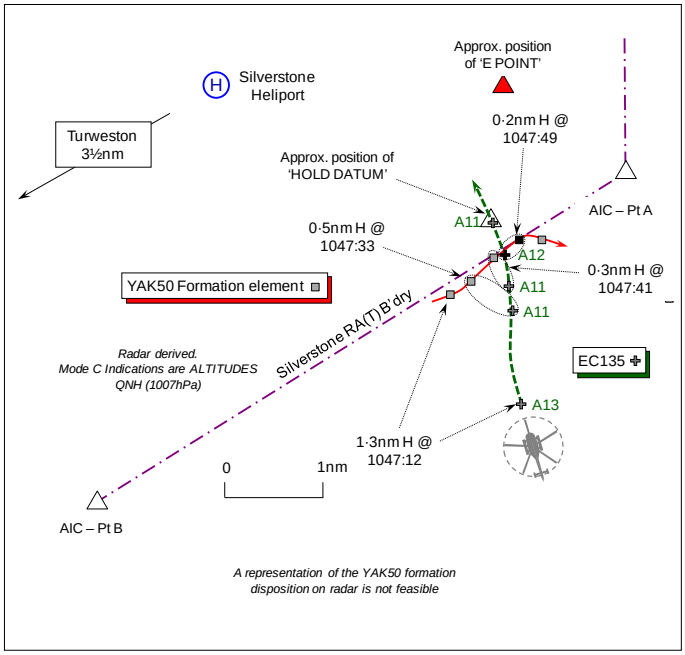
AIRPROX REPORT No 2012096

Date/Time: 7 Jul 2012 1047Z (Saturday)

Position: 5202N 00056W (3½nm SE of Silverstone Heliport – elev: 502ft)

Airspace: Silverstone RA(T) (*Class: G*)

	Reporting Ac	*Reported Ac*
Type:	EC135 T2+	YAK50 x6
Operator:	Civ Comm	Civ Pte
Alt/FL:	1500ft QNH (1007hPa)	1600-2000ft QNH
Weather:	VMC CLOC	VMC Hvy showers
Visibility:	8km	10nm (o/s showers)
Reported Separation:	Nil V/30m H	Not seen
Recorded Separation:	Not feasible	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE EUROCOPTER EC135 T2+ PILOT reports he was inbound to Silverstone, VFR and under a BS, he thought, from Silverstone CIRCUIT on 132·650MHz. A squawk of A7000 was selected with Modes C and S on; TCAS 1 is fitted.

Approaching 'East Point' [the specified joining datum for RW21] heading 350° at 130kt, level at 1500ft QNH (1007hPa), with a Restricted Area (Temporary) [RA(T)] 'join' approved, he was looking for the display team, when he spotted the formation of 6 YAK ac in his 10 o'clock – 1nm away, low, moving ahead at 500ft agl inside the RA(T). The formation leader pulled up in front of him in a rolling manoeuvre from L – R passing 200m away; ac2 and ac3 then rolled around his flight path ahead, whilst ac4 and ac5 rolled around his ac from L – R; the minimum separation was 30m against ac5 and ac6. Avoiding action was 'impossible' as he didn't know what they were going to do next; he assessed the Risk as 'high'. A TA was not enunciated by the ac's TCAS 1, which he believed was because of the speed [rate] of change. He reports that when discussed with the YAK formation leader 2hr later, none of the YAK pilots had seen his helicopter.

All the ac's lighting, including the landing lights, spot lights and HISLs were on; the helicopter has a black/silver/cream livery.

THE YAK50 PILOT reports he was leading a formation of 6 multicoloured YAK50 ac for an aerobatic display at the Silverstone motor racing circuit, scheduled to start at 1100UTC [some 12min after the Airprox occurred] and which formed part of the lunchtime entertainment for the Formula 1 Grand Prix event. They were not in receipt of an ATS; SSR Mode A/C is fitted but was selected 'off'. Mode S is not fitted.

The display team is composed of individuals and aeroplanes based at different locations, so they briefed for an airborne join-up of the 6ac at Little Horwood disused A/D [9nm SE of Silverstone circuit] at 1045UTC.

