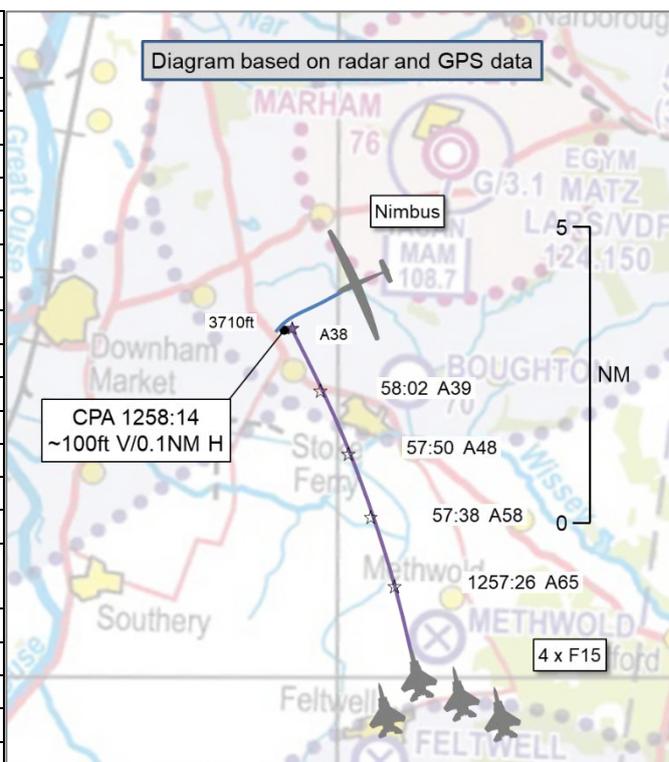


**AIRPROX REPORT No 2021025**

Date: 17 Apr 2021 Time: 1258Z Position: 5236N 00029E Location: 4NM SW RAF Marham

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

Recorded	Aircraft 1	Aircraft 2
Aircraft	Nimbus	F15 formation
Operator	Civ Gld	Foreign Mil
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	Listening Out	Traffic
Provider	(Marham LARS)	Lakenheath
Altitude/FL	3710ft	FL034 (3800ft)
Transponder	Not fitted	A, C, S
<b>Reported</b>		
Colours	White	Grey
Lighting	Not fitted	NK
Conditions	VMC	VMC
Visibility	20NM	>10km
Altitude/FL	FL040	~3000ft
Altimeter	SPS QNH 1028hPa	QNH (NK hPa)
Heading	245°	360°
Speed	90kt	290kt
ACAS/TAS	FLARM	TCAS II
Alert	None	None
<b>Separation</b>		
Reported	100ft V/0m H	500ft V/1NM H
Recorded	~100ft V/0.1NM H	



**THE NIMBUS PILOT** reports conducting a cross country glider flight on the leg towards March. The pilot was clear vertically of the Marham zone, but was monitoring their frequency. Only traffic calls were being made as the Tower was closed and, being clear of the zone, the pilot just continued to monitor. After passing Marham they noticed initially four aircraft to the left, flying abeam in formation, then two more behind them. They were at the same height and at closing range. Assuming they hadn't been seen, the pilot considered the best action to descend and pass below the aircraft, and initiated a descent by opening the airbrakes and increasing speed to around 90kts. They didn't see a reaction from the other aircraft to suggest the glider had been seen, but the descent was enough to remove the collision risk. When they passed there was no lateral separation but the pilot estimated the closest jet passed overhead with 50-100ft vertical separation.

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

**THE F15 PILOT** reports being approximately 5.5 hours into a sortie to Lakenheath. The formation (a flight of 6) had just crossed the English Channel at 26,000 ft and was about 50NM from the base under a deconfliction service with London Mil. They initiated a descent down to altitude for initial at the base and handed the formation off to Lakenheath approach. As they completed the descent in a non-standard 4+2 split, the formation leader commanded the rejoin to fingertip [formation]. As they continued the descent and initiated the rejoin, the focus was on the leader as the formation members closed from approximately 0.7NM to close formation. As they were levelling off at around 3,000 feet they received a callout from Approach that they had traffic off the nose, altitude unknown. The F15 pilot immediately transitioned to the radar, picked up a hit just under 5 miles off the nose and picked up visual scanning. The F15 pilot and the flight lead, quickly saw the glider and that it was a factor to the formation. Numbers 1, 2 and 4 separated laterally to deconflict while the F15 pilot initiated a climb to pass over the glider

and not conflict. They noticed the glider initiate a dive as they approached and passed overhead by about 500ft before continuing the rejoin and entering the pattern.

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

**THE LAKENHEATH CONTROLLER** reports vectoring a flight of 6 x F15s northbound for a descent when they noticed a target operating near Marham. The F15s were under a Traffic Service so the controller gave a traffic call when the aircraft were 15 miles from the primary only target. The target did not have a transponder and was not on the Lakenheath frequency. When the contacts were 5 miles apart, the F15s called the traffic in sight. Once they had the aircraft in sight, they were vectored southbound to continue their landing at RAF Lakenheath.

