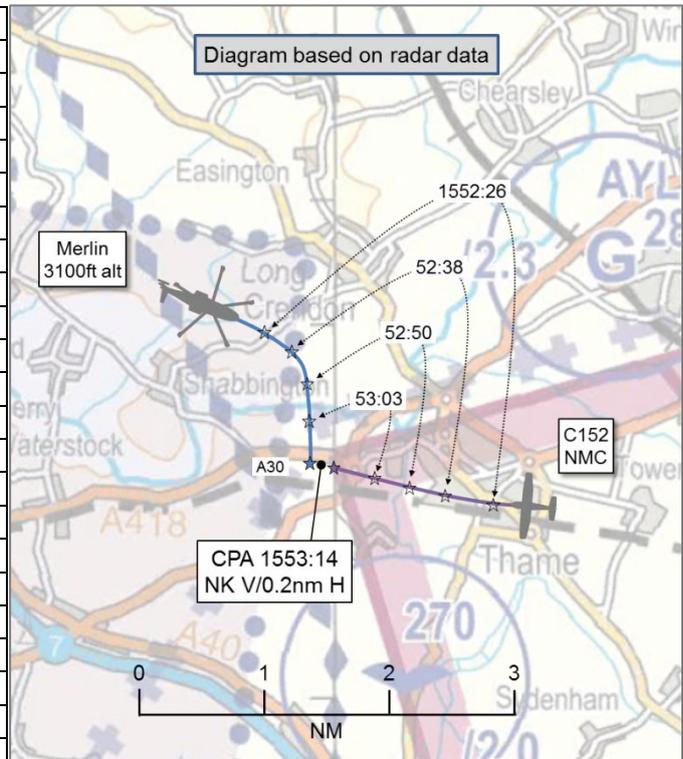


**AIRPROX REPORT No 2016018**

Date: 16 Feb 2016 Time: 1555Z Position: 5145N 00100W Location: 10nm N Benson

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

Recorded	Aircraft 1	Aircraft 2
Aircraft	Merlin	C152
Operator	HQ JHC	Civ Pte
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	Traffic	Basic
Provider	Benson App	Benson
Altitude/FL	3100ft	NMC
Transponder	A, C, S	A, (C not fitted)
Reported		
Colours	Olive Green	White, Grey
Lighting	Nav, Landing	Tail Beacon
Conditions	VMC	VMC
Visibility	15km in haze	10km
Altitude/FL	3100ft	2300ft
Altimeter	QNH (1034hPa)	QNH
Heading	135°	275°
Speed	100kt	95kt
ACAS/TAS	Not fitted	Not fitted
Separation		
Reported	150-200ft V/ 200m H	Not seen
Recorded	NK V/0.2nm H	



**THE MERLIN PILOT** reports that he was conducting a compass calibration flight and receiving a Traffic Service from Benson Approach. The controller called traffic ‘9 o’clock, 1nm’. The pilot looked in the direction of the traffic and saw a high-wing Cessna between 150 and 200ft below at a range of no more than 200m, it flew directly below his aircraft. It was too late to take any avoiding action and it appeared that the other pilot didn’t change course or level either. The pilot asked ATC if they had contact with the other pilot and whether he had been visual; they replied that he was receiving a service from another controller, was at 2200ft, and had not been visual with them. If ATC had not called the traffic, and if they had been any lower, the pilot thought that there would have been a very high risk of collision. During the compass calibration, workload was moderate, with the handling pilot flying the octagonal pattern and the non-handling pilot looking out; the crewman was also assisting with look-out and neither had seen the other aircraft. He noted that it was hazy and the white colour of the other aircraft made it difficult to see.

He assessed the risk of collision as ‘High’.

**THE C152 PILOT** reports that he was talking to Benson Radar in the Princes Risborough area and had requested a MATZ-crossing clearance to cross the Benson stub. His recollection was that the clearance was at 2300 or 2400ft and that he had read back the clearance and maintained the height instructed. He had set the Benson QNH as instructed, and he later transited the Brize Zone and didn’t notice any peculiarities in his pressure setting. He recalled that the airspace around Benson was busy, and he was aware of traffic all around, although didn’t recall seeing the Merlin above him, he noted that the C152, being fixed-wing, had poor visibility upwards. In subsequent conversation with the UKAB secretariat, he recalled being asked by Benson ATC whether he had seen a helicopter, he recalled that he had seen a light coloured helicopter 500ft below and 2 or 3 miles to the left, moving towards the 12 o’clock, he did not consider this to be an Airprox position. [UKAB note: the radar replay indicates that the C152 did pass another aircraft indicating 1700ft and following the profile described, shortly before passing the Merlin.]

