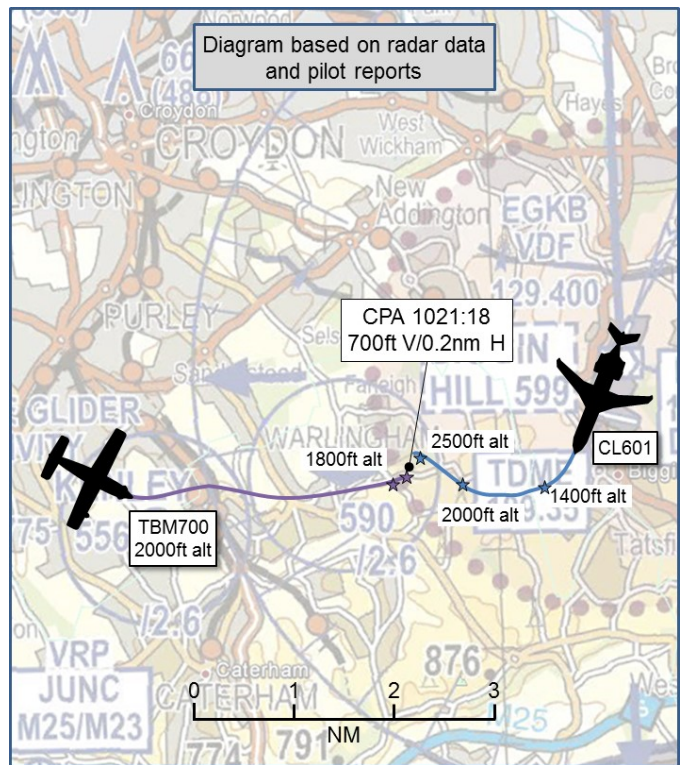


**AIRPROX REPORT No 2017024**

Date: 24 Feb 2017 Time: 1021Z Position: 5118N 00001W Location: 2nm WSW Biggin Hill

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

Recorded	Aircraft 1	Aircraft 2
Aircraft	CL601	TBM700
Operator	Civ Exec	Civ Pte
Airspace	London FIR	London FIR
Class	G	G
Rules	IFR	VFR
Service	Aerodrome	Aerodrome
Provider	Biggin Hill	Biggin Hill
Altitude/FL	↑2500ft	1800ft
Transponder	On/C, S	On/C, S
Reported		
Colours	White, Blue	White, Black, Grey
Lighting	Nav, Strobe, Taxi, Beacon	Strobe, Nav
Conditions	VMC	VMC
Visibility	10km	10km
Altitude/FL	1900ft	2000ft
Altimeter	QNH (1016hPa)	NK
Heading	250°	Not reported
Speed	160kt	165kt
ACAS/TAS	TCAS II	TCAS I
Alert	RA	TA
Separation		
Reported	0ft V/500m H	NK
Recorded	700ft V/0.2nm H	



**THE CL601 PILOT** reports that whilst he was taxiing to the holding point of RW21 he heard an aircraft being told to orbit at the end of the downwind leg for RW21. Whilst holding at the holding point both crew members became visual with this traffic that appeared to be a Cessna 152. The controller instructed him to line up and wait after a landing Citation. No other traffic information was passed. At approximately 1020, ATC cleared him for takeoff and again no traffic information was passed with this clearance. On departure he followed the standard departure procedure to turn right 10 degrees and track 220 degrees until 1nm BIG. The procedure then commands a right turn to position back through the overhead to track 095° outbound to DET climbing to 2400ft. As they passed through approximately 250° at an altitude of 1600ft, they received a TCAS TA of traffic directly ahead and 300ft above. He instructed the FO, who was pilot flying, to continue with the departure whilst he monitored the traffic on the TCAS display and tried to acquire visual contact. Almost immediately after this they received a TCAS RA climb and, at the same time, he acquired visual contact with the traffic. They continued to follow the instructions given for the RA whilst he continued to track the aircraft visually. They became clear of conflict once they had reached 2900ft. This was the first time, due to other radio traffic on the frequency, that a call could be made to Biggin Hill ATC; a TCAS RA was issued over the frequency and, at the same time, a clear of conflict returning to 2400ft. The controller acknowledged this. They were then instructed to contact Thames Radar and on read back he informed ATC he would be filling a report on the TCAS RA. The flight continued without further incident.

He assessed the risk of collision as 'Medium'.

