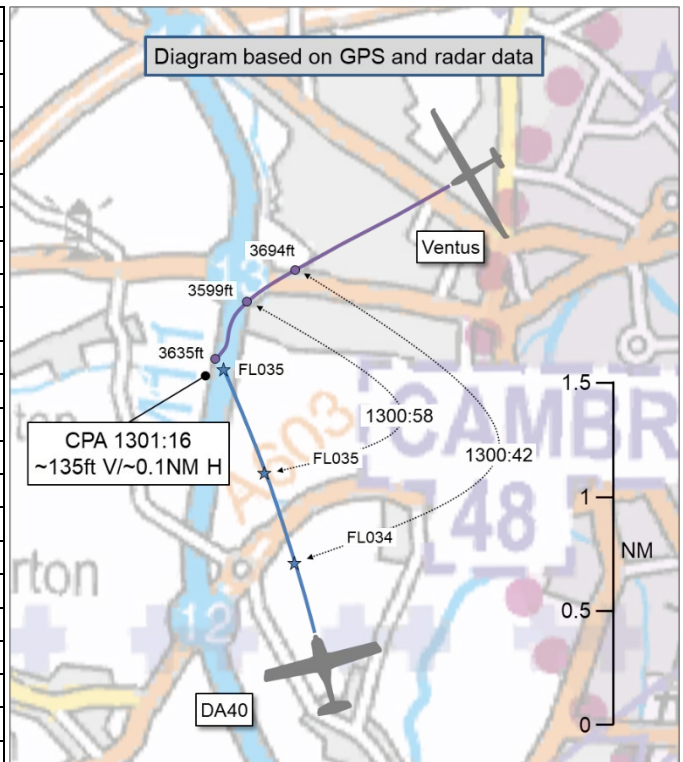


AIRPROX REPORT No 2024124

Date: 17 Jun 2024 Time: 1301Z Position: 5213N 00005E Location: 4NM W Cambridge

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	DA40	Ventus
Operator	Civ FW	Civ Gld
Airspace	London FIR	London FIR
Class	G	G
Rules	IFR	VFR
Service	Traffic	Basic
Provider	Cambridge Radar	Cambridge Radar
Altitude/FL	FL035	3635ft
Transponder	A, C, S+	Not fitted
Reported		
Colours	White	White
Lighting	Strobes, Indg, nav	Canopy strobe
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	3500ft	3800ft
Altimeter	QNH	QFE
Heading	340°	"west"
Speed	110kt	70kt
ACAS/TAS	TAS, SkyEcho	FLARM
Alert	None ¹	N/A
Separation at CPA		
Reported	0ft V/30m H	100ft V/50m H
Recorded	~135ft V/~0.1NM H	



THE DA40 PILOT reports that the flight was a training flight including instrument training procedures. Prior to the Airprox, a hold and ILS approach practice was completed, followed by a missed approach to climb initially to 2000ft, followed by a turn to 4000ft to waypoint SIVDA. During the climb to SIVDA, ATC reported a glider at 4400ft straight ahead (12 o'clock). The glider, [uninvolved with the Airprox], was spotted and they advised ATC that they would level-off at 3500ft until clear. After the level-off, they looked around for any other gliders as there were many glider pilots on the frequency and others that they had spotted on their route. When they looked to the right side, there was a glider at the same level heading towards their aircraft. The [pilot of the DA40] turned left about 30° to avoid it and they don't recall seeing the glider changing direction. When clear of the traffic, they advised ATC that there was another glider near Cambridge at that altitude. They then heard one of the glider pilots report there was another glider "in the stack". Straight after that, that glider pilot reported their position and advised that they weren't carrying a transponder.

[The DA40] was equipped with TAS, and the [pilot of the DA40] also had an [EC device] connected to ForeFlight on their iPad with audible alerts. The glider did not show on either. [The pilot of the DA40] wished to note that their route had been planned via SIVDA (instead of turning directly to Cambridge Airport) to avoid Gransden Lodge.

