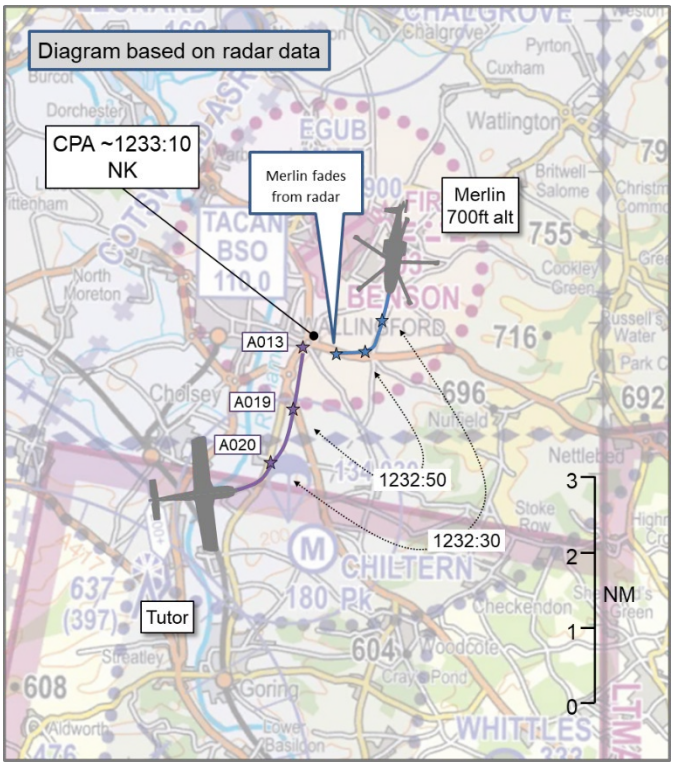
AIRPROX REPORT No 2022207

Date: 01 Sep 2022 Time: 1233Z Position: 5135N 00106W Location: Benson

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Merlin	Tutor
Operator	RN	HQ Air (Trg)
Airspace	Benson ATZ	Benson ATZ
Class	G	G
Rules	VFR	VFR
Service	ACS	ACS
Provider	Benson	Benson
Altitude/FL	NK	NK
Transponder	A, C, S	A, C, S
Reported		
Colours	Grey	White, Blue
Lighting	NR	Strobes, Nav, Landing
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	500ft	NR
Altimeter	QFE	QFE (1013hPa)
Heading	NK	NR
Speed	70kt	140kts
ACAS/TAS	TAS	TAS
Alert	None	Information
Separation at CPA		
Reported	1-200ft V/2-300m H	300ft V/500m H
Recorded	NK	



THE MERLIN PILOT reports that they were conducting underslung load circuits to the Northern Load Park at RAF Benson. They called turning finals for the Northern Load Park, requesting cross/re-cross RW01 – as they had done for the previous two circuits with no issue – to which the Tower controller replied, '[C/S], clear land Northern Load Park, cross re-cross RW01 as required, confirm gear down', to which they responded in the affirmative and acknowledged. As they were about to cross the runway centreline at 500ft QFE, a Grob Tutor was seen on the left, appearing slightly above, joining deadside. The crew felt this was uncomfortably close, and the crew were not aware that it was joining. The aircraft captain mentioned its close proximity to the Tower controller, to which the controller replied that it was well above. This was not the perception of the Merlin crew. Of note, the Merlin's radios had been difficult during the period operating at RAF Benson, with difficulty having been experienced in hearing transmissions between Tower and other aircraft and, on occasion (whilst on the ground or in the low hover), directly with Tower; whilst airborne transmissions directly between the Merlin and Tower were loud and clear.

The pilot perceived the severity of the incident as 'Medium'.