**THE TBM700 PILOT** reports that he was approaching Biggin Hill at 2400ft from the west. He was cleared to join RH downwind RW21 with a caution for Kenly gliding site, to which he passed north.

As he called joining downwind he was instructed to orbit. He was descending at this time to join so he stopped his descent at 2000ft and held. He believes there was traffic in the circuit ahead of him which was the cause of his delay. He was between Biggin Hill and Kenley so could not extend far to the west, and he was aware there was circuit traffic and so did not wish to descend any further in case of conflict with that traffic. He heard the Challenger being cleared to take off and he believed it was given a right turn at one mile climbing to 2400ft. He was orbiting and looking for the aircraft knowing it was heading in his direction. As he turned towards the south and west he saw the aircraft was already climbing above him; at that point it was close but he didn't know where it was heading. The other pilot saw him and pulled up, he thinks he also pushed forward for a few moments but by the time he had seen him realistically the Airprox was over. He believes that with a right turn back into the overhead from RW21 there was always going to be a conflict with him orbiting on the downwind leg, and only altitude was going to separate him from the other aircraft. He believes that had he been told to orbit at a prescribed altitude separated from the circuit traffic, and the other pilot instructed not to turn back until above that altitude, that would have been the only way to ensure separation, although he comments that this is easy to say afterwards.

**THE BIGGIN HILL CONTROLLER** reports that he was on duty as an OJTI in the combined position of Tower and Approach with a student under a high workload. The CL601 was departing from RW21 at Biggin Hill on the standard departure route which is a right turn back to the overhead climbing to 2400ft. The TBM700 had been holding to the west of the field waiting to join the visual right-hand circuit for RW21 and was instructed to join downwind. The circuit altitude at Biggin is 1600ft, but it appears that the TBM700 joined at 2000ft, leading to a conflict with the departing jet, which received a TCAS RA and climbed to resolve the conflict. The weather was good VFR and the traffic level was high, which probably led to the failure to monitor the joining traffic's level.

## Factual Background

The weather at Biggin Hill was recorded as follows:

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METAR EGKB 241020Z 30009KT 280V340 9999 SCT025 05/00 Q1016
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## Analysis and Investigation

### CAA ATSI

An Airprox was reported by the pilot of a Bombardier Canadair Challenger CL601-3A (CL601) when it came into proximity with a Socata TBM700 approximately 2.5nm west of Biggin Hill. The CL601 (code 2233) was an IFR departure from Biggin Hill in receipt of an Aerodrome Control Service from Biggin Hill Tower. The TBM700 (code 7047) was inbound to Biggin Hill, VFR, also in receipt of an Aerodrome Control Service from Biggin Hill Tower. ATSI had access to reports from the pilot of the CL601 and the air traffic controllers involved. A full field investigation and an interview with the controllers was undertaken. The local area radar and radio recordings were also reviewed. Screenshots produced in this report are provided using recordings of the Swanwick MRT Radar. Levels indicated are altitudes. All times UTC.

At 1003:18 the CL601 called Biggin Hill Tower to request start-up.

At 1007:23 the CL601 called for taxi and a departure from Runway 21 was agreed.

At 1009:15 the controller issued the departure clearance to the CL601 which consisted of a 'LYD 2' departure and instructions to climb to 2400ft. The SSR code of 2233 was assigned.

At 1016:02 (Figure 1) the TBM700 called Biggin Hill Tower and Approach (the two ATC services were combined). The TBM700 was approximately 12nm west of Biggin Hill. The controller asked the TBM700 to standby for joining clearance and then continued with other tasks, including the issue of a conditional line-up clearance to the CL601.