On arrival at Little Horwood, the weather was poor, with heavy showers, poor visibility and a low cloud base. Following a successful join-up of the 6ac, in order to operate in better weather conditions outside of heavy showers, they moved to the NW of Little Horwood in the direction of

Silverstone. However, the weather was such that the only feasible location for them to have a brief practice of formation loops and ¼ clover manoeuvres was some 5nm SE of Silverstone, where it was relatively clear. He led the team through two looping figures and then two combinations of a ¼ Clover L, followed by a ¼ Clover R. (A ¼ Clover equates to a loop with a ¼ roll flown in the loop resulting in a 90° heading change.) Before entering any such manoeuvre he checked for other traffic as they were operating in uncontrolled Class G airspace and it was 'see and avoid' - no traffic was seen. The practice commenced at about 1050UTC, concluded at approximately 1053UTC and was undertaken on a discreet radio frequency. Practice display heights varied from 600ft agl to 2000ft agl.

Positioning the formation into a holding pattern 3nm SE of Silverstone at 2500ft agl, he called Silverstone ATC on 121·075MHz. He established contact with Silverstone CIRCUIT and requested clearance for their display at 1100UTC; however, he was asked by ATC to 'standby' until remaining inbound traffic was on the ground.

He understands that this Airprox occurred in the vicinity of EAST POINT - the entry point into the RA(T) for RW21. He had attempted to obtain a briefing from Silverstone ATC prior to the flight and had eventually spoken by telephone to ATC. He was not informed or briefed as to the entry points for the RA(T), which were not evident from the AIC/NOTAM. As such, if he did lead the formation into the vicinity of 'EAST POINT', that was inadvertent and unintended.

At approx 1058UTC, he was cleared inbound to display in the NE corner of the cct, flew their 15min display sequence and then departed the area. After the display he landed at Wycombe Air Park and about 1hr later, in a telephone call, was informed by Silverstone ATC that an Airprox was being filed by the pilot of an inbound EC135 helicopter. Contacting the helicopter pilot by telephone to ascertain the circumstances of the Airprox, they had a positive conversation during which he apologised to the helicopter pilot for any inconvenience. As leader of the display team, he was unaware of the presence of the EC135 helicopter and not aware of any Airprox until he was advised subsequently by Silverstone ATC and the telephone discussion with the EC135 pilot. Manoeuvring a large formation is not straightforward; he thought, the general 'see and avoid' principles successfully resulted in the EC135 avoiding his formation in open airspace.

The YAK50 team display was affected by the very poor weather that day and they had an operational requirement for a brief practice before displaying at Silverstone; permission to enter the RA(T) had been issued for their display [but not beforehand for the display practice]. He apologises that the display practice brought his formation into close proximity with the EC135 and has expressed that view directly to the EC135 pilot.

THE SILVERSTONE CIRCUIT (AERODROME) CONTROLLER reports that he was acting as the Silverstone Circuit Controller when the EC135 pilot advised him that he wished to file a report about the YAK50 aerobatic team who were practising their display in the vicinity of East Point. The EC135 pilot stated that the formation was operating above 500ft and he considered it an unsafe situation. At the time, the YAK50 aerobatic team were not on any Silverstone frequency but were scheduled to commence their display at 1100UTC.

THE SILVERSTONE ATC MANAGER reports that prior to the Airprox a controller had briefed the YAK50 aerobatic team leader about the contact frequency, that they should remain clear of their 'larger than normal airspace' until the RA(T) was clear of other traffic and then the YAK50 aerobatic team would be cleared to commence their display. The Controller reported that the EC135 pilot had reported an Airprox with the 6ac YAK50 formation at East Point.

ATSI reports that the Airprox was reported to have occurred in the RA(T) established in Class G airspace for the Silverstone Grand Prix between an EC135 helicopter and a formation of 6 YAK50 ac. The RA(T) was notified by NOTAM and Aeronautical Information Circular (AIC - M034/2012) as being active between 0700 and 1800 on the 7th July 2012 from the surface up to 2500ft amsl and is illustrated at Figure 1. According to the AIC no aircraft were to fly in the RA(T) established for Silverstone unless the pilot informed the ATSU immediately before entering the area of the ac's

position, level and track, flew in accordance with ATC instructions and maintained a continuous listening watch on 121.075MHz.