THE TUTOR PILOT reports that as they recovered to Benson RW01 at the end of their first cadet flight of the day, they made routine position calls to Benson Tower. They were aware that a Merlin was operating in the Load Park as they had seen it on departure twenty minutes prior; they were made aware of its position by ATC on joining and visually acquired it very soon after. Thanks to timely calls from ATC and very good visibility on the day, their SA on the Merlin was excellent throughout. They knew that a low break would be prohibited due to the Merlin, so elected to join via a break at circuit height. While conducting this they passed the Merlin level, 300ft above, at approximately 140KIAS. The Merlin was on the runway and they were on the deadside. This is the typical separation when joining a military airfield. Of note, RAF Benson local orders mandate an additional call of 'deadside' when multiple

aircraft are in the circuit to aid SA – they made this call as stipulated. Once they were sure of separation with the Merlin, they broke ahead of them to fit into the circuit, cognisant that they could not overly delay the break due to a Puma departing from Point West. They landed without incident. At the time of the reported Airprox all external lights were switched on in accordance with Tutor SOPs. They did not recall a TAS contact specifically, but were of the opinion that there would have been at least one due to the Tutor on the ground and the Puma departing. This is again routine when recovering to an airfield. It was a few weeks later that they were informed this was reported as an Airprox by the Merlin crew, and an additional week until it was established that it was their aircraft they were reporting against. ATC tapes and ADS-B historical trace have been used to refresh their memory of the event.

The pilot perceived the severity of the incident as 'Low'.

THE BENSON TOWER CONTROLLER reports they were the Tower controller for this period of time and spoke with the Merlin pilot at length after they had completed their sortie later that evening. From [the controller's] perspective, the workload was at a medium intensity, with the Tower and Ground positions band-boxed. Tutor flying for the day was steady, with an average of 2 Tutors on frequency at any one time. As the Merlin joined the circuit from radar, they asked if the pilot was familiar with Benson, which they confirmed that they were. When the Merlin pilot was ready for their first RW01 Load Park circuit, they requested take-off with an underslung load, and the circuit profile began in the normal fashion. Upon turning onto finals, the pilot requested a 'cross-recross' of the active runway for the approach into the Load Park, which made sense, given the wind direction. The controller confirmed that 'cross-recross approved if required'. The profile that the Merlin took, however, was significantly further west (offset) of the runway than they expected, overflying the point at which cars would wait at the red traffic lights (positioned either side of the runway). Fortunately, there were no cars waiting at the time and they switched a second set of traffic lights (which are placed further back from the runway) to red in order to stop any further traffic from driving up to the normal waiting point.

After this first circuit, they planned to radio the Merlin pilot and ask them to stay closer to the runway if performing a cross-recross, as they would likely overfly waiting cars on the airfield on the profile they had just flown. The comms issues cited in the pilot's narrative prevented the controller from passing this message, as they could not get a response from the Merlin pilot whilst they were on the ground. They planned to pass this message when the Merlin was on the downwind leg of the next circuit as they wanted to minimise input on the take-off and landing phases of the circuits. During the next circuit they were unable to pass this information over to the Merlin due to work on other frequencies. They sanitised the runway well in advance of the Merlin's finals call in order to ensure they had no vehicles waiting at the normal crossing point which could potentially be overflown. A cross-recross was requested and they once again responded with a 'cross-recross approved if required'. Speaking with the pilot that evening, they did mention that at any point if a cross-recross wasn't practical, then the controller could have declined and the pilot would fly the normal Load Park circuit profile in accordance with the DAM.[1] Although this perspective is understandable, from a Tower controller's point of view, a cross-recross (especially a very wide one) is never convenient, and they facilitated it only because they believed that it was what the pilot needed in order to complete the circuit. After the second circuit, the controller tried once again to radio to the pilot, however could get no response. They also needed to communicate to the Merlin pilot at this point that the disused runway (06/24) could not be used as a land-on area as they had set down there. The controller spoke with the Supervisor who suggested radioing the personnel in the Load Park in order to relay this message to the Merlin captain. They believed this message made it to the pilot, as the Merlin shortly repositioned from the disused runway onto the grass.

