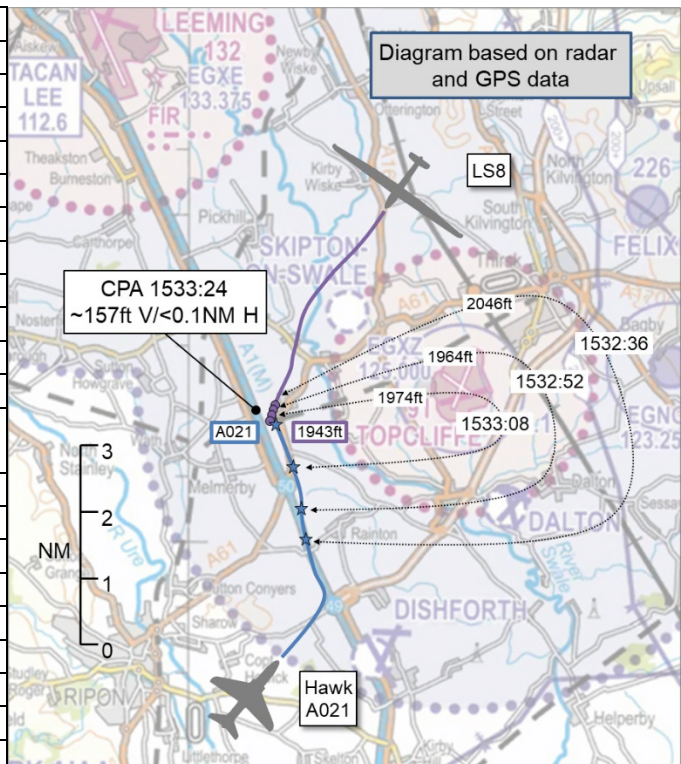


AIRPROX REPORT No 2023024

Date: 23 Feb 2023 Time: 1533Z Position: 5411N 00128W Location: 3NM W Topcliffe

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Hawk	LS8
Operator	Foreign Mil	Civ Gl'd
Airspace	Leeming CMATZ	Leeming CMATZ
Class	G	G
Rules	VFR	VFR
Service	Traffic	None
Provider	Leeming Radar	N/A
Altitude/FL	2100ft	1943ft
Transponder	A, C, S	Not fitted
Reported		
Colours	Black	White
Lighting	White Strobes, Nav lights	None
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	2000ft	1800ft
Altimeter	QFE (1015hPa)	QNH (NK hPa)
Heading	335°	200°
Speed	165kt	55kt
ACAS/TAS	Unknown	FLARM
Alert	TA ¹	None
Separation at CPA		
Reported	"400ft"	0ft V/75m H
Recorded	~157ft V/<0.1NM H	



THE HAWK PILOT reports that, on recovery from a training sortie, [they] were conducting SRA approaches for RAF Leeming ATC training. Once configured at 7NM on the extended centreline at 2000ft QFE, ATC called pop-up traffic 1NM directly in front of the aircraft with immediate avoiding action to turn left onto 270°. As the turn was entered, a glider was picked-up visually, slightly right of the aircraft and slightly low of the aircraft nose. To maintain visual, and increase the 'miss' distance, a climbing right-hand turn over the top of the glider was initiated. The glider passed down the right-hand side of the aircraft with an assessed separation of 400ft.

The timely call from ATC on a radar return had focused their attention in the area and enabled a pick-up of the glider and an increase in separation to be achieved. An excellent input from ATC. On landing, in discussion with the ATC Supervisor, the glider had been identified and efforts were underway to speak to the glider pilot directly.

The pilot assessed the risk of collision as 'High'.

THE LS8 PILOT reports that they were flying a cross-country task from [departure airfield] to [destination airfield]. They were heading from their last climb at Northallerton to the next turn at Harrogate. They observed an aircraft (unidentified at the time) coming towards them and immediately rolled their wings twice in each direction to alert the aircraft of their presence and made a small deviation to the left. The other aircraft responded about 1 second later with a brief wing-roll, once in each direction. The other aircraft passed to their right at the same level with between 75 and 100m separation. Their

¹ The Hawk pilot reported that they had received a TAS Traffic Alert although post-flight analysis has suggested that an alert may not have been received.

visibility was somewhat degraded due to the position of the sun. Their flight then continued normally, requiring a self-sustainer start to [reach their destination airfield].