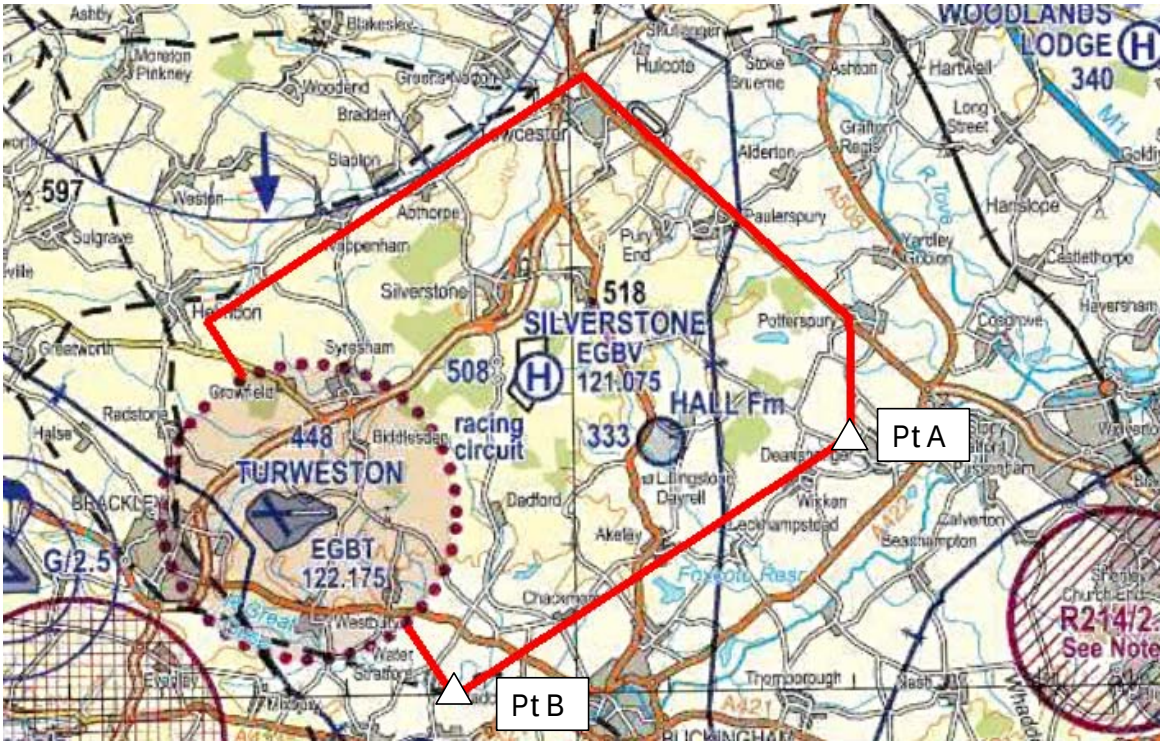


Figure 1

The EC135 was operating on a VFR flight from Marlow to Silverstone and was in receipt of an Aerodrome Control Service from Silverstone Circuit on 132.650MHz.

The formation of YAK50s was operating on a VFR flight prior to performing an aerobatic display at the Silverstone Motor Circuit, which was scheduled to commence at 1100UTC. They had departed from several different airfields and had briefed for an airborne join-up in the vicinity of Little Horwood disused A/D. They were not in communication with Silverstone. The Silverstone Circuit controller was providing an Aerodrome Control Service without the aid of surveillance equipment.

The Cranfield METARs are:

1050Z: 19009KT 130V200 9999 –SHRA FEW009 SCT020CB 17/13 Q1007=
1150Z: 11008KT 9999 VCSH FEW010 FEW020CB 18/15 Q1007=

According to the written report from the Silverstone ATC manager, prior to the Airprox the lead pilot of the YAK50 formation had received a briefing to remain clear of Silverstone's airspace until the airspace was clear of other traffic and the YAK50 formation was cleared to display.

At 1040:22, the radar recording indicates a group of primary returns 7.9nm to the SE of Silverstone, in the vicinity of Little Horwood. The group of primary returns slowly manoeuvred to the NW until at 1046:01, they were 3.1nm to the SE of Silverstone while the EC135 was 7nm SSE of Silverstone, tracking N.

At 1046:29, the group of primary returns were inside the RA(T), manoeuvring near the boundary.