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

THE VENTUS PILOT reports that they were in contact with Cambridge and had reported overhead the airfield as instructed and gave their intentions as heading to Gransden Lodge airfield and then return on a reciprocal. They heard information being given to the pilot [of a powered aircraft] and several other glider pilots on the frequency. [However,] it was not clear to [the pilot of the Ventus] (from the positions

¹ The pilot of the DA40 reported that they had received a TAS TA. UKAB Secretariat assessed that that had not been an alert to the presence of the Ventus.

stated by the pilot of the powered aircraft) what their position or heading had been, but they were 'cleared to 4000ft'.

[The pilot of the Ventus] spotted a glider above them to the west thermalling a few kilometres away and flew to join them. They carried out the usual glider pilot scan cycle from wingtip-to-wingtip as they transited westwards. They saw the [DA40] appear in front of their port wing, estimated as between 1km and 750m away, and observed its movement. They pitched and rolled to attract [the pilot's] attention. They saw no change in the aircraft heading or any other indication that the pilot had seen them so they turned south to head behind [the DA40's] tail. This meant that their red canopy-strobes would have been in direct line-of-sight of the pilot. There was still no indication that they had been seen so they continued to avoid it. Once it had passed safely in front of them, they immediately turned to resume their heading to the thermalling glider.

[The pilot of the Ventus opined that] they only spotted the [DA40] as it appeared in front of their wing so they believe it had been blanked by their wing up to that point due to their relative tracks. It was close enough for them to have spotted it sometime earlier if it had been in plain sight.

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

THE CAMBRIDGE CONTROLLER OJTI reports that they were working as the Cambridge Radar ATCO, providing instruction to a low-hours trainee who had a large amount of experience of Class G radar operations from previous roles, when [the pilot of the DA40] reported an Airprox on frequency.

[The pilot of the DA40] had been conducting training instrument approaches at Cambridge under a Traffic Service before going-around to depart IFR, climbing to altitude 4000ft and routeing to the north before returning to [destination]. On returning to the Cambridge Radar frequency 120.965MHz, [the pilot of the DA40] was provided with a Traffic Service with reduced Traffic Information due to limited surveillance performance as they had previously received that service prior to transfer to Tower.

Traffic levels were heavy with approximately 6-8 gliders on frequency as well as [the pilot of the DA40], however complexity was low. The trainee was coping well with the workload and was being provided with support. [The pilot of the DA40] was given a climb to altitude 4000ft (as requested) and passed Traffic Information on a glider that could be seen on the surveillance display approximately 3-4NM west of Cambridge indicating 4400ft. [The pilot of the DA40] reported visual with that glider and then reported stopping their climb at altitude 3500ft. They continued at that level for a couple of miles before reporting an Airprox with another glider. They reported that this glider was on their right-hand side at the same level on the western edge of Cambridge city.

[The Cambridge controller] had been providing a Basic Service to [the pilot of the Ventus] who had last reported in the Cambridge overhead at 1252 but was not showing on radar. They believe that the glider which had the Airprox may have been [the Ventus].

THE CAMBRIDGE TRAINEE CONTROLLER reports that they were under instruction in APS, and called traffic to [the pilot of the DA40 in receipt of a Traffic Service] on glider traffic to which they replied 'in sight'. As they passed under that glider, the pilot asked if they were working another glider as one had passed very close to them. [The Cambridge Trainee controller] replied "*I'm working about 6*". At that point, the [OJTI] asked if [the pilot of the DA40] would like to file an Airprox, and the pilot replied "yes" and more details were taken over the telephone later that day. The glider involved in the Airprox was believed to be [the Ventus] .

Factual Background

The weather at Cambridge was recorded as follows:

METAR EGSC 171250Z 24008KT 200V270 9999 FEW030 SCT048 21/10 Q1010

Analysis and Investigation

Cambridge Unit Investigation

APS was working traffic with moderate workload and heavy RT loading. [The pilot of the DA40] departed Cambridge to the north-west, having conducted a training approach. On passing west abeam Cambridge, [the pilot of the DA40] came into proximity with a glider, believed to be [the Ventus]. [The pilot of the DA40] reported an Airprox with a glider 3.6NM from Cambridge, on a bearing of 277° at altitude 3500ft.