**THE BENSON APP CONTROLLER** reports that he was providing a Traffic Service to the Merlin pilot, who was on a VFR air-test; it was the only aircraft on frequency. When the Merlin was in a position 10nm north of Benson routing south, the controller noticed a group of contacts to the east of the Merlin's position, but he did not think that they would affect, so did not give Traffic Information. He looked away from the Merlin for a short while and when he looked back he saw that one of the contacts, which was wearing a Benson Zone squawk, had broken away from the group and was now tracking towards the Merlin. There was no height information showing and, after he had passed the Traffic Information, the pilot initially responded that he couldn't see the traffic, but there was clear indication in the pilot's voice that he then became visual with an aircraft at close range. Whilst receiving that transmission, the controller was requesting the height of the conflicting traffic from the Zone Controller, but the answer came back after the closest point of conflict had occurred. Once he had told the Merlin pilot that the other aircraft was believed to be at 2200ft, he replied that it was unlikely that the aircraft was that low below him. Shortly afterwards the Merlin pilot announced his intention to report an Airprox.

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

**THE BENSON ZONE CONTROLLER** reports that at the time of the incident he had been on console for 2 hours, during medium intensity traffic conditions. There were approximately 3 aircraft on frequency at the time, all on a Basic Service. The C152 was on navigational exercise and under a Basic Service. The C152 pilot had been given permission to transit the northern stub of the Benson MATZ, and the controller then turned his attention to his other aircraft. The C152 didn't have Mode C so it was only when he got close to a Benson Approach squawk that the controller questioned his height. The pilot confirmed that he was at 2200ft. After hearing the Approach Controller mention an Airprox, he asked the C152 pilot whether he had seen a helicopter in his vicinity, he replied that he had seen one cross from right to left.

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

**THE BENSON SUPERVISOR** reports that at the time of the incident the Approach controller was working one aircraft and the Zone Controller was controlling 2, 'gusting 3'. The Supervisor was listening to the Approach frequency, but not the zone frequency. Traffic levels and complexity were low and there was some chat, although not whilst the Zone Controller was transmitting to aircraft. The Supervisor was watching the radar screen and could see the Merlin was entering an area of high traffic density, he could see an aircraft with a Zone squawk tracking towards the Merlin and instructed the Approach controller to call the traffic, which he immediately did. The conflicting track was not showing a height read-out, so the altitude was sought from the Zone Controller and passed to the Merlin, although the Supervisor could not remember whether this happened before or after he had called visual. The Approach Controller was then instructed to limit the Traffic Service due to high traffic density because there were multiple tracks in the vicinity. The Merlin pilot stated his intention to file an Airprox and so the Supervisor relieved both controllers in order to begin the reporting process.

## Factual Background

The weather at Benson was recorded as follows:

METAR EGUB 161550Z 18012KT 9999 FEW032 BKN300 06/M00 Q1030 BLU NOSIG=

The relevant transmissions from the tape transcript are in the table below:

To	From	Speech Transcription	Time
C152	Zone	{C152 callsign} apologies golf zulu whiskey request your current altitude	15:52:48
Merlin	RA	{Merlin callsign} traffic east one mile tracking west no height information	15:52:51
Zone	C152	Eg { C152 callsign} two thousand two hundred	15:52:55

To	From	Speech Transcription	Time
RA	Merlin	{Merlin callsign} is lookin-Oh*	15:52:57
RA	Merlin	Er {Merlin callsign} visual with the traffic is he .... Is he working you?	15:53:07
Merlin	RA	{Merlin callsign} affirm standby	15:53:11
Merlin	RA	{Merlin callsign} last reported???? thousand two hundred feet .....	15:53:22
Merlin	RA	that's with the zone controller	15:53:27
RA	Merlin	Er {Merlin callsign} he was not eight hundred feet below us	15:53:31
Merlin	RA	{Merlin callsign} approach roger he's got no Charlie showing	15:53:39
RA	Merlin	Er that's copied {Merlin callsign}	15:53:45
Merlin	RA	{Merlin callsign} reduced traffic inform-information from all around due to high traffic density	15:53:53
C152	Zone	{ C152 callsign} did er you see a rotary approximately er three minutes ago	15:54:50
Zone	C152	Er we believe we saw one right to left { C152 callsign}	15:55:00
C152	Zone	{ C152 callsign} roger	15:55:04

