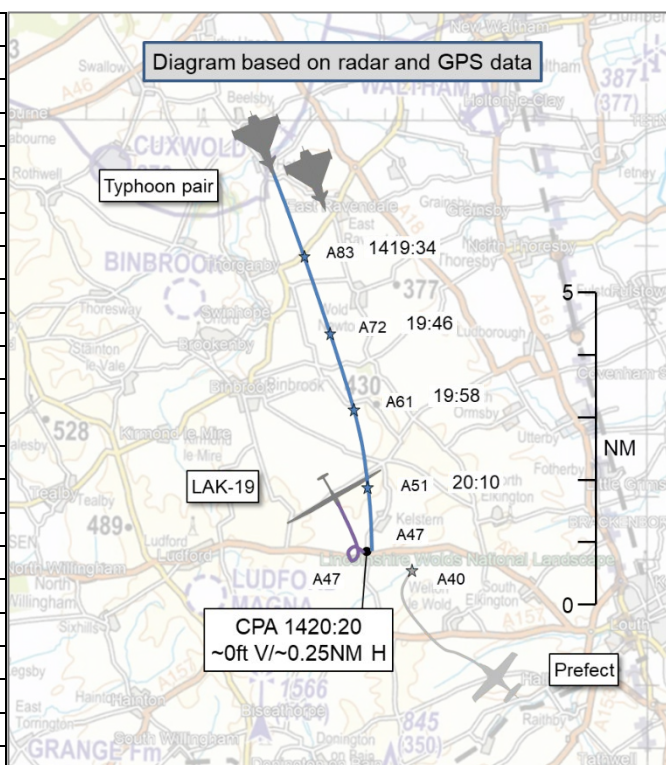


AIRPROX REPORT No 2024227

Date: 29 Aug 2024 Time: 1420Z Position: 5324N 00008W Location: Kelstern

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Typhoon No.2	LAK-19 glider
Operator	HQ Air (Ops)	Civ Gld
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	Traffic	Listening Out
Provider	Coningsby App	Hus Bos Radio
Altitude/FL	4700ft	~4700ft
Transponder	A, C, S	Not fitted
Reported		
Colours	Grey	White
Lighting	HISL, nav	Not fitted
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	4740ft	~4000ft
Altimeter	QNH (1017hPa)	QFE (NK hPa)
Heading	175°	180°
Speed	350kt	80kt
ACAS/TAS	Not fitted	SkyEcho
Alert	N/A	None ¹
Separation at CPA		
Reported	0ft V/100-200ft H	0ft V/100m H
Recorded	~0ft V/~0.25NM H	



THE TYPHOON FORMATION PAIR LEAD PILOT reports that, during recovery to Coningsby from the north, as the formation descended through a break in the cloud through approximately altitude 6000ft, the Coningsby Approach controller called traffic, a Prefect at 3000ft climbing. [The formation lead pilot] had sensor contact and reported that the formation wouldn't go below 5000ft. On building further situational awareness and utilising the Helmet Mounted Symbology System (HMSS²) to get visual, the formation continued to descend as the Prefect passed low and to the left. At the same time, [the formation lead pilot] saw a glider, co-altitude, extremely close on the right side of the formation in what appeared to be a hard banked turn towards the formation. [The lead pilot] passed this information to [the No.2 pilot] (who was on the right in arrow) at the same time as [the No.2 pilot] was passing information on the Prefect's location to [the lead pilot]. [The No.2 pilot] was looking left throughout (both to maintain formation and to acquire the Prefect visually). However [the lead pilot] assessed that the glider was likely somewhere around 100-200ft away from [the No.2 aircraft] turning hard towards and likely passed directly behind. Shortly after this, the controller passed information on two further gliders within close proximity. One of these gliders passed low and close to the formation with both the glider pilot and [the lead pilot] acknowledging their presence with a wing rock. Following a tape review, the [Airprox] glider was visible in [the No.2 Typhoon] HUD footage from 1420:16Z to 1420:19Z.

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

THE LAK-19 PILOT reports seeing 2 'jet fighters' at a range of about 1NM. It was difficult to assess their direction initially as their turn to port was indicated by the jet trail and their trajectory seemed to miss to the port. They assumed that they were 'being investigated' as the Typhoons turned towards them to run parallel rather than to their starboard, to avoid at the rear. It looked like they would pass at a lower altitude but they climbed to their level and, they think, veered starboard with little change in

¹ The LAK-19 pilot was operating without a traffic display for the SkyEcho.

² <https://www.baesystems.com/en-uk/product/typhoon-helmet>

altitude. The glider pilot assumed (perhaps wrongly) that military pilots kept their eyes open and were 'checking them out' given their proximity to Coningsby airfield. They had received 3 similar proximities near other military airfields that they remembered over the last 30 years. They had the impression the Typhoons slowed down when abeam at their level so they gave them a wave but perhaps they were a little too far away and [too far] past to see; they couldn't identify a pilot. The glider pilot noted that they usually use [a common glider TAS] with ADS-B in but on this occasion it was inoperative (it has now been replaced) and they only had ADS-B out. They thought that perhaps they should change their assessment of risk ['None'] to 'High' if the Typhoon pilots hadn't seen them at some distance or even at all. The glider pilot made a slight turn to starboard [to increase separation] but there was very little time to take avoiding action.