Timeline:

1225:33 [The pilot of the DA40] checked in on frequency 120.965MHz, was identified and given a Traffic Service.

1238:45 Primary-only traffic appeared 10NM NE of Cambridge (believed to be [the Ventus]).

1243:26 [The pilot of the Ventus] called up on frequency and was asked to standby.

1245:00 A contact, believed to be [the Ventus], appeared for 3sec (DF trace went through the contact and the position report correlated with the aircraft's position). [The pilot of the Ventus] was passed all requisite details and asked to report overhead Cambridge. Altitude was reported as 4500ft.

1246:19 [The pilot of the DA40] was CAM-outbound for the procedural ILS and reported levelling-off due to a glider. The glider popped-up on radar as [the DA40 pilot] reported levelling-off. The traffic was 12 o'clock at approximately 0.25NM with no squawk showing. The [pilot of the DA40] also made a turn of approximately 20-30° to the left to avoid the contact before re-establishing on the outbound leg.

1252:45 [The pilot of the Ventus] was given the new QNH 1010hPa. [The pilot of the Ventus] reported approaching the overhead from the east. The APS ATCO then asked the pilot to report if they descend below altitude 2500ft.

1256:39 [The pilot of the DA40] reported back on frequency, was identified and given a Traffic Service. Traffic Information was passed on [an uninvolved glider, henceforth "glider 'B'"]. [The pilot of the DA40] was given a climb to altitude 4000ft and their own navigation to SIVDA. Generic Traffic Information was then passed to [the pilot of glider 'B'].

1300:17 [The pilot of the DA40] was given updated Traffic Information on [glider 'B'] and reported the glider in sight.

1300:58 [The pilot of the DA40] advised that they had levelled-off momentarily (indicating altitude 3400ft with 4000ft selected via Mode S).

1301:28 [The pilot of the DA40] asked if there was another glider pilot on frequency, and the APS ATCO responded with "*I have about 6 gliders on frequency at the moment*".

1301:46 [The pilot of the DA40] reported they had come very close to a glider over Cambridge 1 mile previously. The APS ATCO replied with "*that was the glider you were visual with about 500 or 1000ft above*" [i.e. glider 'B'].

[The pilot of the DA40] pilot responded with "*no, this one was at 3500ft*". The APS ATCO replied with "*I can't see that one on radar*".

1302:05 [The pilot of the Ventus] called up saying that they were underneath the one that was seen on radar at 3600ft.

[UKAB Secretariat note: It is understood that the pilot of the Ventus had been at 3600ft, and that they were below the other glider (glider 'B') that had been at 4500ft].

1302:20 [The pilot of glider 'B'] reported they were visual with the fixed-wing traffic that had passed underneath but there was a second glider in the stack at the moment that they thermalled just to the north of the airfield.

1303:12 [The pilot of the DA40] asked for the registration of the glider mentioned at 3500ft.

1303:26 The OJTI then asked if this was the glider that they had encountered on the outbound leg. The [DA40] pilot responded "*negative, that was another one. In the climb-out, when we levelled-off for the glider that was at 4600ft. On looking right there was a glider same level. Came-in very close*".

1303:43 The OJTI then said "*we have multiple gliders in close proximity in the area. Do you wish to file an Airprox?*". The pilot advised the Airprox happened at altitude 3500ft and the OJTI requested they call Cambridge ATC on landing.

A potential contact appeared at 1306:00, approximately 280° at 6NM before disappearing 40sec later at approximately 6.5NM that could have been [the Ventus]. The OJTI and trainee were then removed from position, a handover commenced at 1308:00.

UKAB Secretariat

An analysis of the NATS radar replay was undertaken and the DA40 could be positively identified from Mode S data. The pilot of the Ventus kindly supplied GPS track data for their flight and an intermittent, primary-only return on the radar replay was subsequently determined to have been the Ventus (Figure 1).