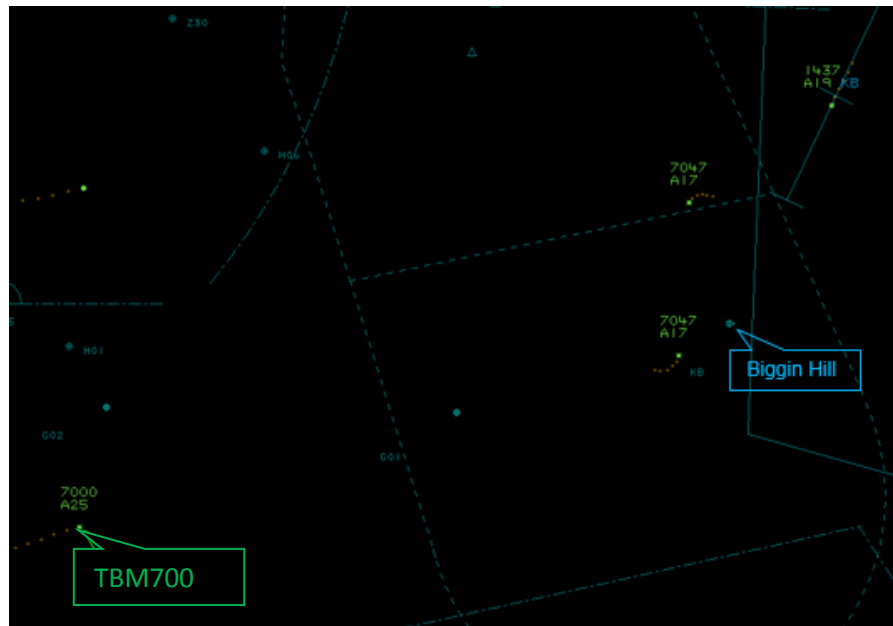


Figure 1 – 1016:02

At 1017:08 (Figure 2) the controller returned to the TBM700 who reported at 7nm and 2000ft to request joining instructions.

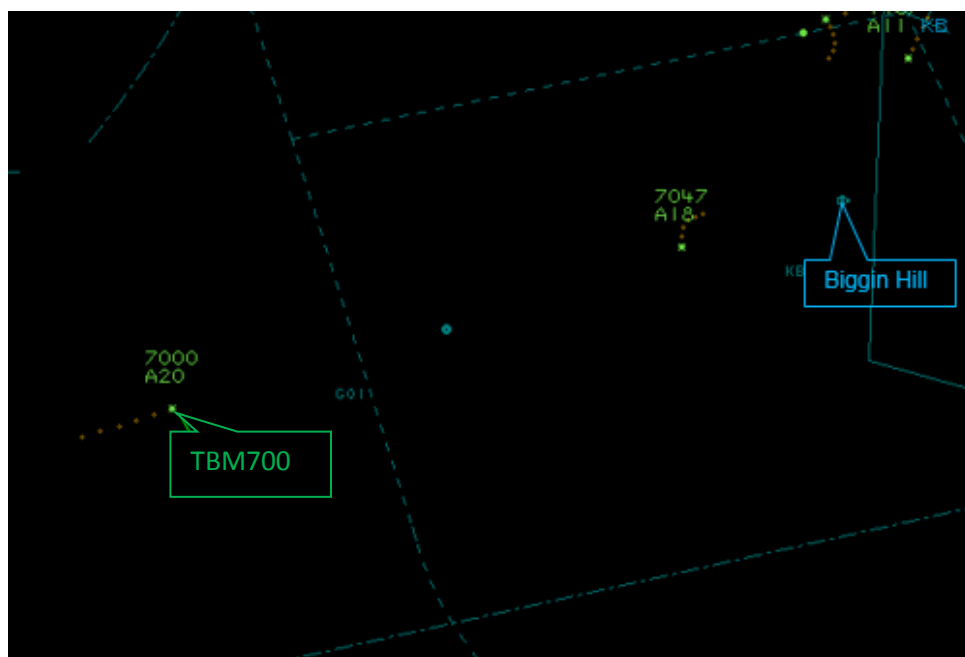


Figure 2 - 1017:08

At 1017:25 the controller advised the TBM700 to expect a right-hand circuit for runway 21 and to report at 5nm – SSR code 7047 was issued. As the TBM700 immediately reported approaching 5nm, the controller instructed the pilot to hold and that they would call them back.

At 1019:10 the controller cleared the CL601 for take-off.

At 1019:42 (Figure 3) the controller instructed the TBM700 to join downwind right-hand for runway 21, and to report downwind. The TBM700 was in a left hand orbit 5.8nm west of Biggin Hill at this time. Information was issued concerning the traffic ahead, and that the TBM700 was number 3 in the traffic sequence.

