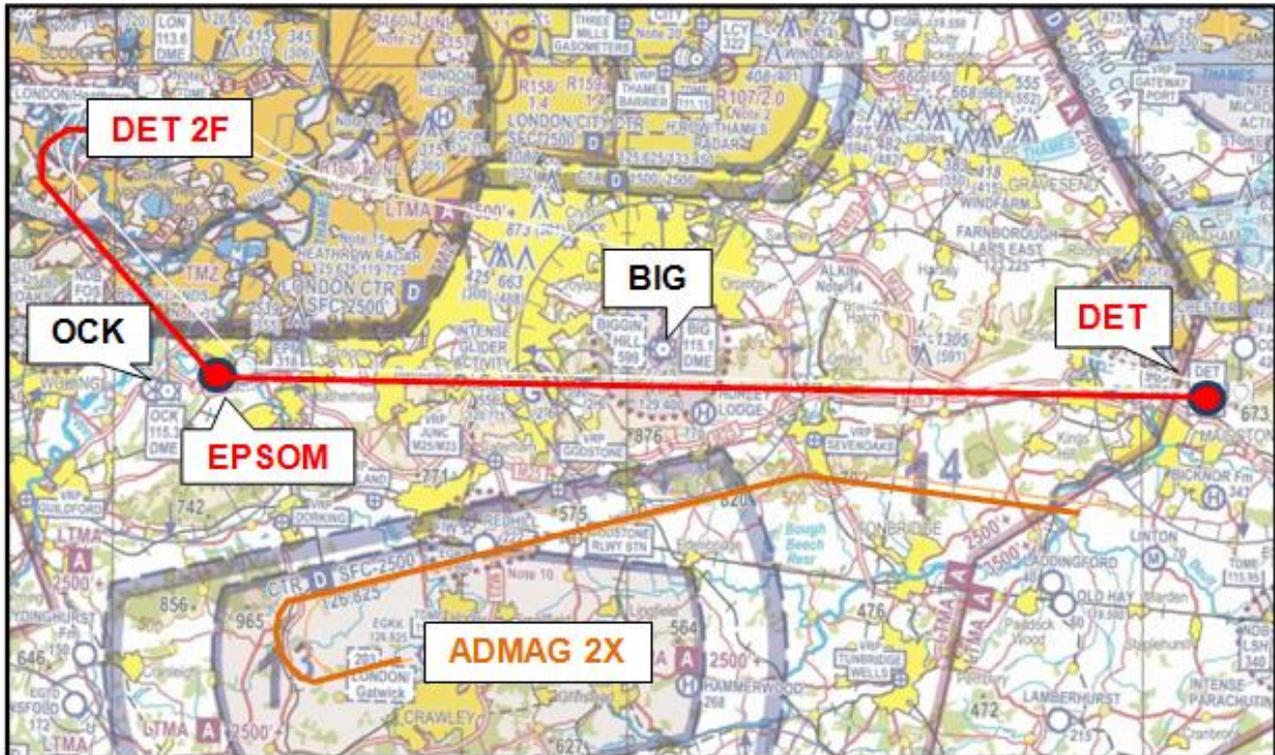


Figure 1 – DET 2F & ADMAG SIDs

Analysis and Investigation

CAA ATSI

ATSI had access to reports from the pilot of the A320, the Biggin Sector controller, the area radar recordings and a transcript of the Biggin Sector frequency. ATSI also had access to the unit investigation report. Screenshots in the report are taken from the area radar recording.

An Airprox was reported in Class A airspace between an A320 and a B787 8nm south-west of the Biggin (BIG) Hold. The A320 pilot was on an IFR flight from London Gatwick, in receipt of a Radar Control Service from the London Terminal Control Biggin Sector. The B787 pilot was on an IFR flight from London Heathrow, also in receipt of a Radar Control Service from the Biggin Sector controller.

The B787 was airborne first on a DET 2F Standard Instrument Departure (SID) from Heathrow, climbing to altitude 6000ft. At 1402:02, the Biggin Sector controller instructed the B787 pilot to leave the next waypoint, EPSOM, on a heading of 125°, which was acknowledged by the pilot.

At 1403:21, the A320 pilot reported on frequency, flying the ADMAG 2X SID from Gatwick, climbing to 4000ft which was acknowledged by the controller.

At 1403:40, the B787 pilot reported on heading and level at 6000ft, which was acknowledged by the controller.