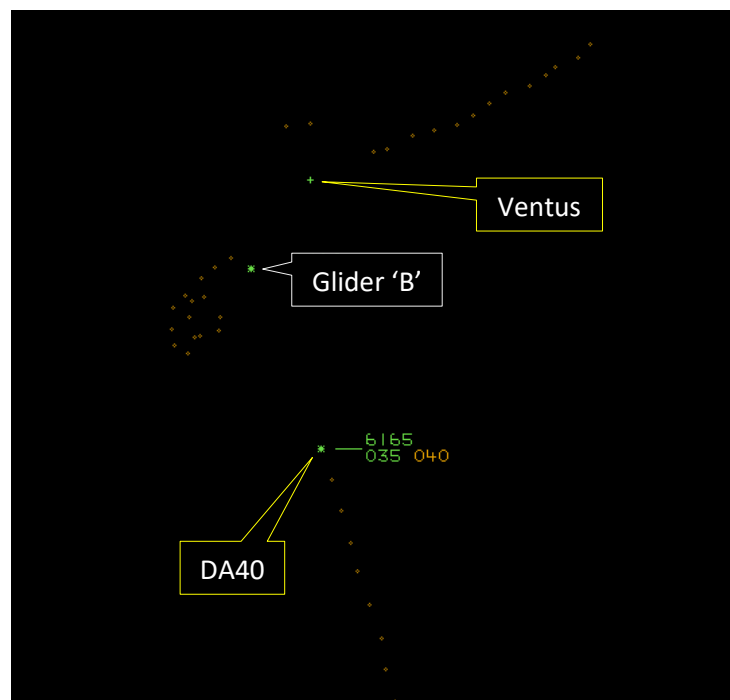


Figure 1 – Aircraft positions at 1301

The Ventus faded from radar replay in the moments before CPA (Figure 2).

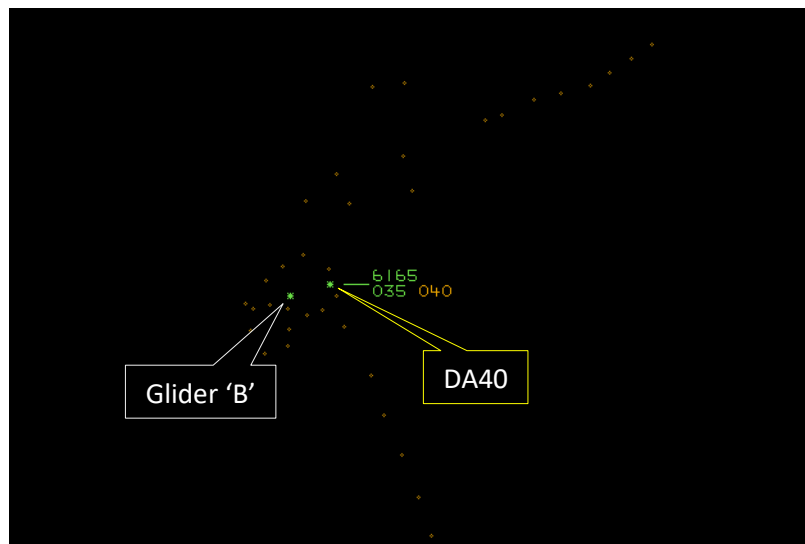


Figure 2 – Aircraft positions at 1301:14 (2sec before CPA)

The diagram was constructed and the separation at CPA determined by combining the data sources. Analysis of the recorded position and time of the aircraft appeared to indicate that the Ventus had passed in front of (and above) the DA40. In the diagram, the DA40 is depicted at Flight Levels and, for ease of comparison, the Ventus is depicted at altitudes referenced to 1013hPa.

The DA40 and Ventus 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 converging then the DA40 pilot was required to give way to the Ventus.³

Comments

AOPA

Until the CAA and Department for Transport finalise the commonality of electronic conspicuity and ensure all systems are shown on a pilot's display, or pilots inform Air Traffic units of their intentions, lookout is the final barrier in avoidance of a mid-air collision.