The pilot assessed the risk of collision as 'High'.

THE LEEMING TALKDOWN CONTROLLER reports that they were the Director, screening a trainee at the time of the incident. RW34RH was in use in good weather conditions. They had one aircraft on frequency, [Hawk callsign], in the Radar Training Circuit, performing multiple approaches for a SRA examination being conducted in the SRE seat next to them. [The pilot of the Hawk] was under a Traffic Service (TS). An uneventful pattern was executed with the base-leg turn at approximately 10NM at 2000ft. As the trainee turned [the pilot of the Hawk] towards the centreline, [the Director] pointed out a slow-moving faint contact approaching the extended centreline from the east, between 5-6NM tracking southwest. The trainee called the conflicting traffic to [the pilot of the Hawk] correctly at a distance of 5NM with the pilot acknowledging the call.

At this point, the SRA controller called contact with [the pilot of the Hawk] and issued their frequency. [The pilot of the Hawk] was then transferred to SRA. The Supervisor was standing behind the 4 ATCOs looking at their phone, having brought up the FlightRadar app then stating that the faint contact was displaying on that system, indicating 2000ft. [The Director] immediately turned to the SRA controller and told them to turn [the pilot of the Hawk] away. The SRA screen instructed the trainee to issue an avoiding action turn which was correctly given with additional Traffic Information. The pilot read back the turn and subsequently stated that they were visual with the conflicting traffic adding that they were climbing. Once clear of the traffic, [the pilot of the Hawk] stated that they had resumed the initial radar heading and were back at 2000ft, and told the SRA controller that it was a 'great call'. [The pilot of the Hawk] was then instructed to fly through the deadside (as the Radar approach could not be continued at that range) and call Leeming Tower.

[The pilot of the Hawk] came back out into the Radar Training Circuit where the pilot re-iterated the good call by the controller. [The Director] issued turns to avoid what was becoming a congested piece of airspace due to multiple primary-only contacts. [The pilot of the Hawk] elected to land from the next approach which occurred without further incident.

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

THE LEEMING ATC SUPERVISOR reports that they witnessed the entire scenario. The ACR was very busy with lots of training being conducted in each control position. Their Supervisor console was being used for the purpose of conducting the SRA approach and, as such, they were unable to fully manage the situation due to the lack of comms, having no console to monitor the traffic situation and had no laptop available (a method through which they were authorised to use [particular EC equipment] to monitor glider activity from the local glider sites). As [the pilot of the Hawk] was being vectored onto final approach, [the Supervisor] saw the non-squawking contact converging toward the approach lane. They saw and heard the Trainer call the contact but, aware that there was no height information, they used the only means by which they could get additional information, and increase the SA of both controllers and pilot, which was to use their phone and FlightRadar24. This provided the additional information required by the Trainer to break off the approach and provide the necessary separation. [The Supervisor] spoke to the glider pilot a few days later and hopefully next time an information call to ATC will aid this pilot, and ATC, should they wish to transit through [the Leeming] AOR.