The Merlin then was ready for their third Load Park circuit, at this time a Tutor called for 're-join via initials' on the shared Tower frequency and they gave approval, along with the RW in use, QFE and circuit state. During the third and final circuit for the Merlin, the controller was once again busy with tasks whilst the Merlin pilot was on the downwind leg. Whilst the Merlin was late downwind, the Tutor called 'Initials' (after speaking with the Merlin pilot on the phone, they believed that neither of the Initials calls that were made by the joining Tutor pilot were heard on their comms which could well have been

[1] Defence Aerodrome Manual.

part of the radio issues they were having). Once again when the Merlin pilot asked for clearance to land in the Load Park with a cross-recross, they approved the landing with a cross-recross if required. From their position in the Tower, they could see both the Merlin and the joining Tutor with their profiles looking significantly spaced from their perspective (the Tutor being higher and further to the right as observed with them both flying toward the Tower). The Merlin pilot then mentioned on frequency that a Grob had just flown above them, and to their left-hand side, at which point they [the controller] assured them that it would have been visual with them whilst descending into the circuit. They were confident that the Tutor pilot was visual with the Merlin as they descended from Initials Point (2000ft) down into the fixed-wing circuit (800ft), as they had been given the correct circuit information at the required points and hadn't needed to ask for any updates. In addition to this, it is worth noting that the underslung load circuit height at Benson is 500ft, which is 300ft below the fixed-wing circuit height. They noted however, that they completely understood that if the 'Joining via Initials' and 'Initials' calls made by the Tutor pilot were missed due to bad radios, then seeing the Tutor late as it passed them would have been worrying. This potentially felt like a Hazard Observation scenario from an ATC perspective, rather than Airprox.

THE BENSON SUPERVISOR reports they were not made aware of an Airprox at any point during this shift as Supervisor. However, the ADC controller did request their assistance during the [Merlin C/S] Load Park sortie due to poor comms and a lack of familiarity with Benson operations shown by the crew. The crew had declared familiar with Benson on recovery with Approach. The BINA[2] and Benson DAM Annex O-5 section 4 state that no air systems are to land on the disused runway due to the unstable surface and lack of PCN[3] with the exception of the two concrete pads. However, [Merlin C/S] was setting down on the non-approved surface. They instructed the ADC controller to pass the message on frequency, however no response was received. Using MRE,[4] the message was passed via the groundcrew and the situation rectified for further circuits. They were also made aware that the profile being flown for the Load Park circuit was non-compliant with Benson DAM Annex O-5 section 2 and Appendix 1 to O-5, with their track taking them over the western side (deadside) of the aerodrome which overflew vehicle traffic holding at the Zulu intersection. As the ADC controller was working at a high capacity and in conjunction with the comms issues with the Merlin, the reminder they requested to be passed to the pilot on frequency was not sent. To mitigate, the ADC controller applied due diligence and set the RW06 threshold lights to red to increase safety to vehicle users on the airfield. Having being made aware of the Airprox, they believed the intermittent comms and incorrect profile of the Load Park circuits placed the two air systems in a similar lateral area, however the vertical run-and-break profile of the Tutor does not conflict with the Merlin in the Load Park circuit which is not above 500ft QFE.

Factual Background

The weather at Benson was recorded as follows:

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METAR EGUB 011150Z 08008KT CAVOK 22/13 Q1019 NOSIG RMK BLU BLU=
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Analysis and Investigation

Military ATM

An Airprox occurred on 1 Sept 22 at approximately 1330 UTC, in the Benson visual circuit between a visiting Merlin and a Grob Tutor. Both aircraft were under the control of the Benson Aerodrome controller.

The Benson Supervisor was positioned within the Visual Control Room assisting the Tower controller with the Merlin operations, due to their continuing frequency issues as well as perceived lack of familiarity with Benson standard operating procedures. The Supervisor was not made aware of the Airprox at the time, highlighting that vertical separation of 300ft between a helicopter

[2] British Isles and North Atlantic – a miliary En-Route Supplement detailing airfield information within the area of coverage of the document
[3] Pavement Classification Number
[4] Management Radio Equipment

conducting underslung loads and a light fixed-wing aircraft joining via Initials is standard operating procedures.

The Benson Tower controller, operating band-boxed with Tower and Ground frequencies, had a mixture of aircraft consisting of two helicopters and two Tutors. The visiting Merlin was conducting underslung loads not above 500ft on Benson QFE, with requirements to cross and re-cross the runway during their sortie. At the time of the Airprox only the Merlin and Tutor were in the visual circuit.