[UKAB Note (1): Analysis of the Clee Hill radar recording shows a sequence of single primary returns that in all probability is an element of the YAK50 formation (no other primary returns are shown that might be the formation ac), positioned to the S of the plotted Silverstone RA(T) boundary line between Pts A – B, tracking broadly NE'ly. (The plotted boundary line co-ordinates have been

corrected for the correspondence error between the OSGB36 and WGS84 datums.) It is not feasible to identify if this single primary return is the entire formation or an individual element; at 1047:12 it is in the EC135's 11:30 position at a range of 1·3nm. The EC135 shows a track alteration R and then L (which might be the result of track jitter) before closing to a range of 0·5nm from the YAK50 element at 1047:33, which is still S of the RA(T) boundary. The next sweep shows the YAK50 element has closed to a range of 0·3nm, in the EC135 pilot's 11:30 position, the latter maintaining 1100ft QNH (1007hPa). The YAK50 formation element crosses ahead of the EC135 from L – R, in between sweeps and at 1047:49, is shown in the EC135's 2 o'clock at the minimum recorded horizontal separation of 0·2nm right on the plotted RA(T) boundary, as the helicopter indicates 1200ft ALT, moments before entering the RA(T). It is not possible to determine the minimum separation between the EC135 and the individual formation elements.]

Figure 2 shows the position of the primary returns relative to the southern boundary of the Silverstone RA(T) (in red) at the times indicated.