Factual Background

The weather at Leeming was recorded as follows:

```
EGXE 231520Z 28010KT 9999 FEW045 SCT250 07/M02 Q1020 NOSIG RMK BLU BLU  
EGXE 231550Z 28011KT 9999 FEW045 SCT250 07/M02 Q1020 NOSIG RMK BLU BLU
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Analysis and Investigation

Military ATM

Utilising occurrence reports and information from the local investigation, outlined below are the key events that preceded the Airprox. Where available they are supported by screenshots to indicate the positions of the relevant aircraft at each stage. The screenshots are taken from NATS radars which are not available to the Leeming controllers and may therefore not be entirely representative of the picture available.

The Leeming Director controller was a trainee controller with one aircraft on frequency, a Hawk conducting a Surveillance Radar Approach to RW34RH at RAF Leeming. The Hawk was established at 2000ft following a standard-pattern radar training circuit. The Leeming Surveillance Radar Approach controller was also a trainee and with no aircraft on frequency was in position, utilising the shared Leeming Supervisor console, ready to initiate the handover of the Hawk.

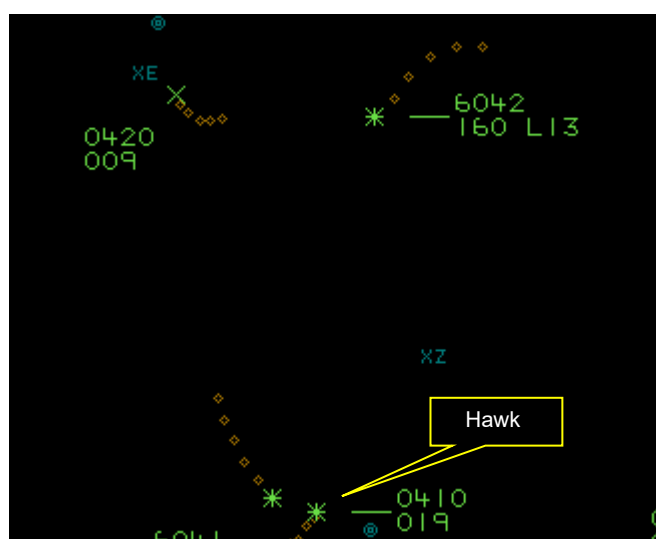


Figure 1 - 1532:10. Traffic Information was passed to the Hawk pilot regarding a faint radar contact (not displayed by NATS radar).

At 1532:10, the Hawk was 10NM from touchdown having just been turned onto a heading to intercept the centreline. Prompted by the instructor, the Leeming Approach Screen controller observed a faint contact to the east of the centreline and passed Traffic Information to the Hawk pilot, *“traffic left 11 o'clock, 5 miles, crossing right to left ahead, slow moving no height information”*.

At 1532:22, the Hawk pilot was transferred to the Leeming Surveillance Radar Approach controller.

The Leeming Surveillance Radar Approach controller was utilising the Leeming Supervisor console to conduct the approach in accordance with local orders for console allocation. The Leeming Supervisor was therefore unable, as standard, to utilise the laptop to gain additional situational awareness through [an EC device]. Instead, the Leeming Supervisor accessed FlightRadar24 via their mobile phone and, on observing the traffic information, was able to confirm the presence of a glider in that location at 2000ft.

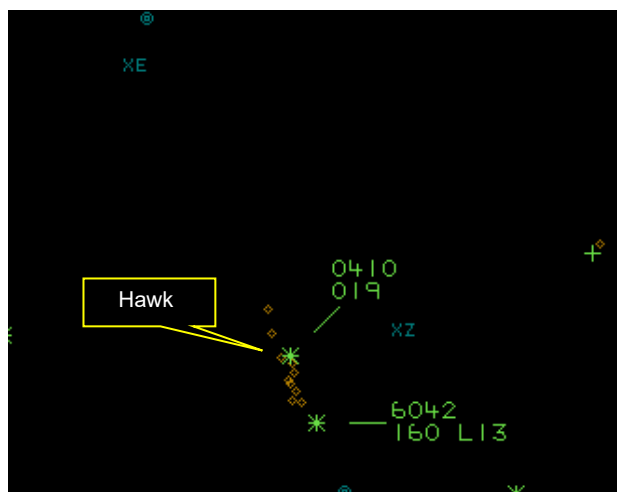


Figure 2 - 1533:05. Avoiding action was issued to the Hawk pilot.

Following discussion between the Leeming Supervisor and both instructors, at 1533:05, the Leeming Surveillance Radar Approach controller issued the Hawk pilot with avoiding action, “*avoiding action, turn left immediately heading 270 degrees, traffic 12 o’clock, 1 mile, opposite direction no height information*”. In following the avoiding action turn, the Hawk pilot became visual with the glider.

The CPA was unmeasured as the glider was not observed on the NATS radar. The CPA reported by the Hawk pilot was 400ft and 0.3NM.

There was no BM-specific local investigation conducted, however, BM supported the investigation conducted by the Hawk squadron.

Notably, the Hawk squadron investigation was able to identify the glider pilot and invite them to attend a Regional Airspace User Working Group. Whilst some glider pilots at the RAUWG acknowledged the benefits of informing Leeming ATC when operating in such proximity to the aerodrome, others also expressed the opinion that it was Class G airspace and, therefore, they were entitled to operate there freely.

The utilisation of Electronic Conspicuity systems such as Flightradar24 is increasing across military ATM, with both MAA and BM Policy to support its use. In this scenario, the utilisation of Flightradar24 by the Supervisor, albeit through a mobile phone, aided the decision-making process regarding the faint radar contact for both the Leeming Director and Surveillance Radar Approach controllers.

Notably, the Hawk pilot praised the actions of Leeming ATC for passing the initial Traffic Information and for the subsequent avoiding action which ensured separation.

UKAB Secretariat