## Analysis and Investigation

### Military ATM

At 1552:48 (Figure 1), the Merlin is 1.3nm NW of the C152, no Traffic Information had been passed by the Approach Controller. At this time The Zone Controller was requesting altitude information from the C152. There is no Mode C showing on the C152 or the 4 tracks to the east of the C152.

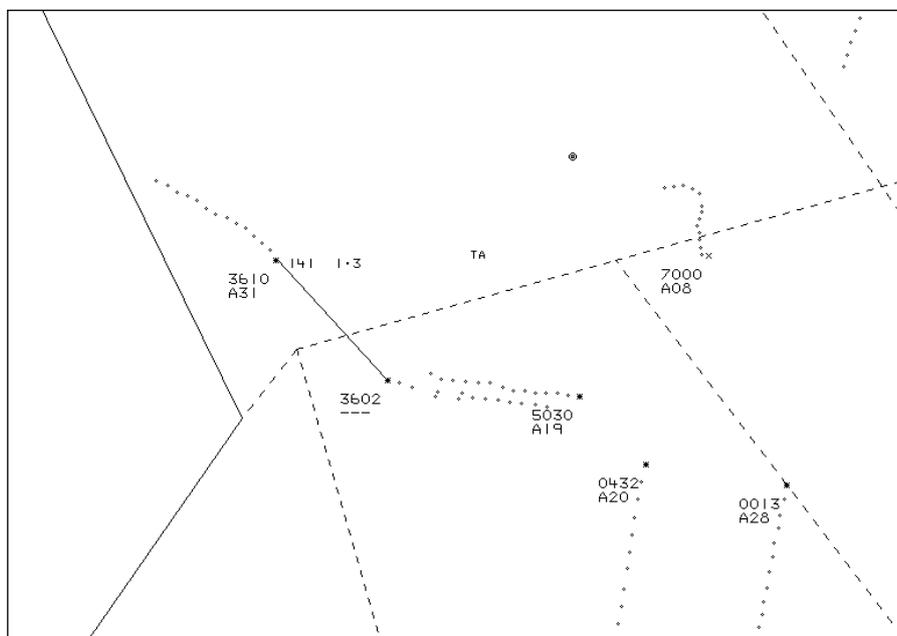


Figure 1: Merlin squawking 3610; Cessna 3602.

At 1552:52 (Figure 2), the Merlin is tracking south and the C152 west, one second before this the Approach controller passed Traffic Information to the Merlin on the C152.

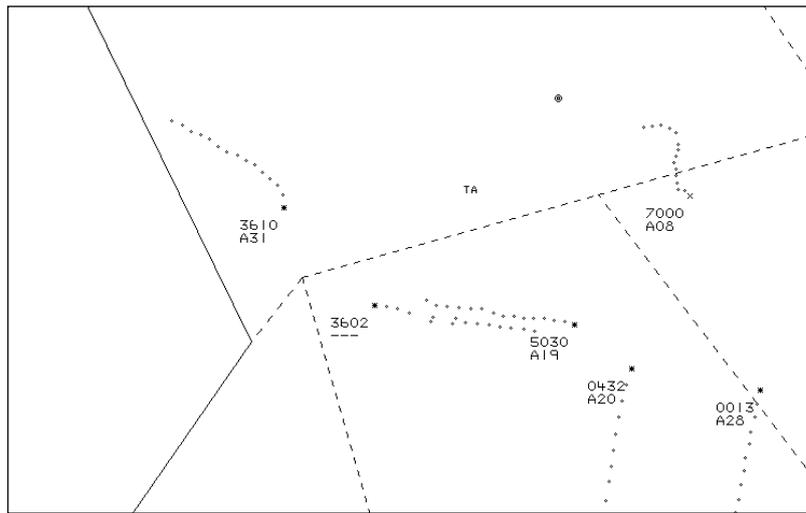


Figure 2: Geometry at 1552:52.