BGA

The DA40 pilot is to be commended for their awareness of the intense gliding activity near Gransden Lodge gliding site (where there were 226 aircraft movements that day), and for routeing to avoid it.

Almost all glider operators in the UK (including the Ventus' owner/operator) have voluntarily fitted proprietary EC equipment that warns of impending conflicts with other similarly-equipped aircraft. Although this system has proved effective at mitigating the risk of Airprox with other gliders, basic installations do not detect aircraft equipped only with transponders or ADS-B-out ('Mode S+'), as in this case. However, recent versions of this EC equipment can optionally add a 1090MHz receiver subsystem and thereby warn of conflicts with transponder and ADS-B-out-equipped aircraft. Upgrading glider EC hardware to add such a 1090MHz receiver subsystem would provide a useful additional safety barrier in airspace with a high density of transponder or ADS-B-out equipped aircraft.

Equally, the carry-on TAS device on board the DA40 can be configured to receive transmissions from glider EC equipment, displaying nearby glider traffic via the associated EFB application (ForeFlight in this instance, but other compatible EFB applications are available). Enabling this option would provide a useful additional safety barrier in airspace where gliders operate.

² (UK) SERA.3205 Proximity.

³ (UK) SERA.3210 Right-of-way (c)(2) Converging.

Summary

An Airprox was reported when a DA40 and a Ventus flew into proximity 4NM west of Cambridge at 1301Z on Monday 17th June 2024. The DA40 pilot had been operating under IFR in VMC and in receipt of a Traffic Service from Cambridge Radar. The Ventus pilot had been operating under VFR in VMC and in receipt of a Basic Service from Cambridge Radar.

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 flight of the Ventus, reports from the air traffic controllers involved and a report from the appropriate operating authority. 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 DA40. Members agreed that the TAS and additional EC device fitted to the DA40 would not have been expected to have detected the Ventus (**CF5**), but noted that the pilot of the DA40 had been aware of several glider pilots on the Cambridge frequency. It was agreed that, although they had not had specific knowledge of the Ventus, the pilot of the DA40 had had generic situational awareness (**CF4**). Members agreed that the pilot of the DA40 had sighted the Ventus late (**CF6**), but noted that they had had time to have taken avoiding action. Nevertheless, members appreciated that to have sighted a glider in such close proximity had caused the pilot of the DA40 some concern (**CF8**).

The Board next turned their attention to the actions of the pilot of the Ventus. Members noted that the EC device fitted to the Ventus would not have been able to detect the presence of the DA40 (**CF5**). However, members noted that the Ventus pilot had heard that the pilot of 'a powered aircraft' (the DA40) had been cleared by the Cambridge Radar controller to 4000ft, but they had not understood the location mentioned (SIVDA). Consequently, members agreed that the pilot of the Ventus had had generic situational awareness of the presence of the DA40 (**CF4**) but had not been aware that they had been on a converging course. Some members pointed out that ILS waypoints are not displayed on VFR navigational charts and expressed some sympathy with the pilot of the Ventus. Other members felt that, as Cambridge Airport is depicted on navigational charts with 'feathers' denoting the presence of Instrument Approach procedures, it may have been prudent to have had an appreciation of the typical routes and altitudes involved with the procedure. Notwithstanding, as the pilot of the Ventus had been in contact with the Cambridge Radar controller in receipt of a Basic Service, members agreed that, if they had not known the name of ILS waypoints in the vicinity of their own position and track, it may have been prudent to have requested further information (**CF3**), particularly as the altitude mentioned had been approximately the altitude at which they had been operating .

It was noted that the pilot of the Ventus had sighted the DA40 at some distance (estimated by the pilot of the Ventus to have been between 750m and 1km), and members noted that they had pitched and rolled in an attempt to attract the DA40 pilot's attention. Members noted that the pilot of the Ventus had perceived that the DA40 pilot had not visually acquired them and had subsequently manoeuvred to increase separation. Notwithstanding the SERA rules on converging aircraft, members were in agreement that the pilot of the Ventus had flown close enough to the DA40 to have caused the DA40 pilot concern (**CF7**).