An analysis of the NATS radar replay was undertaken and the Hawk could be positively identified from Mode S data (see Figure 3). An appropriate conversion factor was applied to the Flight Level observed on radar to convert it to an altitude. The LS8 was observed on radar a few minutes before CPA but the returns faded and the LS8 was not observed at the time of CPA. The pilot of the LS8 kindly supplied GPS track data for their flight. It was by combining the GPS and radar data that the diagram was constructed and the separation at CPA determined.

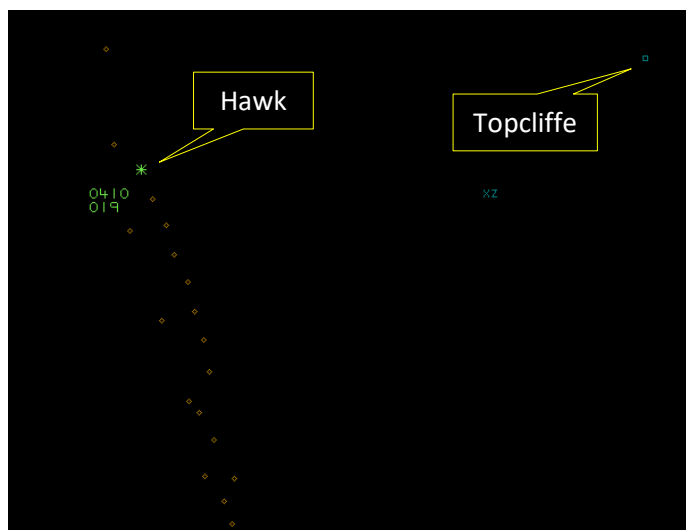


Figure 3 – CPA at 1533:24

The Hawk and LS8 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.² If the incident geometry is considered as head-on or nearly so then both pilots were required to turn to the right.³ If the incident geometry is considered as converging then the Hawk pilot was required to give way to the LS8.⁴

Comments

HQ Air Command

This serves as a valuable reminder that a MATZ does not provide guaranteed protection from civilian traffic as there is no legal obligation to contact the ATC unit when outside the ATZ. That said, it's disappointing to see an aircraft cross the instrument approach lane in such proximity to Leeming when the opportunity for coordination was there. The glider pilot attended the next Regional Airspace Users' Working Group (RAUWG) at RAF Leeming and the occurrence was used as a valuable case study. The pilot was receptive to the benefits of calling military ATC when transiting a MATZ and will strive to make a radio call in the future. The glider pilot holds the required Flight Radio Telephony Operators' Licence (FRTOL) but stressed that other glider pilots may be reluctant or unable to make such a call. They will share their experience with other club members and encourage this behaviour. The use of [ADS-B monitoring software] in this case made the difference to provide awareness for timely avoiding action. This unassured data may not always be available and emphasises the importance of factoring all radar returns. Traffic with a low radar cross-section travelling at slow speed will challenge many radar systems, which also highlights the importance of a visual lookout.

BGA

Where the legally-required Flight Radio Telephony Operator's Licence (FRTOL) is held and cockpit workload permits, glider pilots are encouraged to inform the Controlling Aerodrome ATC Unit before entering a MATZ or CMATZ.

The Leeming controllers are to be commended for using the LS8's Electronic Conspicuity transmissions to help them provide actionable Traffic Information to the Hawk.

² (UK) SERA.3205 Proximity. MAA RA 2307 paragraphs 1 and 2.

³ (UK) SERA.3210 Right-of-way (c)(1) Approaching head-on. MAA RA 2307 paragraph 13.

⁴ (UK) SERA.3210 Right-of-way (c)(2) Converging. MAA RA 2307 paragraph 12.

Summary

An Airprox was reported when a Hawk and an LS8 flew into proximity 3NM west of Topcliffe at 1533Z on Thursday 23rd February 2023. Both pilots were operating under VFR in VMC, the Hawk pilot in receipt of a Traffic Service from Leeming Radar and the LS8 pilot not in receipt of an ATS.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, radar photographs/video recordings, GPS track data for the LS8, reports from the air traffic controllers involved, a transcript of the RT recording (redacted) and reports from the appropriate operating authorities. Relevant 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 first considered the actions of the pilot of the Hawk. Members noted that they had received heading vectors for an SRA to Leeming and had been passed Traffic Information on a slow-moving contact 5NM ahead of them with no height information available. Members acknowledged that the Vale of York is a very popular location for recreational pilots and there are several very active sites in the area. Therefore, some members suggested that traffic described as being slow-moving with no height information might have indicated the presence of gliders or microlights. Nevertheless, it was agreed that it would not have been reasonable to have expected the pilot of the Hawk to have visually acquired a glider at a distance of 5NM. Members noted that when approximately 7NM from Leeming, the pilot of the Hawk had been passed to the SRA controller. Almost immediately, avoiding action had been issued with accompanying Traffic Information on a contact in their 12 o'clock, in the opposite direction and no height information. Within 13sec, the pilot of the Hawk had transmitted that they had turned and had visually acquired the contact which they later confirmed had been a glider. Members agreed that the pilot of the Hawk had had late situational awareness of the presence of the glider but acknowledged that they had reacted quickly to the avoiding action issued (**CF6**). Nevertheless, the visual acquisition of the LS8 had been late (**CF8**).