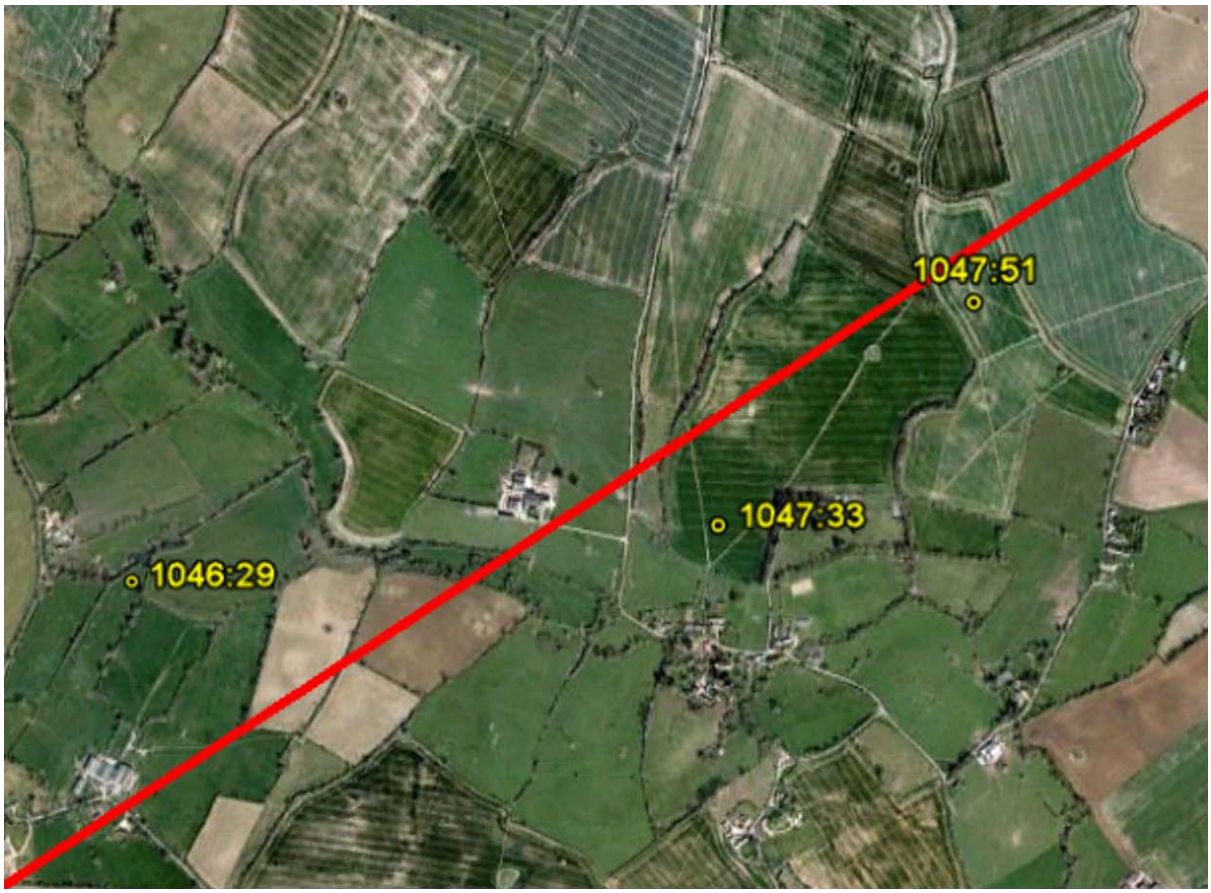


Figure 2

The written report from the EC135 pilot states that he saw the YAK50 formation inside the RA(T) at 500ft agl. The leader pulled up in front of the EC135 in a rolling manoeuvre, ac 2 and 3 rolled around the flight path of the EC135 and ac 4 and 5 rolled around the EC135. The pilot was unable to take avoiding action due to the unpredictability of the YAK50s flight.

The written report from the leader of the YAK50 formation stated that the weather was poor in the vicinity of Little Horwood so the formation manoeuvred to the NW in order to perform a brief practice of formation loops and quarter clovers in better weather conditions. The formation operated approximately 5nm to the SE of Silverstone between 600ft and 2000ft agl on a discrete frequency. The lead pilot of the YAK50 formation was not aware of the presence of the EC135 until informed by Silverstone ATC by telephone after the incident.

The written report from the Silverstone Circuit controller states that the pilot of the EC135 informed him that he wished to file a report on the YAK50 formation, but that the formation were not, at that time, on the Silverstone frequency.

Analysis

It is difficult to assess the exact position of the YAK50 formation at the time of the Airprox due to the manoeuvres undertaken and the erratic display of the primary returns. Prior to the Airprox the primary returns appear to have been inside the RA(T) without permission from Silverstone; however, at the time of the Airprox, the primary returns appear to have been [on or] just S of the boundary of the RA(T). In uncontrolled Class G airspace, the principles of see and avoid apply and pilots are ultimately responsible for their own collision avoidance.

The YAK50 formation were not in contact with the Silverstone CIRCUIT controller at the time of the Airprox; therefore, the Silverstone CIRCUIT controller was unaware of the potential for a confliction and unable to pass information to the EC135 pilot regarding the position, level or track of the YAK50 formation.

Conclusions

The Airprox occurred in the vicinity of the Silverstone RA(T) boundary at 1047:41, when a conflict arose between the EC135 and a formation of YAK50s, which was practising manoeuvres prior to a display at Silverstone and were not in contact with ATC.

As all the ac involved were in Class G airspace, the respective pilots were ultimately responsible for collision avoidance. The Silverstone CIRCUIT controller was unable to provide assistance in order to prevent the Airprox.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, radar video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

The RA(T) for Silverstone, promulgated by AIC and NOTAM, was established to afford increased protection for the extensive passenger-carrying helicopter traffic and unusual aviation activity supporting this event including, ironically, the YAK50 formation display. The promulgated restrictions to allow entry into the RA(T) required pilots to maintain a continuous listening watch on the notified Silverstone frequency, to inform ATC immediately before entering the area of their ac's position, level and track and to fly in accordance with the instructions issued by Silverstone ATC - broadly similar to that for flight in an ATZ provisioned with ATC. Helicopter pilot Members familiar with the event stressed that this is very busy airspace during the period and the helicopter procedures specify visual entry points and holds to enable ATC to cope with the high levels of VFR traffic encountered. The ATC Manager's report explained that the YAK formation leader had also been given a brief by ATC beforehand, but the exact content of that brief could not be established independently because of a fault with the ATC landline recorders at the time; an unsatisfactory state of affairs and contrary to the licence issued by the CAA for the event the Board's ATSI Advisor explained. The YAK50 pilot reports that he was not informed of the entry points for the RA(T), which were not evident from the NOTAM. Helicopter pilot Members were concerned that some of the detail, such as routeings and entry/holding points etc, was not included in the AIC. This suggested to Members that if the AIC had included more comprehensive information it might have alerted the formation leader to the increased potential for encountering helicopter traffic in the vicinity of the Airprox location. The Board concluded that added detail, indicating where the event traffic might be concentrated, could be helpful to other non-participating aviators who might be planning to fly in the vicinity, but outside the RA(T). It was agreed, therefore, that a Safety Recommendation was warranted: the Silverstone operator is recommended to review the content of the AIC, in concert with CAA AUS, to provide

additional guidance to pilots flying in the vicinity of the RA(T) and to review the briefing requirements for display crews.