At 1404:21, the controller instructed the A320 pilot to climb to 6000ft (Figure 2).

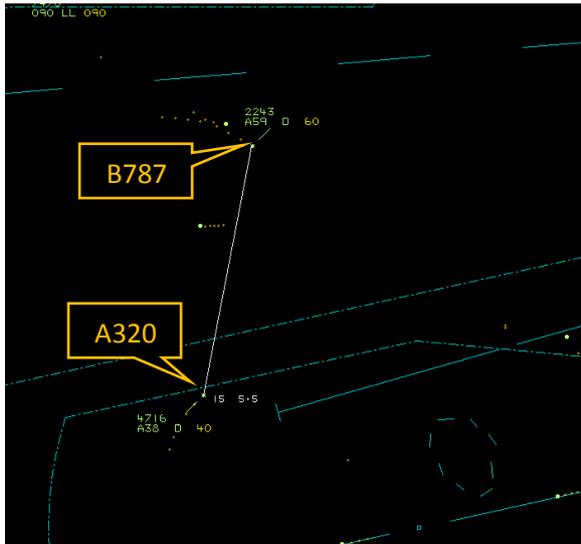


Figure 2 - Swanwick MRT – 1404:21

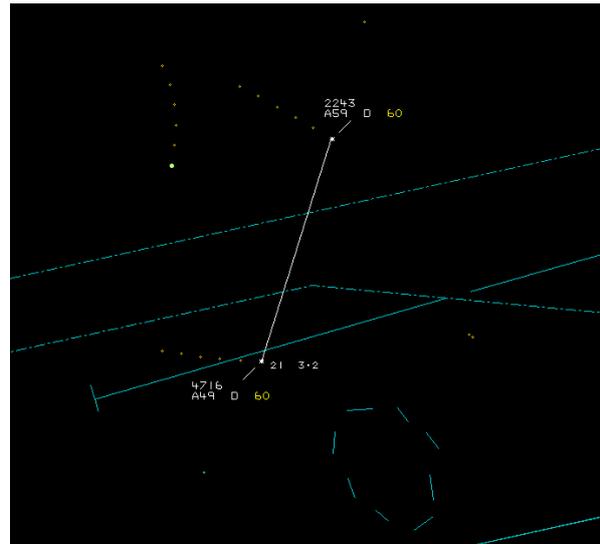


Figure 3 - Swanwick MRT – 1405:21.

The frequency was busy with almost continuous transmissions from other aircraft until at 1405:12, the B787 pilot was instructed to climb to FL100. However, this call was blocked by the transmission from another pilot and so had to be repeated. At 1405:21 a white Short Term Conflict Alert (STCA) was activated on the controller's radar display (Figure 3).

At 1405:23 the controller instructed the A320 pilot to descend to 5000ft and the controller then issued an avoiding action left turn instruction to the B787 pilot onto a heading of 070° at 1405:29. This instruction was blocked by another pilot's transmission and so was repeated but was again blocked by another transmission and so had to be repeated a third time before being acknowledged by the pilot of the B787 (1405:40).

At 1405:45 the controller instructed the A320 pilot to make an immediate turn to the right onto a heading of 105°, although the instruction did not include the phrase "avoiding action". This was acknowledged by the pilot who reported "level 5800ft" and "visual".

At 1405:49 the STCA, having momentarily disappeared, reactivated with a red alert (Figure 4).

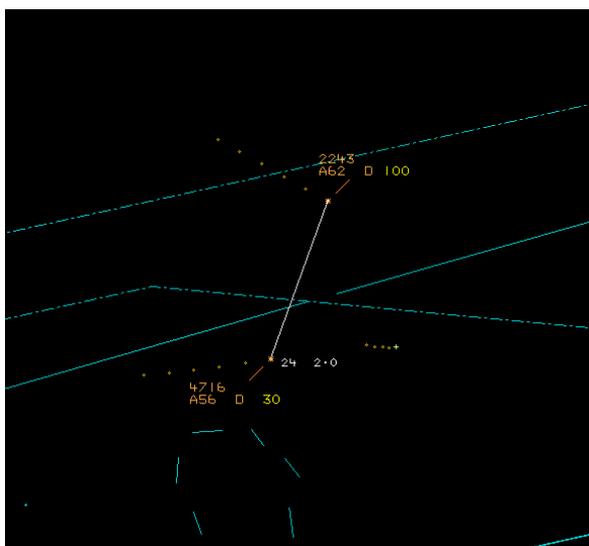


Figure 4 - Swanwick MRT – 1405:49.