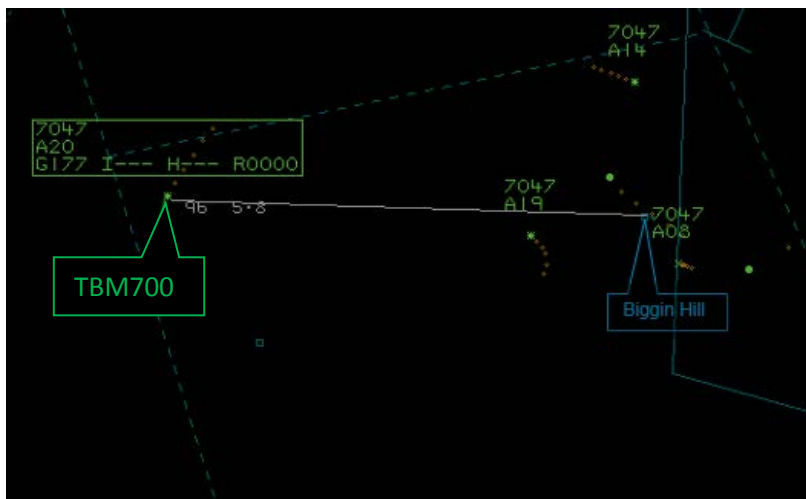


Figure 3 – 1019:42

At 1020:55 (Figure 4) the CL601 was airborne and passing an indicated 1800ft having made a right turn after departure as required by local procedures.

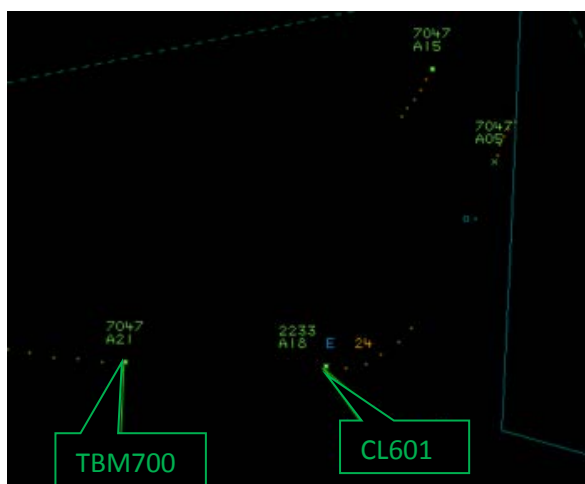


Figure 4 - 1020:55

CPA occurred between 1021:12 (Figure 5) and 1021:18 (Figure 6) with the minimum distance indicating 0.2nm and 700ft in both screenshots.

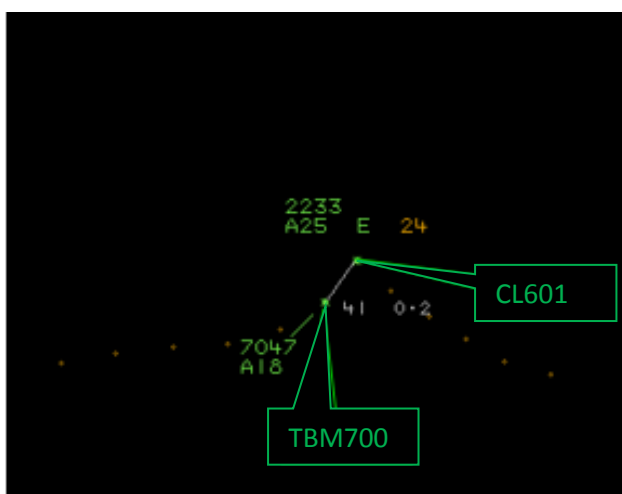


Figure 5 1021:12



Figure 6 1021:18

At 1021:26 the CL601 pilot reported that they had climbed to 2800ft in response to a TCAS RA.

The provision of Aerodrome and Approach Control services at Biggin Hill were combined, as they are routinely. These services were being provided by a trainee controller under the supervision of an On-the-job Training Instructor (OJTI). The trainee controller was approaching a standard just prior to validation (formal qualification), and had sufficient experience and capability to handle the heavy traffic loading that was prevalent at the time. The OJTI had in excess of 20 years' experience at Biggin Hill.

Biggin Hill is located outside controlled airspace and has an Aerodrome Traffic Zone established to a radius of 2nm and extending to 2000ft. The airspace remains Class G. From 2500ft above Biggin Hill is the London TMA which is designated Class A.

IFR departures from RW21 are required to follow a set noise abatement procedure (Figure 7):

**(a) Runway 21 Departures**

- (i) After passing the upwind end of the runway, turn right to make good a track of 220° MAG. At 1.0 DME BIG commence right turn on the appropriate Standard Departure Route to pass over the BIG VOR/DME, or establish on track as instructed by ATC. Due to the radius of the turn, speed control will be required to achieve the required flight path. Suggested maximum speed is 185 kts.
- (ii) Due to the proximity of Kenley gliding site during the right turn remain within 4 nm DME BIG.
- (iii) Due to the proximity of City airport traffic avoid any deviation north of the prescribed track.