Turning their attention to the ground elements, members noted that the faint contact that had been displayed on the radar had prompted the Supervisor to use their mobile phone to access a website that displayed ADS-B information. Members understood that, if they had been at their normal console, the Supervisor would have had access to a laptop with which they could monitor glider activity from the local glider sites, but the Supervisor's console had been utilised by the Leeming SRA controller at that time. Nevertheless, members agreed that the communication and coordination between the Supervisor and ATCOs had facilitated the passing of pertinent Traffic Information to the pilot of the Hawk. Members pondered the timing of the awareness of the conflicting traffic and the subsequent passing of information to the pilot of the Hawk. Members were in agreement that situational awareness of the conflicting traffic could not have been gleaned more quickly. Nevertheless, in respect of the proximity of the glider to the Hawk, the situational awareness had been acquired late (**CF3**), consequently the conflict had been detected late (**CF2**) and the subsequent passing of Traffic Information to the Hawk pilot had been late (**CF1**). Again, members emphasised that the ground elements had acted as swiftly as they could have in the circumstances and that their actions had enabled the pilot of the Hawk to have taken last-minute avoiding action.

Members next considered the actions of the pilot of the LS8 and noted that their track had taken them into the Leeming CMATZ at an altitude that could reasonably have been anticipated could have conflicted with traffic on the approach to Leeming (**CF4**). Recalling the wording from Safety Sense leaflet 22 (Radiotelephony) published by the CAA, '*a Military Air Traffic Zone (MATZ) is not controlled airspace to civilian aircraft, however it is strongly recommended that pilots contact the relevant frequency prior to penetrating any area of a MATZ and abide by any instructions or routings given by the associated ATC unit. Civilian aircraft wishing to transit a MATZ should request a MATZ penetration service*'. Noting that the pilot of the LS8 had held a Flight Radio Telephony Operators Licence (FRTOL), members agreed that it would have been most prudent for the LS8 pilot to have contacted the Leeming controller and to have advised them of their intentions (**CF5**). It was further agreed that contact with the Leeming controller may have elicited information pertaining to traffic that might have conflicted with their

intended route. However, that had not been the case and the pilot of the LS8 had not had any awareness that the Hawk had been tracking towards them (CF6). Members also noted that the LS8 pilot's visibility had been hindered due to the position of the sun (CF9). It was acknowledged that, in the moments before CPA, the pilot of the LS8 had manoeuvred to highlight their presence to the Hawk pilot and had made a small deviation to the left.

In consideration of electronic conspicuity, members noted that the pilot of the Hawk had reported that they had received a TAS Traffic Alert. After some discussion, members concluded that it had been unlikely that such an alert would have been received as the TAS would not have been expected to have detected the presence of the LS8. Similarly, the EC equipment fitted to the LS8 would not have been expected to have detected the presence of the Hawk (CF7).