At 1552:55 (Figure 3), the C152 pilot reports his altitude to the Zone Controller, and 2 seconds later the Merlin reports that he is looking; the transcript appears to indicate surprise in his voice.

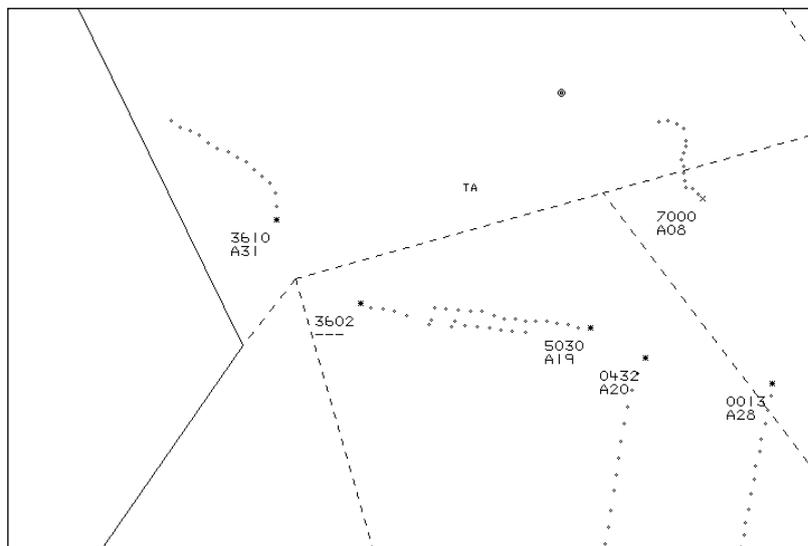


Figure 3: Geometry at 1552:55.

At 1553:07 (Figure 4), the Merlin pilot reports to Approach that he is visual with the C152.

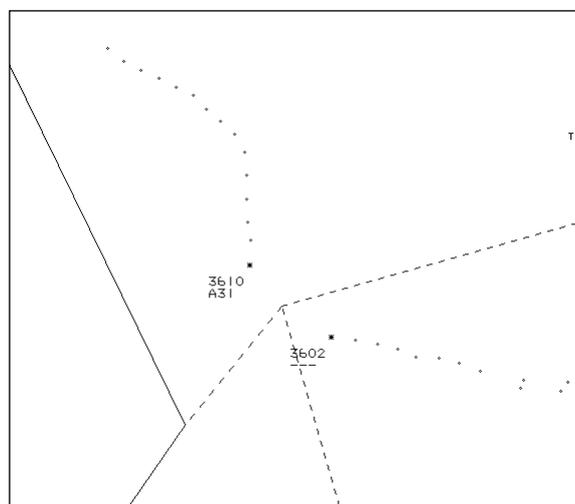


Figure 4: Geometry at 1553:07.

The CPA was at 1553:17 (Figure 5, 1553:15) and estimated at 0.2nm horizontal separation.

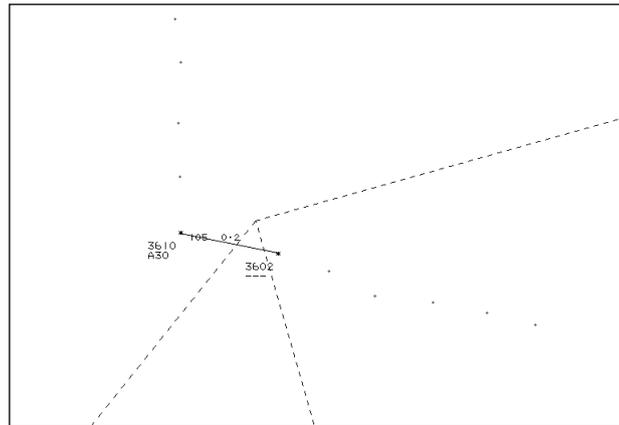


Figure 5: CPA at 1553:15.

The Merlin helicopter pilot was receiving a Traffic Service from Benson Approach whilst conducting a compass calibration. CAP 774 states that, under a Traffic Service, 'the controller is not required to achieve deconfliction minima, and the pilot remains responsible for collision avoidance'. It also states that 'Pilots should be aware that a Traffic Service might not be appropriate for flight in IMC or where lookout is significantly constrained by other factors, when other ATs are available'. A Traffic Service was an appropriate type of service for the sortie profile. In this case the handling pilot was conducting a compass calibration with the non-handling pilot and the crewman conducting lookout; the haze at the time and colour of the white C152 would have made it difficult to visually acquire. An area for further consideration would be the communication of the type of sortie (airtest) between the aircraft crew and ATC prior to flight and location of the flight near well-known GA navigation routes. Discussion with Benson ATC indicated that airtests are normally notified on the electronic tote (in ATC) or verbally on startup, and the aircraft will request a Traffic Service.