Figure 7 – Noise abatement procedures

As Biggin Hill is situated underneath the London TMA, IFR departure clearances are subject to co-ordination with Thames Radar, the TC sector responsible for traffic in this area of the London TMA. The initial clearance is obtained by the Air Traffic Control Assistant, but the actual permission for the aircraft to depart (known as the release) is obtained directly by the Tower Controller from TC. Biggin Hill Tower has an Aerodrome Traffic Monitor (ATM) to enable the controllers to gain a wider knowledge of local traffic than is possible from visual sighting from the VCR alone.

The SSR code 7047 is a London Terminal Control (TC) code which is delegated for Biggin Hill to use for traffic which is working that unit. Whilst the primary purpose of this code is for conspicuity, it helps TC identify which unit an aircraft is working. Additionally, applying this code helps the situational awareness of the Biggin Hill controllers when combined with using the ATM. Aircraft using this code are not positively identified and heights indicated are not verified. There should be no expectation that a surveillance service is being afforded by selecting this code.

The TBM700 request for joining clearance at 7nm was timely and consistent with the range most inbound VFR aircraft request such a clearance. At interview the controllers did observe that they were surprised by the speed of the TBM700, which the radar recordings endorse. In Figure 3 and Figure 6, the ground speed of the TBM700 can be seen to be 177kts and 185kts respectively, somewhat higher than the speed most light aircraft join the circuit at.

The OJTI and trainee were both interviewed and confirmed that Traffic Information, including that pertaining to departing aircraft, should be passed to VFR joining traffic when they are cleared to join the circuit. In addition, Traffic Information should be passed to departing IFR aircraft about VFR circuit joining aircraft when appropriate prior to departure. Neither aircraft in this occurrence were advised about the other aircraft. The combination of a high level of traffic, the training environment for the Air Traffic Controllers and the relative high speed of the inbound TBM700 are likely to have contributed to the oversight in providing Traffic Information. Both the trainee controller and OJTI commented that had they been less busy, it was likely that they would have noted the inbound track and speed of the TBM700 sooner. They would then have tactically controlled either the inbound track of the TBM700 or delayed the CL601 departure to ensure more segregation of traffic. There is, however, no requirement for ATC to separate aircraft, even with the provision of Traffic Information - under an Aerodrome and Approach Control Service in Class G airspace a controller is not required to separate IFR from VFR flights and pilots remain

responsible for their own collision avoidance. The absence of Traffic Information to either aircraft was a missed opportunity for either aircrew to gain situational awareness and conduct their flights to ensure that the flight paths did not bring them into proximity.

## **UKAB Secretariat**

The CL601 and TBM700 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard<sup>1</sup>. If the incident geometry is considered as converging then the TBM700 pilot was required to give way to the CL601<sup>2</sup>. An aircraft operated on or in the vicinity of an aerodrome shall conform with or avoid the pattern of traffic formed by other aircraft in operation<sup>3</sup>.

## **Summary**

An Airprox was reported when a CL601 and a TBM700 flew into proximity at 1021 on Friday 24<sup>th</sup> February 2017. Both pilots were operating in VMC in receipt of an Aerodrome Control Service from Biggin Hill, the CL601 pilot under IFR and the TBM700 under VFR.

## **PART B: SUMMARY OF THE BOARD'S DISCUSSIONS**

Information available consisted of reports from the pilots of both aircraft, radar photographs/video recordings, a report from the air traffic controller involved and a report from the appropriate ATC authority.

The Board began their discussions by looking at the actions of the controllers. Acknowledging that the busy R/T increased the controller's workload, members were surprised that the experienced OJTI did not assimilate the speed of the TBM700, and was apparently not aware that a TBM700 will fly faster than most light aircraft. Members were also concerned that the controllers assumed the TBM700 would be at an altitude of 1600ft but did not instruct the aircraft to join at that height, thereby not agreeing an altitude at which to transit into the visual circuit with the TBM700 pilot. This was especially relevant given that they knew the CL601 would be departing and climbing to the north, through the TBM700's track. The Board quickly agreed that the ATCO should have at least passed Traffic Information to both aircraft to ensure the pilots had information available to enhance their Situational Awareness regarding the other traffic. Although there is no requirement to separate IFR and VFR traffic in Class G airspace the Board opined that it would have been prudent for the controllers to have held the CL601 on the ground either until Traffic Information had been passed (and acknowledged) or the TBM700 was established downwind.