Plainly the EC135 pilot was in two-way RT and had obtained his joining instructions from Silverstone whilst inbound to the RA(T), whereas the YAK50 formation were conducting their formation practice autonomously and not in communication with Silverstone ATC at this point. Although the EC135 pilot reports he was looking for the display team, the ATSI report reveals he had not been passed any TI by the Silverstone controller who was unaware that the YAK50 formation leader was conducting his display practice adjacent to the boundary to the RA(T) and at one point actually inside the RA(T) the radar recording reveals. The Board accepted that this was an inadvertent and unintended infringement of the RA(T), but if the YAK50 formation leader had realised where he was and had been in contact with Silverstone, advising them what he was doing, the controller would have been able to pass a comprehensive warning to the EC135 pilot and other inbound pilots.

The EC135 pilot had seen the YAK50 formation from a range of 1nm and identified that it was crossing ahead from L- R. Members considered that this was a reasonable sighting range but evidently the formation manoeuvre took the EC135 pilot by surprise and he was unable to avoid the 6 YAK50s as they performed their combination of aerobatic manoeuvres around his helicopter; pilot Members agreed that it would have been impossible to anticipate the flight path of the 6 YAK50 aeroplanes beforehand.

A GA pilot Member was concerned that although this was a pre-planned practice in Class G airspace by the display team, no notification had been given at all to other aviators or to Silverstone ATC that they would conduct their practice there, which in the Member's view was most unwise. The YAK50 pilot reports that having initially planned his formation join-up at Little Horwood they found the weather unsuitable for the display practice. This had evidently forced him to move his formation closer to Silverstone where it was relatively clear he reports, before he commenced his practice routine involving formation loops and ¼ clover manoeuvres some 5nm SE of Silverstone. However, it was evident he had been closer to the RA(T) than the leader had realised and he had flown into the RA(T) whilst executing his practice just before the Airprox, which occurred on the boundary of the Silverstone RA(T). The YAK50 formation leader was responsible for clearing the airspace in which he intended to manoeuvre his formation; however, it was evident from the leader's candid account that he had not seen the EC135 helicopter at all, either before he initiated the display sequence or during the manoeuvre itself and he was thus unaware of the danger posed by the helicopter approaching from the S. Although lookout was the formation leader's prime responsibility, Members were equally concerned that none of the other five YAK50 pilots were aware of the helicopter. The Board agreed, unanimously, that this Airprox was the result of a non-sighting by the YAK50 formation on the boundary of the Silverstone RA(T).

Although the six YAK50 ac comprising the formation were not shown individually on the radar data, the recording showed at least one element crossing ahead of the EC135, but it is not possible to determine independently the minimum separation between the EC135 and the individual formation elements. Nevertheless there was no reason to doubt the veracity of the minimum separation reported by the EC135 pilot, who was the only one cognisant of the danger posed by the six YAK50 ac, but who was unable to take any effective avoiding action as the formation ac manoeuvred around his helicopter. With the formation pilots themselves unaware of the EC135 helicopter at close quarters during their high-energy aerobatics, the Board agreed that an actual Risk of collision had existed in the circumstances conscientiously reported here.

The Board recognised the difficulty of gathering six individual YAK50 pilots together to practise their routine and clearly this was an essential element in ensuring the safe execution of the formation display. However, an experienced pilot Member – himself a former display pilot – was concerned that the formation leader had found himself cornered into a difficult situation when confronted with poor weather. Moreover, the formation leader should have been aware that he was in close proximity to the RA(T) and the potential for concentration of event traffic here or other non-participating traffic skirting the Area. The display practice was itself an unusual activity and it had already been mentioned that it would have been helpful to advise others of the formations intentions.

Pilot Members were concerned that planning and supervision might have been factors here and suggested that a review of the display team's procedures would be appropriate. After weighing all these factors carefully the Board concurred and a second Safety Recommendation was agreed that: the YAK50 formation display team is recommended to review its operating procedures.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the YAK50 formation on the boundary of the Silverstone RA(T).

Degree of Risk: A.

Recommendation: 1. The Silverstone operator is recommended to review the AIC, in concert with CAA AUS, to provide additional guidance to pilots flying in the vicinity of the RA(T) and to review the briefing requirements for display crews.

2. The YAK50 formation display team is recommended to review its operating procedures.