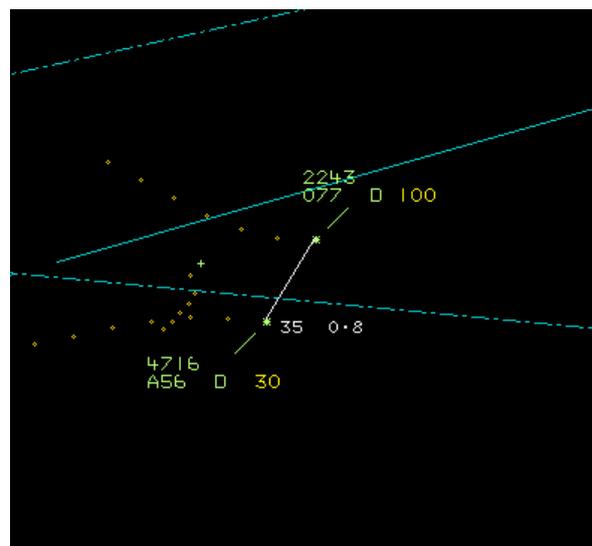


Figure 5 - Swanwick MRT – 1406:18

The lateral CPA occurred at 1406:18 with the aircraft separated by 0.8nm laterally and 2100ft vertically (Figure 5).

The Biggin Sector has responsibility for traffic in and out of the London TMA which is routing to the east and south-east of Heathrow and Gatwick up to FL195. Pilots on these routings departing London airports, including Heathrow and Gatwick, make their first call after departure to this sector. The controller reported that at this time the sector was “moderately busy and complex”. ATSI noted that transmissions were virtually continuous during this period, with some pilots apparently not listening out before transmitting. This was evidenced by the number of times the controller had to repeat an instruction during this period.

The B787 pilot was taken off his SID by the controller and placed on a radar heading. This was considered to be common practice, because a continuous climb on this SID is restricted by its proximity to both the Ockham (OCK) and the Biggin (BIG) Holds. To provide further climb and to avoid potential conflicts with inbound traffic later, the heading is allocated after clearing the OCK Hold to take the departure clear to the south of the BIG Hold.

The SIDs being flown by the B787 and the A320 pilots were deemed separated, and although the B787 pilot had been taken off their SID onto a more south-easterly track, standard separation still existed against the A320, because the profile of the SID being flown by the A320 pilot would have provided vertical separation against the B787.

It had been the controller’s intention to have the B787 pilot commence further climb first, with the A320 step-climbing beneath, as both aircraft were flight planned out of UK airspace via the same exit-point. The eventual loss of separation was as a direct result of the controller’s instruction to the A320 pilot to climb to 6000ft at 1404:21.

At interview, the controller commented that he had intended to climb the A320 pilot only to 5000ft, but said 6000ft without realising his mistake. This was evidenced by the flight progress strip (FPS) which showed climb instructions to “4A”, “5A” and “6A”, rather than just 4A and 6A. (The FPS did not show any of the avoiding action instructions).

The controller stated that he spotted the confliction and realised his mistake before the STCA had activated and had tried to resolve it by climbing the B787 pilot to FL100. This was delayed slightly by the need for the controller to repeat the instruction due to other pilot transmissions stepping on his own. He then believed that the climb instruction would be insufficient to resolve the conflict and so instructed the A320 pilot to descend back to 5000ft, just as the aircraft was passing that level. The controller then issued an avoiding action turn to the B787 pilot but again had to pass the instruction three times due to other pilot transmissions. Finally, the controller instructed the A320 pilot to make a turn to the right.

At 1405:47, the A320 Selected Flight Level (SFL) indicated 30, suggesting that the aircraft was descending to a level below that which had been instructed by the controller. This gave some cause for concern, as the aircraft’s track was taking it towards the Gatwick intermediate and final approach areas, at a level (potentially), that would bring it into conflict with Gatwick inbounds. A further enquiry was made of the aircrew of the A320, who subsequently stated that when they had received the instruction to descend again to 5000ft they had queried it with the controller. From the recording of the R/T it is believed that this enquiry was stepped on by the controller’s subsequent avoiding action turn instruction to the B787. The A320 pilot stated that *“whilst this was happening I saw the conflicting aircraft very close to us. I therefore wound the Altitude selector down and I incorrectly set 3000 in the FCU Altitude select window, I just wanted the aircraft to start descending (the Auto Pilot was engaged) and I was then planning to reset the altitude in the FCU window to the instructed 5000”*.