In determination of risk, members agreed that safety had been much reduced below the norm through the LS8 pilot's position in the approach path to Leeming and the Hawk pilot's late visual acquisition of the LS8. There had been a risk of collision and it had been the last-minute actions of the SRA controller in passing avoiding action to the Hawk pilot and the pilot's quick reactions that had meant the separation had not been less (CF10). As such, the Board assigned Risk Category B to this event.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

2023024				
CF	Factor	Description	ECCAIRS Amplification	UKAB Amplification
Ground Elements				
• Situational Awareness and Action				
1	Human Factors	• ANS Traffic Information Provision	Provision of ANS traffic information	TI not provided, inaccurate, inadequate, or late
2	Human Factors	• Conflict Detection - Detected Late	An event involving the late detection of a conflict between aircraft	
3	Contextual	• Traffic Management Information Action	An event involving traffic management information actions	The ground element had only generic, late, no or inaccurate Situational Awareness
Flight Elements				
• Tactical Planning and Execution				
4	Human Factors	• Aircraft Navigation	An event involving navigation of the aircraft.	Flew through promulgated and active airspace, e.g. Glider Site
5	Human Factors	• Communications by Flight Crew with ANS	An event related to the communications between the flight crew and the air navigation service.	Pilot did not request appropriate ATS service or communicate with appropriate provider
• Situational Awareness of the Conflicting Aircraft and Action				
6	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				
7	Technical	• ACAS/TCAS System Failure	An event involving the system which provides information to determine aircraft position and is primarily independent of ground installations	Incompatible CWS equipment
• See and Avoid				
8	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
9	Contextual	• Visual Impairment	Events involving impairment due to an inability to see properly	One or both aircraft were obscured from the other
• Outcome Events				
10	Contextual	• Near Airborne Collision with Aircraft	An event involving a near collision by an aircraft with an aircraft, balloon, dirigible or other piloted air vehicles	

Degree of Risk: B.

Safety Barrier Assessment⁵

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

Ground Elements:

Situational Awareness of the Confliction and Action were assessed as **partially effective** because the conflict between the aircraft had been detected late by the Leeming controller (albeit as soon as the radar return had been displayed).

Flight Elements:

Tactical Planning and Execution was assessed as **partially effective** because the pilot of the LS8 had flown through active airspace and had not communicated their intentions to the Leeming controller.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because the pilot of the LS8 had not had situational awareness of the presence of the Hawk.

Electronic Warning System Operation and Compliance were assessed as **ineffective** because the EC equipment fitted to each aircraft would not have been expected to have detected the other.

Airprox Barrier Assessment: 2023024		Outside Controlled Airspace					
Barrier	Provision	Application	Effectiveness				
			Barrier Weighting				
			0%	5%	10%	15%	20%
Ground Element	Regulations, Processes, Procedures and Compliance	✓	✓	[Green bar: 0% to 5%]			
	Manning & Equipment	✓	✓	[Green bar: 0% to 2.5%]			
	Situational Awareness of the Confliction & Action	⚠	⚠	[Yellow bar: 0% to 15%]			
	Electronic Warning System Operation and Compliance	⊘	⊘	[Grey bar: 0% to 2.5%]			
Flight Element	Regulations, Processes, Procedures and Compliance	✓	✓	[Green bar: 0% to 10%]			
	Tactical Planning and Execution	✓	⚠	[Yellow bar: 0% to 10%]			
	Situational Awareness of the Conflicting Aircraft & Action	✗	✓	[Red bar: 0% to 20%]			
	Electronic Warning System Operation and Compliance	✗	✗	[Red bar: 0% to 15%]			
	See & Avoid	✓	✓	[Green bar: 0% to 20%]			
Key: Full Partial None Not Present/Not Assessable Not Used							
Provision	✓	⚠	✗	⊘			
Application	✓	⚠	✗	⊘	○		
Effectiveness	[Green]	[Yellow]	[Red]	[Grey]	[White]		

⁵ The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the [UKAB Website](#).