Figure 1 shows the position of the Merlin and the Tutor at radar CPA. The screenshot was taken from a replay using the NATS radars which are not utilised by the Benson controllers, therefore may not be entirely representative of the picture available.

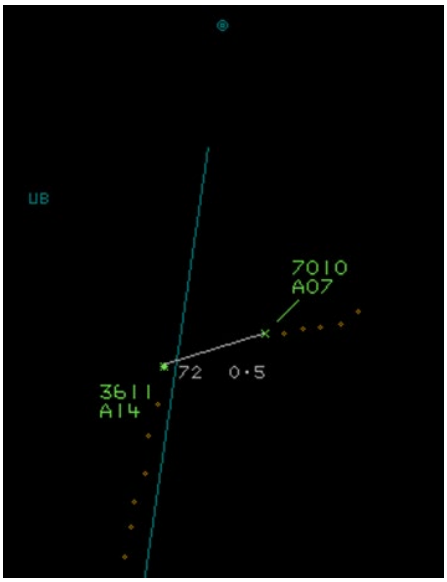

Figure 1: 12:33:06 CPA.

Figure 1 shows radar CPA measured at 0.5NM and 700ft, the next radar sweep loses radar contact on the Merlin (squawking 7010).

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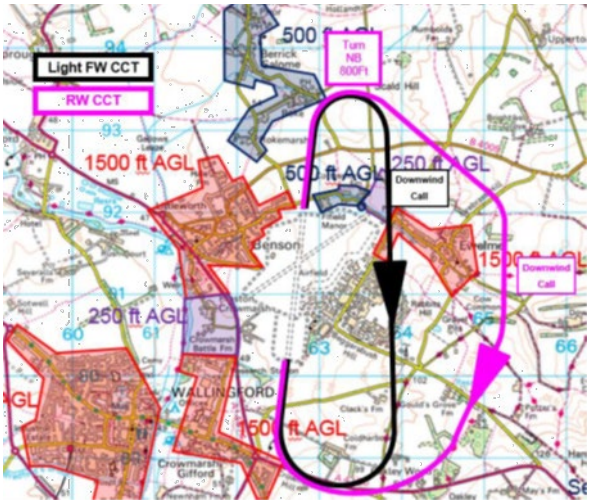


Figure 2: RAF Benson Visual Circuit profile RW01RH and Local Avoids.

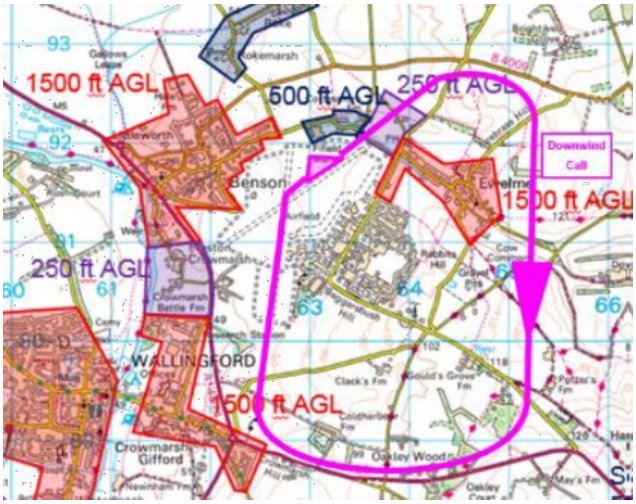


Figure 3: RAF Benson Load Park Circuit profile RW01RH.

ANALYSIS

Following review of RAF Benson's Defence Aerodrome Manual both the Merlin and Tutor were operating in accordance with the policy at the time of Airprox. Figure 3[5] above represents the profile expected of a helicopter conducting an underslung load circuit, however, as stated in the Defence Aerodrome Manual these are notional circuits and may be amended to suit wind conditions.

As the Tutor joined via Initials, the Tower controller stated the number of aircraft in the visual circuit, however did not provide the location of these aircraft in accordance with the Controller Order Book. However, the Tutor pilot reported that they were aware of a helicopter conducting underslung loads prior to joining the visual circuit.