The A320 pilot confirmed that they had received a TCAS TA and that they subsequently disconnected the autopilot as they *“believed safety was compromised and manual flight would produce a more prompt response to the situation”*.

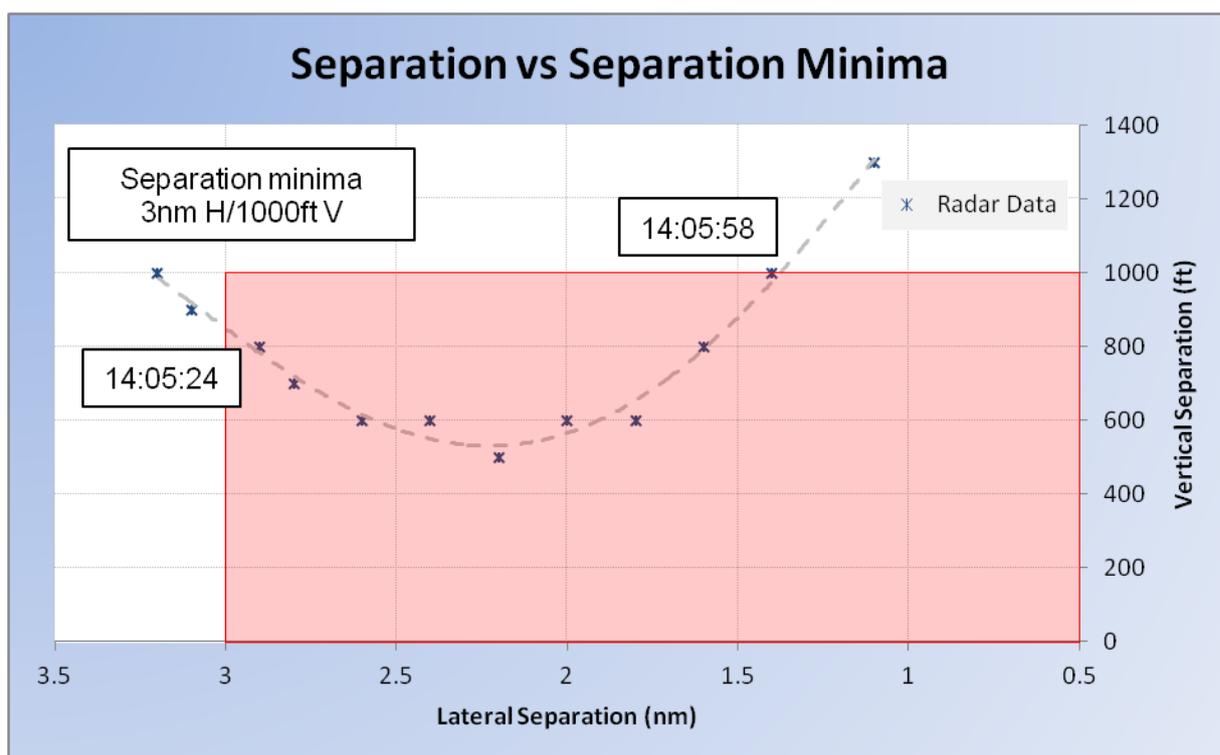
Vertical separation reduced to 600ft whilst the aircraft were still 1.8nm apart laterally. At the minimum distance laterally (0.8nm), the aircraft were separated by >2000ft vertically.

The conflict was resolved by the actions of the controller. At the time of the closest lateral distance more than the minimum standard vertical separation had been re-established, with the B787 passing FL077 and the A320, which had climbed as high as 5700ft before being observed in the descent again, passing 5600ft. Although the A320 made a “visual” report, it was not clear if this was in relation to TCAS or visual acquisition outside of the cockpit.

ATSI noted that throughout the incident, and the period immediately following it before the controller was relieved from his position, he remained calm and in control. The phraseology used for the initial avoiding action turn given to the B787 pilot was correct and complete. Efforts to seek an early resolution to the conflict were hampered by the blocking of the controller’s transmissions by the same single pilot who was apparently not listening out before transmitting.