Turning their attention to the actions of the Cambridge Radar controller, members noted that they had provided a Traffic Service to the pilot of the DA40. As such, members agreed that Traffic Information pertaining to contacts observable on their radar screen would have been passed. Indeed, Traffic Information on the presence of 'Glider B' had been passed and the pilot of the DA40 had responded by arresting their climb. Members reviewed the NATS radar replay (which may have presented a different view to the radar screen available to the Cambridge Radar controller) and noted that the radar returns from the Ventus had become somewhat sporadic, and had disappeared from view several radar sweeps before CPA. Members also noted that the radar returns from the Ventus had been observed as a primary-only contact without an altitude. It was therefore agreed by members that, although the

Cambridge Radar controller had been aware of the Ventus (as they had provided a Basic Service to the Ventus pilot) they had not had specific situational awareness of its position. Members agreed that having only generic situational awareness of the Ventus (**CF2**), and with indeterminate radar returns observable in the moments leading to CPA, the Cambridge Radar controller had not been able to detect a potential conflict with the DA40 (**CF1**).

Concluding their discussion, members agreed that both pilots had had generic, rather than specific, situational awareness of the other aircraft. It was also agreed that the Cambridge Radar controller could not have detected a potential conflict between the aircraft. Members agreed that the pilot of the Ventus had visually acquired the DA40 in time to have considered the safest course of action and had attempted to highlight their position by manoeuvring to attract attention. However, the pilot of the DA40 had sighted the Ventus late, and the separation between the aircraft had reduced to such an extent that members agreed that the pilot of the Ventus had flown close enough to have caused the DA40 pilot concern. Members were satisfied that there had not been a risk of collision and assigned Risk Category C to this event.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

2024124				
CF	Factor	Description	ECCAIRS Amplification	UKAB Amplification
Ground Elements				
• Situational Awareness and Action				
1	Human Factors	• Conflict Detection - Not Detected	An event involving Air Navigation Services conflict not being detected.	
2	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				
• Situational Awareness of the Conflicting Aircraft and Action				
3	Human Factors	• Lack of Communication	Events involving flight crew that did not communicate enough - not enough communication	Pilot did not request additional information
4	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				
5	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				
6	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
7	Human Factors	• Lack of Individual Risk Perception	Events involving flight crew not fully appreciating the risk of a particular course of action	Pilot flew close enough to cause concern
8	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: C.

Safety Barrier Assessment⁴

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

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 **ineffective** because the Cambridge controller could not have detected the position of the Ventus that had not been fitted with a transponder.

Flight Elements:

Situational Awareness of the Conflicting Aircraft and Action were assessed as **partially effective** because both pilots had had generic situational awareness of the presence of the other aircraft.

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 presence of the other aircraft.

See and Avoid were assessed as **partially effective** because the pilot of the Ventus had flown close enough to the DA40 to have caused its pilot concern.

Airprox Barrier Assessment: 2024124		Outside Controlled Airspace		Effectiveness				
Barrier		Provision	Application	Barrier Weighting				
				0%	5%	10%	15%	20%
Ground Element	Regulations, Processes, Procedures and Compliance	✓	✓					
	Manning & Equipment	✓	✓					
	Situational Awareness of the Confliction & Action	✗	✗					
	Electronic Warning System Operation and Compliance	○	○					
Flight Element	Regulations, Processes, Procedures and Compliance	✓	✓					
	Tactical Planning and Execution	✓	✓					
	Situational Awareness of the Conflicting Aircraft & Action	⚠	⚠					
	Electronic Warning System Operation and Compliance	✗	✓					
	See & Avoid	⚠	⚠					
Key:		Full	Partial	None	Not Present/Not Assessable	Not Used		
Provision	✓	⚠	✗	○				
Application	✓	⚠	✗	○	○			
Effectiveness								