The C152 pilot was under a Basic Service and had requested a MATZ crossing of Benson's northern stub. His routing was one he was familiar with as a regular airspace user; however, it is of note that the pilot reported he was unfamiliar with the Merlin aircraft and that it was flown from Benson. The local investigation noted that the Class G airspace around Benson is complex and restrictive, with the base of controlled airspace stepping from 4500ft to 3500ft between Wycombe Airpark and Thame. GA traffic is confined laterally by local ATZs, Benson MATZ and the London TMA and, in addition to this, the use of common visual navigation points can lead to a bottleneck in GA traffic. The pilot reported his awareness of traffic; the radar replay indicates the C152 had transited east to west through 4 other tracks at similar altitudes. Both the C152 and Merlin were on the same pressure setting (Benson QNH); the highest reported altitude of the C152 was 2400ft and the Merlin was maintaining 3000ft. The high wing configuration of the C152 and position of the sun may have impeded the pilot's lookout, especially given that the Merlin was above.

The Approach Controller was operating at low intensity and low complexity which could suggest his arousal levels were low, potentially leading to his attention being distracted by conversation in the Approach room. This in turn led to the late identification of a conflict and the requirement of a prompt from the Supervisor to call traffic to the Merlin. The Traffic Information was passed to the Merlin at a late stage with 1nm horizontal separation; CAP 774 states controllers should pass Traffic Information on relevant traffic at 5nm, 3nm and update the traffic if it continues to constitute a definite hazard, or if requested by the pilot. The lack of Mode C would have hindered both the Approach and Zone controllers in identifying the C152 as conflicting with the Merlin. The density of GA traffic present to the east of the C152 prior to the incident would have made identification of the conflicting track difficult to both controllers.

The Zone controller did not pass Traffic Information to the C152 and, under a Basic Service, is not required to do so. The Zone controller was aware of the C152's routing and, although not required to do so, could have passed information to the C152 on the activity of the Merlin as they were responsible for deconflicting the track through the MATZ. This may have been precluded by the prioritisation of a Traffic Service to aircraft inbound to Chalgrove, which he was talking to at the time of incident. The reported altitude of the C152 at 2200ft for the MATZ stub crossing may also have led to the controller believing more than 500ft would exist between the C152 and the Merlin.

The two main barriers in this incident were lookout and Traffic Information. Both the C152 and Merlin crew were unable to acquire each other through lookout and, in this instance, the passing of Traffic Information was late so the Merlin pilot had little time to visually identify the conflicting aircraft and take action. Neither aircraft had any form of Airborne Collision Avoidance System (ACAS), which may have given the pilots added situational awareness and alerted them of the confliction earlier. A local investigation was conducted by ATC which identified that the Approach controller had become distracted by conversation within the Approach Control Room. Traffic Information was later than optimal to provide the Merlin pilot time to acquire the C152 and take avoiding action, and the contextual conditions were such that they did not assist either pilot in becoming visual.

### **UKAB Secretariat**

The Merlin and C152 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 C152 pilot was required to give way to the Merlin<sup>2</sup>.

### **Comments**

#### **JHC**

The Merlin crew were using an appropriate ATC Service and could have expected an earlier warning of the C152's presence. Additionally, it is unclear how close the 2 aircraft came vertically. Assuming they were both on the correct pressure setting, there should have been 800ft between them, and it was reported that they were much closer. Merlin TAS fitment will be completed by Sep 16 and will provide an additional barrier should this situation recur.

### **Summary**

An Airprox was reported when a Merlin and a C152 flew into proximity at 1555 on Tuesday 16<sup>th</sup> February 2016. Both pilots were operating under VFR in VMC, the Merlin pilot in receipt of a Traffic Service from Benson Approach and the C152 pilot in receipt of a Basic Service from Benson Zone.