The Board then turned to the actions of the CL601 crew. In the absence of any Traffic Information on the TBM700, they had adopted the standard departure routing which would have required considerable attention to in-cockpit instruments as part of their IFR departure climb and turn. Having then been alerted by the aircraft's TCAS, the CL601 crew had correctly followed the TCAS RA commands and had also visually acquired the TBM700. Other than a reminder of the need to maintain a robust lookout in Class G airspace even when under IFR, the Board opined that there was little more the CL601 crew could have done in the circumstances given that they were not aware of the TBM700. For his part, the Board noted that the TBM700 pilot was aware that the CL601 was departing and heading in his direction. He commented that he was already in his orbit at that point and members opined that he would have been better served in maintaining this orbit further west rather than proceeding to the downwind given that there was a likely conflict situation unfolding. However, it was accepted that he had been given clearance to join downwind by ATC (only 30secs after the CL601 had been cleared to take off), and so he had proceeded on that basis presumably in the belief that ATC would have sequenced the 2 aircraft.

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<sup>1</sup> SERA.3205 Proximity.

<sup>2</sup> SERA.3210 Right-of-way (c)(2) Converging.

<sup>3</sup> SERA.3225 Operation on and in the Vicinity of an Aerodrome.

The Board then considered the cause and risk of the incident. Members quickly agreed that the Biggin Hill controllers had released the CL601 into conflict with the TBM700. Notwithstanding that the TBM700 pilot had assimilated from the R/T that the CL601 was departing Biggin, members felt that contributory to the incident was that ATC had not passed Traffic Information to either pilot thereby reducing their ability to ensure that they avoided each other. Turning to the risk, members agreed that the CL601 pilot had responded correctly to the TCAS RA such that although safety had been reduced, his actions had ensured that there was no risk of collision; accordingly, the Board assessed the risk as Category C.

### **PART C: ASSESSMENT OF CAUSE AND RISK**

**Cause:** Biggin Hill released the CL601 into conflict with the TBM700.

**Contributory Factors:** Lack of Traffic Information to either pilot.

**Degree of Risk:** C.

#### **Safety Barrier Assessment**<sup>4</sup>

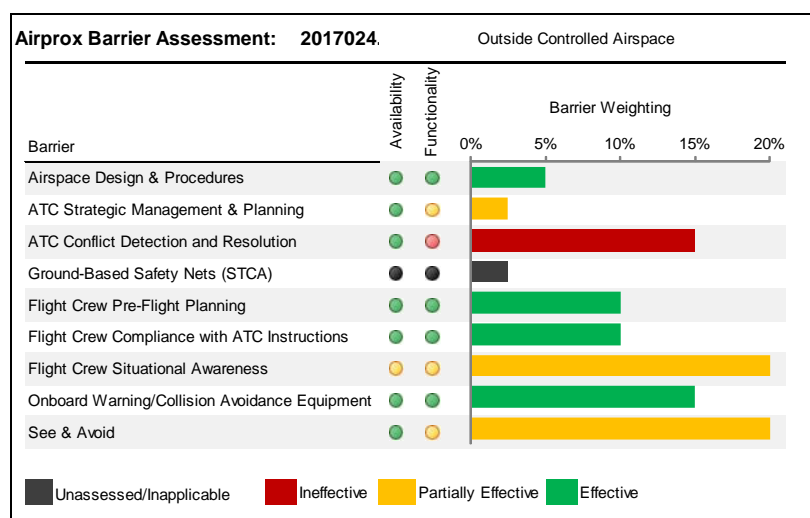
The Board decided that the following key safety barriers were contributory in this Airprox:

**ATC Strategic Management and Planning** was considered to be **partially effective** because the traffic situation was busy and this should have prompted the Approach and Tower positions being spilt rather than them being banded, which resulted in only one control position that unnecessarily increased controller workload.

**ATC Conflict Detection and Resolution** was considered to be **ineffective** because the Biggin Hill controllers did not pass Traffic Information to either aircraft on the other, or provide adequate separation between the departing IFR aircraft and the inbound VFR aircraft.

**Flight Crew Situational Awareness** was also considered to be **partially effective** because neither pilot was passed Traffic Information by the Biggin Hill controllers, therefore neither aircraft was specifically aware of the other (although the TBM700 pilot was generically aware that the CL601 was departing Biggin).

**See and Avoid** was considered to be **partially effective** because the CL601 pilot only saw the TBM700 as he received a TCAS RA, and the TBM700 pilot did not see the CL601 until after CPA.



<sup>4</sup> The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the [UKAB Website](#).