UKAB Secretariat

The A320 and B787 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard¹. Notwithstanding that, in Class A airspace, ATC were required to separate the aircraft. The minimum slant range between aircraft occurred at 14:06:10 (CPA). Separation minima were lost at about 14:05:24 as the aircraft were within 1000ft as the lateral separation reduced through 3nm. Separation minima were regained at 14:05:58 as the vertical separation increased through 1000ft with a lateral separation of approximately 1.4nm, just less than half the required 3nm.



Summary

An Airprox was reported when an A320 and a B787 flew into proximity at 1406 on Wednesday 14th September 2016. Both pilots were operating under IFR, in receipt of a Radar Control Service from the TC Biggin Sector. A loss of standard separation occurred when the controller mistakenly instructed the A320 pilot to climb to 6000ft instead of the intended 5000ft.

¹ SERA.3205 Proximity.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the A320 pilot, the controller concerned, area radar and RTF recordings and reports from the appropriate ATC and operating authorities.

The Board was disappointed that no report was received from the foreign B787 pilot because this meant that they could not allow for his perception of what had occurred when coming to their conclusions. Notwithstanding, members felt that there was sufficient information available from the other reports with which to come to a conclusion.

The Board noted that both aircraft were under the control of the TC Biggin Sector, the B787 outbound from Heathrow and the A320 from Gatwick. Looking first at the actions of the TC Biggin controller, the Board was advised that the sector had been moderately busy and complex, but not at a level that was particularly out of the ordinary. It was noted that both aircraft were initially on their respective SIDs which ensured separation existed between the two flights. However, the B787 was then instructed to leave the SID routeing and take up a radar heading after passing Epsom. An Airline Pilot member with experience of operating from Heathrow commented that this was a usual occurrence on that route. Civil ATC members explained that it is necessary, in the interests of expediting traffic flow and allowing aircraft to climb as soon as possible, for controllers to take aircraft off their SIDs; because of the restricted airspace, it is the nature of TC sectors for aircraft to be placed on radar headings to allow climb and descent to take place between departing and arriving traffic.

On this occasion, the controller's intention was to maintain vertical separation between the two aircraft because they were routeing to the same exit point from UK airspace. Accordingly, he intended to instruct the A320 pilot to climb to 5000ft, under the B787 at 6000ft. However, inexplicably, he instructed the A320 pilot to climb to 6000ft, annotating the Flight Progress Strip with a climb to 5000ft. Compounding the situation, he did not register that the pilot had correctly read back the clearance to 6000ft instead of the expected 5000ft. This clearance now resulted in the two aircraft being on conflicting flight paths 5.5nm apart. Realising the impending conflict, the controller instructed the B787 pilot to climb to FL100 but this call was blocked by a transmission from another pilot. Shortly afterwards STCA activated and he issued avoiding action instructions to both pilots. However, the message to the B787 had to be repeated three times because each time the same pilot transmitted to block the frequency. The Board opined that this pilot's transmissions had prevented timely conflict resolution and this was considered to be a contributory factor. The Board considered that the controller had taken appropriate action when he had realised the situation; it was just unfortunate that this had been disrupted by his inability to pass the avoiding action information.

The Board noted that the A320 pilot reported that he had been passing 5800ft when the controller unexpectedly instructed him to descend to 5000ft. After selecting 5000ft on the Flight Control Unit, a TCAS TA was received. The pilot then decided to disconnect the autopilot and begin a manual descent. Airline Pilot members agreed that this was a reasonable decision and, although it might appear that the pilot was descending incorrectly in relation to a TCAS TA, he was only carrying out the descent to comply with ATC instructions. It was noted that the Selected Flight Level, displayed on the radar, initially showed FL30 before the pilot had selected manual operation. Airline members explained that on certain flight decks, possibly on this A320, one click on the altitude select knob changes the selection by 1000ft in certain modes and that it was likely that the selection of an altitude below 5000ft was understandable in the pilot's attempt to ensure an expeditious descent on autopilot, provided it was corrected as soon as possible.

The Board then looked at the barriers that were relevant to this Airprox and decided that the following were key contributory factors:

- **Airspace Design and Procedures** was considered to be only **partially effective** because the TC controllers necessarily have to take aircraft off SIDs, which are designed to separate different departures from each other, in order to ensure an expeditious flow of air traffic.