### **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 looked at the actions of the Merlin pilot. He was conducting a compass calibration air-test that involved high cockpit-workload which limited his look-out. Some members wondered whether the Merlin pilot had chosen the best area to conduct his air test given that it was a known GA choke point. They were informed that there was another air-test operating with Benson ATC in a different area (one which was known to be less busy with GA transits), and that the two pilots had had to de-conflict their sorties, which was why the Merlin was operating where it was. Members

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

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

commended the Merlin pilot for mitigating the high cockpit-workload by using his crew to supplement his look-out and in electing to receive a Traffic Service from Benson ATC. Recognising that there were no guarantees of receiving Traffic Information on all aircraft even under a Traffic Service, the Board thought that having agreed one with RAF Benson, it not unreasonable that the Merlin pilot would normally have expected to receive warning of traffic displayed on RAF Benson's radar much earlier than he actually did. Notwithstanding the lateness of the Traffic Information from the controller, under a Traffic Service the pilot remains responsible for his own separation; some members opined that the late call from RAF Benson may have resulted in the Merlin pilot being startled to see traffic as close as it was, and that this might account for him assessing the C152 to be as close as he did, when the evidence pointed to there being in the region of 800ft separation. The Board noted that the Merlin fleet was due to be fitted with TAS in the near future and acknowledged that in this situation it may have provided the pilot with earlier information.

For his part, the Board thought that the C152 pilot had not seen the Merlin, and that the helicopter he had reported seeing was in fact one which he crossed paths with a few miles earlier. Pilot members opined that, as the pilot himself had indicated, his inability to see the Merlin was probably due to a combination of the hazy conditions and the high-wing configuration of his aircraft which would likely have obscured the Merlin. They also thought that this tended to support the reported height of the C152, because an aircraft 800ft above would have been more likely to be obscured from view than one much closer. Members also opined that, if there had only been 200ft separation (as estimated by the Merlin pilot) the C152 pilot would have been likely to have heard the Merlin as well as seen it as they passed each other. In trying to determine the actual height of the C152, the Board noted that, because he didn't have Mode C fitted to his aircraft, his height was not displayed on radar. Members debated the fact that, on being questioned by the Zone controller, he had immediately responded with 2200ft, the height at which he was cleared for his MATZ crossing; that he did so without hesitation appeared indicative of him reading his instruments rather than checking his notes to recall the clearance itself. Furthermore, the pilot had stated that he didn't have any indications throughout the rest of the flight that his altimeter may have been faulty or that he had incorrectly set the pressure setting. The outcome of the discussion was that the Board thought that on balance of probability the C152 pilot was indeed at his reported height of 2200ft.

The Board then turned to the role that ATC played in this Airprox. They noted that the Traffic Information given to the Merlin pilot was called later than would normally be expected and they wondered why this might have been so, particularly because the controller knew that the Merlin was conducting an air-test and was therefore likely relying more heavily on receiving his calls. It was apparent that the App Controller was not very busy (one aircraft on frequency), and ATC members thought that it was possible that this low-arousal led him to focus on the conversation within the ACR rather than the task in hand; indeed, it was only thanks to the Supervisor reminding him that he called Traffic Information when he did. ATC members noted that the C152 was wearing a Zone squawk, and the App Controller could have easily asked the Zone Controller for information or co-ordination if he had seen the conflict earlier. For his part, the Zone Controller was busier and, because the C152 was under only a Basic Service, he did not have the same obligation to give Traffic Information to the C152 pilot. Nevertheless, the Board wondered whether he should have passed Traffic Information to the App Controller, but thought that he had probably liaised with the App Controller for the MATZ crossing and therefore, in his mind, may have thought that this duty of care was discharged. Furthermore, he could see the Merlin indicating 800ft above the reported height of the C152, which again may have led him to believe there wouldn't be an issue.

In looking at the cause, the Board agreed that the root of the incident lay in a late sighting by the Merlin pilot and a non-sighting by the C152 pilot. However they also agreed that Benson ATC had had a part to play, and that a contributory factor was the late Traffic Information by Benson ATC. Turning to the risk, the Board thought that the balance of probability was that the separation was in the region of 800ft and that this was therefore a Category C incident with no risk of collision.

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

Cause: A late sighting by the Merlin pilot and a non-sighting by the C152 pilot.

Contributory Factor(s): Late Traffic Information from Benson ATC.

Degree of Risk: C.