## **Factual Background**

The weather at Marham was recorded as follows:

METAR EGYM 171250Z AUTO 10005G15KT 9999 FEW050/// 12/M02 Q1029=

## **Analysis and Investigation**

### **UKAB Secretariat**

The Nimbus and F15 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.<sup>1</sup> If the incident geometry is considered as converging then the F15 pilots were required to give way to the Nimbus.<sup>2</sup>

## **Comments**

### **BGA**

A listening watch on a station known to be unmanned will not provide much SA, and none to other airspace users - the Nimbus pilot would likely been better served by calling Lakenheath, who would have been aware of the conflicting traffic. That said, it is surprising that having received Traffic Information and obtained radar and visual contact at about 5NM the F15s should have passed so close, as shown by the radar/GPS recorded separation.

## **Summary**

An Airprox was reported when a Nimbus glider and a formation of F15s flew into proximity near Marham at 1258Z on Saturday 17<sup>th</sup> April 2021. All the pilots were operating under VFR in VMC, the F15 formation in receipt of a Traffic Service from Lakenheath and the Nimbus pilot listening out on the Marham LARS frequency.

## **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 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.

Due to the exceptional circumstances presented by the coronavirus pandemic, this incident was assessed as part of a 'virtual' UK Airprox Board meeting where members provided a combination of written contributions and dial-in/VTC comments.

<sup>1</sup> (UK) SERA.3205 Proximity. MAA RA 2307 paragraphs 1 and 2.

<sup>2</sup> (UK) SERA.3210 Right-of-way (c)(2) Converging. MAA RA 2307 paragraph 12.

Board members first discussed the F15 4-ship and its pilots' SA and actions. The F15 formation had been given Traffic Information on the Nimbus, albeit with an unknown altitude (**CF3**), and the reporting F15 pilot confirmed radar contact on the glider at a range of just under 5NM. The Board thought this could have provided sufficient SA to enable the F15 formation to give way to the glider, which was crossing from right to left, however, it was apparent from the radar replay and glider GPS log file that one of the F15s had passed in close proximity to the Nimbus. Members thought that the formation leader may have had the opportunity to 'kick right' when passed Traffic Information, thereby discharging their responsibility to give way to the glider, rather than taking avoiding action at a later stage (**CF2**). The radar replay did not show 4 separate tracks for the 4-ship so, notwithstanding the reporting F15 pilot's narrative, it was not possible definitively to ascertain which of the F15 formation had flown closest to the Nimbus. The Board felt that, even though the formation members took avoiding action, the separation at CPA was such that the Airprox F15 pilot may have either not seen the glider, perhaps lost sight of it or simply overestimated separation at CPA. Even if all the F15 pilots had remained visual with the Nimbus, members agreed that the Airprox F15 had passed close enough to cause concern (**CF5**). Turning to the Nimbus pilot, members agreed that although using an ATC frequency was a wise course of action, using that of an agency that was closed was arguably less effective. Without an integrated ATM system it was sometimes not possible to know which agency could provide an appropriate service, but members felt that an active frequency would have been a better choice (**CF1**). Unfortunately, the aircraft had incompatible EC (**CF4**), but members noted that at least the Nimbus pilot was visual with the F15s. The Board discussed the risk and agreed that although the F15 formation had a degree of SA on the Nimbus, one of the formation had flown into proximity. The Nimbus pilot had also taken avoiding action, the act of using airbrake being an indication of their perceived threat. Members acknowledged that a fast moving aircraft of the size of an F15 can be perceived as being closer than is actually the case and that radar smoothing algorithms could result in the F15's vertical separation being under-represented on the radar replay. However, members felt on balance that the speed of closure and recorded and reported separation at CPA was such that safety had been much reduced (**CF6**).

## **PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK**

### Contributory Factors:

	2021025			
CF	Factor	Description	ECCAIRS Amplification	UKAB Amplification
<b>Flight Elements</b>				
<b>• Tactical Planning and Execution</b>				
1	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
2	Human Factors	• Late Decision/Plan	Events involving flight crew making a decision too late to meet the needs of the situation	
<b>• Situational Awareness of the Conflicting Aircraft and Action</b>				
3	Contextual	• Situational Awareness and Sensory Events	Events involving a flight crew's awareness and perception of situations	Pilot had no, late or only generic, Situational Awareness
<b>• Electronic Warning System Operation and Compliance</b>				
4	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
<b>• See and Avoid</b>				
5	Human Factors	• Incorrect Action Selection	Events involving flight crew performing or choosing the wrong course of action	Pilot flew close enough to cause concern
<b>• Outcome Events</b>				
6	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.

Recommendation: Nil.

Safety Barrier Assessment<sup>3</sup>

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 F15 formation did not manoeuvre to give way to the Nimbus by a greater margin having had sufficient SA to do so.

**Situational Awareness of the Conflicting Aircraft and Action** were assessed as **partially effective** because the Nimbus pilot did not have SA of the F15 formation and the F15 formation's SA did not prompt a turn to give way to the Nimbus.

**Electronic Warning System Operation and Compliance** were assessed as **ineffective** because the aircrafts' EC devices were incompatible.

**See and Avoid** were assessed as **partially effective** because the F15 formation's avoiding action occurred at a late stage, as evidenced by separation at CPA.

Airprox Barrier Assessment: 2021025		Outside Controlled Airspace						
Barrier	Provision	Application	Effectiveness 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	✓	!					
<b>Key:</b>								
Provision	Full	Partial	None	Not Present/Not Assessable	Not Used			
Application	✓	!	✗	○	○			
Effectiveness	Green	Yellow	Red	Grey	Red box			

<sup>3</sup> The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the [UKAB Website](#).