The Merlin pilot reported that transmissions directly between themselves and the Tower controller were loud and clear, however, they struggled to hear other transmissions made, therefore would have had little situational awareness on other visual circuit traffic.

UKAB Secretariat

The Merlin and Tutor pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.[6] 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.[7]

Comments

HQ Air Command

On review of this incident, RAF Benson was content that the standard operating procedures in place for this scenario are appropriate and safe, and the Tutor pilot joined the circuit in line with guidance given in the Benson DAM. Radio issues precluded the Merlin crew hearing the joining calls and it is understandable that they were startled by the Tutor when they saw it. With the Tutor's SA on the Merlin excellent throughout, the risk of collision was low.

JHC

Although the Merlin crew responded that they were familiar with RAF Benson procedures, it appears that a few discrepancies were reported by ATC. The joining Tutor was descending from 2000ft QFE to not below 800ft, meanwhile the Merlin should have been not above 500ft. The SOPs are established to keep all circuit users safe. The situation was exacerbated by poor comms from the Merlin which may have led to the missed joining calls from the Tutor. With SA downgraded, conducting underslung load as a visiting aircraft, it is understandable the Merlin crew was caught off-guard by the joining Tutor. Risk of collision is low.

Summary

An Airprox was reported when a Merlin and a Tutor flew into proximity in the Benson visual circuit at 1233Z on Thursday 1st September 2022. Both pilots were operating under VFR in VMC, and both were in receipt of an ACS from Benson ATC.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, radar photographs/video recordings, reports from the air traffic controllers involved and reports from the appropriate operating authorities. Relevant

[5] Figures 2 & 3 are extracted from RAF Benson's Defence Aerodrome Manual.
[6] MAA RA 2307 paragraphs 1 and 2.
[7] MAA RA 2307 paragraph 17.

contributory factors mentioned during the Board's discussions are highlighted within the text in bold, with the numbers referring to the Contributory Factors table displayed in Part C.

The Board discussed the event and agreed that the actions taken by both pilots, together with the separation between the two aircraft, had been sufficient to ensure that there had been no risk of collision. Members noted that the Merlin crew had been having difficulty hearing other aircraft on the frequency and wondered whether it would have been wiser to curtail the sortie. Notwithstanding not being able to hear other aircraft on the frequency, the pilot had reported that they could hear ATC and so members thought that the pilot should have been able to hear the Tower controller issuing joining instructions to the Tutor pilot. That being said, the position of the Tutor had clearly been a surprise to the Merlin crew and, having not expected it to overfly their aircraft, they had been concerned by its proximity. The Tutor pilot reported being fully aware of the Merlin and joining in accordance with Benson circuit procedures and ATC had also not been concerned by the proximity of the two aircraft given that there had been a vertical separation of 300ft. Members were therefore satisfied that normal safety standards and parameters had pertained and, as such, assigned a Risk Category E.

Members agreed on the following contributory factors:

CF1. Given the radio issues, the Merlin crew could have curtailed their sortie.

CF2. Due to operating without a fully operational radio, the Merlin pilot had not expected the Tutor to overfly the helicopter.

CF3. The Tutor pilot received information on the Merlin from their TAS.

CF4. Although it would have been expected that the Merlin crew would have received information on the Tutor from their TAS, none was reported.

CF5. The Merlin crew did not see the Tutor until it passed overhead.

CF6. The Merlin crew was concerned by the proximity of the Tutor.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2022207			
CF	**Factor**	**Description**	**ECCAIRS Amplification**	**UKAB Amplification**
	Flight Elements			
	• Tactical Planning and Execution			
1	Human Factors	• Insufficient Decision/Plan	Events involving flight crew not making a sufficiently detailed decision or plan to meet the needs of the situation	Inadequate plan adaption
	• Situational Awareness of the Conflicting Aircraft and Action			
2	Contextual	• Situational Awareness and Sensory Events	Events involving a flight crew's awareness and perception of situations	Pilot had no, late, inaccurate or only generic, Situational Awareness
	• Electronic Warning System Operation and Compliance			
3	Contextual	• Other warning system operation	An event involving a genuine warning from an airborne system other than TCAS.	
4	Human Factors	• Response to Warning System	An event involving the incorrect response of flight crew following the operation of an aircraft warning system	CWS misinterpreted, not optimally actioned or CWS alert expected but none reported
	• See and Avoid			
5	Human Factors	• Identification/ Recognition	Events involving flight crew not fully identifying or recognising the reality of a situation	Late sighting by one or both pilots