- **ATS Conflict Detection and Resolution** was only **partially effective** because the controller had not realised that he had climbed the A320 pilot to an incorrect level. Additionally, the frequency was blocked by another pilot, which had prevented timely conflict resolution.

The Board then turned its attention to the cause and risk of the Airprox. It was quickly and unanimously agreed that the Airprox had occurred because the TC Biggin controller had inadvertently climbed the A320 into conflict with the B787. As to the risk, the Board noted that the minimum separation was 5-600ft vertically at 1.8nm horizontally, and that standard separation was only regained vertically at 1.4nm as the aircraft separated above 1000ft; the result being that as the situation was resolved, separation was reduced to just less than 2/3 of the required 1000ft/3nm. Some members thought that the erosion of separation to this extent meant that safety was not assured and had been much reduced below the norm; however, the majority felt that although safety had been degraded, there had been no possibility of a collision because the A320 pilot had been visual with the B787 and had expedited his descent. Noticeably, the A320 pilot had not received a TCAS RA, and this was also a factor in the Board’s deliberations on risk. Accordingly, the Airprox was assessed as risk Category C.

PART C: ASSESSMENT OF CAUSE AND RISK

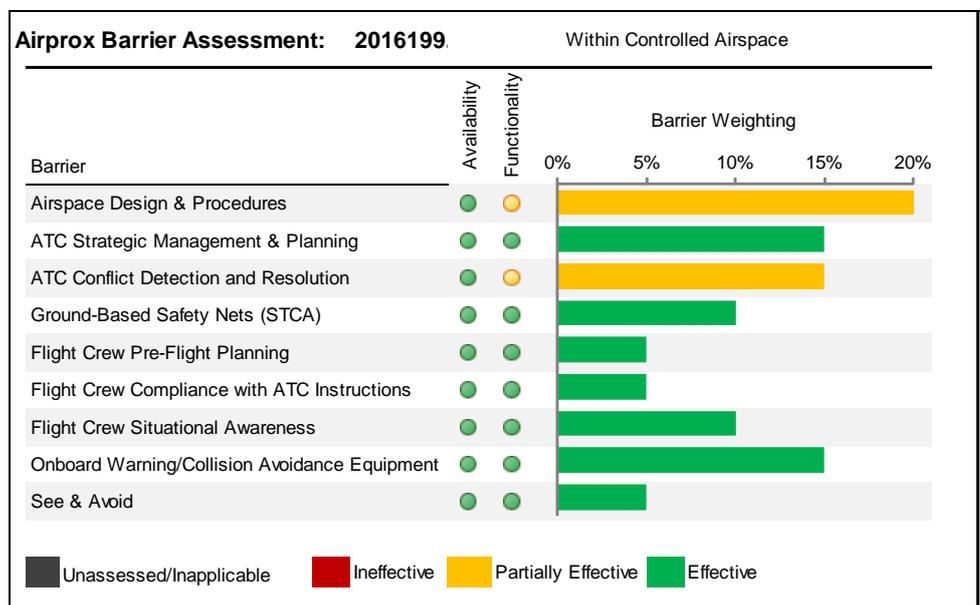
Cause: The Biggin TC controller inadvertently cleared the aircraft into conflict.

Contributory Factor: One pilot’s transmissions blocked the Biggin TC controller, preventing timely conflict resolution.

Degree of Risk: C.

Barrier Assessment²:

Modern safety management processes employ the concept of safety barriers that prevent contributory factors or human errors from developing into accidents. Based on work by EASA, CAA, MAA and UKAB, the following table depicts the barriers associated with preventing mid-air-collisions. The length of each bar represents the barrier's weighting or importance (out of a total of 100%) for the type of airspace in which the Airprox occurred (i.e. Controlled Airspace or Uncontrolled Airspace).³ The colour of each bar represents the Board's assessment of the effectiveness of the associated barrier in this incident (either Fully Effective, Partially Effective, Ineffective, or Unassessable/Absent). The chart thus illustrates which barriers were effective and how important they were in contributing to collision avoidance in this incident.



² The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the [UKAB Website](#)

³ Barrier weighting is subjective and is based on the judgement of a subject matter expert panel of aviators and air traffic controllers who conducted a workshop for the UKAB and CAA on barrier weighting in each designation of airspace.