6	Human Factors	• Perception of Visual Information	Events involving flight crew incorrectly perceiving a situation visually and then taking the wrong course of action or path of movement	Pilot was concerned by the proximity of the other aircraft

Degree of Risk: E

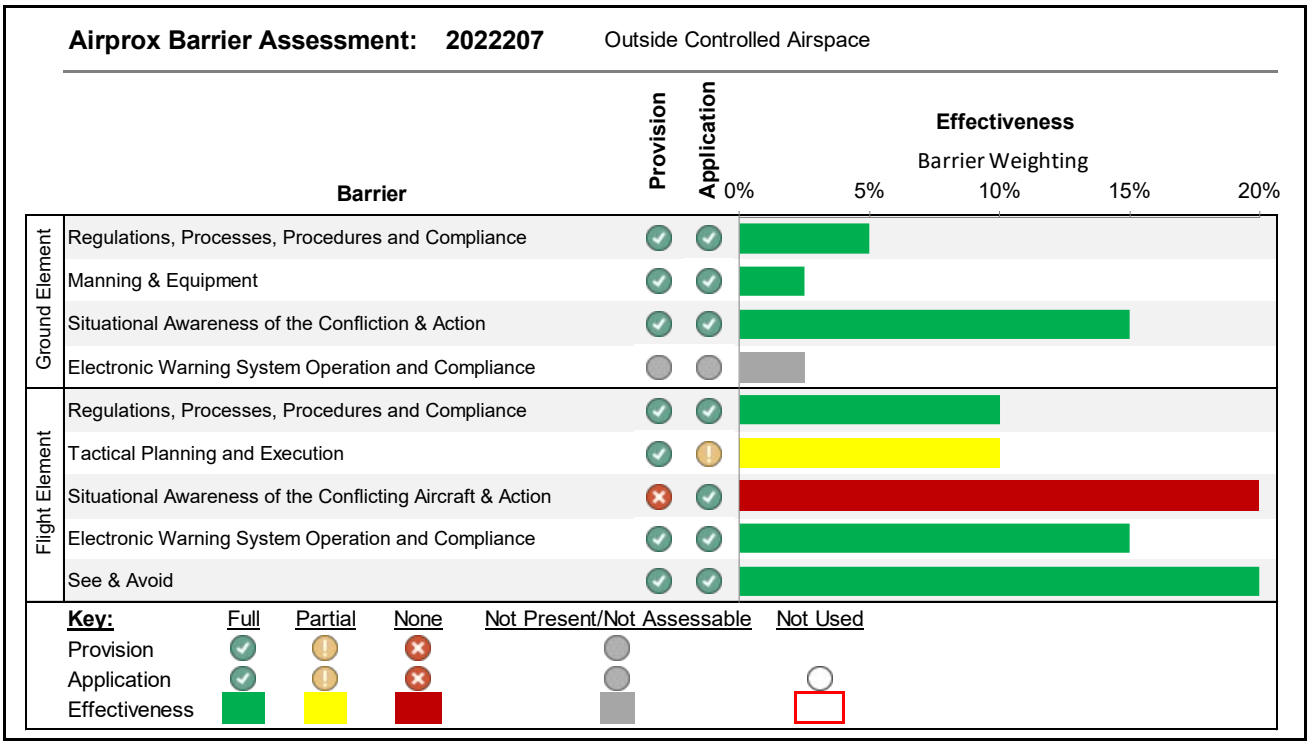
Safety Barrier Assessment[8]

In assessing the effectiveness of the safety barriers associated with this incident, the Board concluded that the key factors had been that:

Flight Elements:

Tactical Planning and Execution was assessed as **partially effective** because the Merlin crew did not adapt their plans to take into account the poor radio performance.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because the Merlin crew was not aware that the Tutor was joining through Initials.



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