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

THE CONINGSBY APPROACH CONTROLLER reports they were bandboxed Director, Departures and LARS controlling positions. [The Typhoon formation pair] were pre-noted inbound as a visual recovery and were handed over from Swanwick Mil about 2NM southeast of Humberside Airport at FL120 on a south-easterly heading. As SOP, they were identified and placed under a Traffic Service on initial contact and were asked if they were in receipt of the latest [ATIS]. Having been pre-noted as a visual recovery, they were given the Coningsby QNH, own navigation and descent with responsibility for their own terrain separation. This was a standard recovery procedure at Coningsby. At this point they had noticed there was an aircraft transponding 4272 (NMC) about 10NM southeast, manoeuvring slowly. With the expected turn of [the Typhoon formation pair] onto a southerly heading for recovery they deemed this particular track to be no factor and elected not to call Traffic Information. About 10NM south-southeast of [the Typhoon formation pair] there was an aircraft transponding intermittent Mode A (NMC), barely manoeuvring, and another track again south-southeast of [the Typhoon formation pair] at about 13NM transponding 7001, Mode C indicating 1100ft, tracking northwest. There were a further 2 non-squawking contacts also sighted on radar, about 15NM south-southwest and west-southwest of [the Typhoon formation pair]. During this time the controller was trying to deduce what this activity was with the aid of FLARM (located on the Supervisor's position 2 control consoles away). Moments later [a Prefect pilot] free-called Coningsby Zone with a low-level pull-up for general handling (GH) west of Louth by about 3NM. This aircraft was the aircraft previously squawking 7001, as mentioned before. The aircraft was identified, the pilot placed under a Traffic Service and was requested to confirm the altitude to which they were climbing. The pilot requested the block 3000-10,000ft for GH. They were given the requested block on the Barnsley RPS, a reminder for own terrain separation and instructed to report 1min prior to completion. During this time [the Typhoon formation pair] had adopted a more southerly heading and were in conflict with [the Prefect] at a range of about 5NM. At the time Traffic Information was passed to [the Typhoon formation pair] the controller believed their Mode C indicated 6500ft descending, with the Prefect's Mode C indicating 3400ft climbing; [the Typhoon formation pair] opted to stop descent at 5000ft and when Traffic Information was passed to [the Prefect pilot] they stated they were visual with the traffic. Almost simultaneously a radio transmission from [one of the Typhoon formation pair] stated "Glider right". The controller recalled passing Traffic Information on traffic in their 6 o'clock at ½NM. This was believed to be the intermittent track that was previously mentioned. The controller stated that in hindsight, and having had the opportunity to see a radar playback of the scenario, there was scope to pass Traffic Information on all of the potential conflicts which could have allowed the aircrew to be better situationally aware with them potentially opting not to descend through cloud. The controller believed that their thought process at the time was determined by the fact that the Prefect climbing and the Typhoons descending in close proximity was a higher risk of collision as both Mode C altitudes were known and they were on a converging heading. Whereas the aircraft transponding Mode A (NMC), was intermittent, stagnantly holding position, not manoeuvring aggressively towards and appeared to be a lower risk. Having to ensure that both parties (Typhoon and Prefect) received timely Traffic Information, they believed they cut short the opportunity to pass further Traffic Information to [the Typhoon formation pair] regarding the aircraft transponding Mode A (NMC).

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

THE CONINGSBY SUPERVISOR reports gliders were already known to be operating in the area, as about an hour before, departures were held on the ground for a glider operating close to the Coningsby

overhead. Radar was manned, with all radar seats bandboxed and traffic levels low. [The Typhoon formation pair] was prenoted from Swanwick, from the north for a visual recovery. The handover was conducted with the Radar controller identifying, setting the QNH and beginning descent. This was standard and followed a profile seen multiple times a day. As soon as the handover commenced, the Supervisor had 'FLARM up' to try and increase the Radar controller's situational awareness as there were at least three contacts to the north of Coningsby with no height displayed. Their attention was then diverted from FLARM when the Prefect pilot called requesting a climb into the block. The Prefect was identified, which was an obvious conflict with [the Typhoon formation pair] descending and the Prefect climbing with both heading towards each other. The Radar controller called the traffic and [the Typhoon formation pair] elected to stop at 5000ft. On hearing this transmission, the Supervisor instructed the Radar controller to stop the Prefect at 4000ft. Before they had had a chance to, the Prefect pilot called visual and adjusted their heading. With this conflict resolved the Supervisor's attention went back to FLARM to try and further assist the controller. With [the Typhoon formation pair] not showing on FLARM they were trying to cross reference their position on the radar screen to the contacts they were seeing on FLARM, to then ascertain at which altitude the gliders were, so further Traffic Information could be passed. Before they could get this to the Radar controller, [one of the Typhoon formation pair] had called 'glider'. Traffic Information was then passed to [the Typhoon formation pair] on that known contact, along with further contacts south of them. [The Typhoon formation pair] then continued their approach and recovered visually.

Factual Background

The weather at Coningsby was recorded as follows:

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METAR EGXC 291420Z 26012KT CAVOK 22/08 Q1017 NOSIG RMK BLU BLU=
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Analysis and Investigation

Military ATM

Utilising occurrence reports and information from the local investigations, 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. Screenshots are taken from Unit radar recordings and present the radar presentation of the Typhoon and LAK-19 available to the Coningsby Approach controller.

The Coningsby surveillance sensors in use consisted of both a non-cooperative radar and a cooperative system called Wide Area Multilateration (WAM). The WAM system consists of a series of networked nodes that are capable of detecting both standard Mode 3A/C/S outputs but also certain ADS-B outputs. Given the geographical layout of the WAM nodes, where an ADS-B output is detected the networked WAM system is able to determine its location through auto-triangulation between the nodes. This enables ADS-B outputs to be presented as part of the assured radar display irrespective of the ADS-B accuracy level. However, whilst the ADS-B output may contain vertical position, given the inability to assure the data source the vertical position is not displayed to controllers. An ADS-B only output detected by WAM is displayed as a box return with the data level top line an 'A' for ADS-B and the bottom line 'NMC' in line with other No Mode Charlie descriptions when vertical position is not available.

Sequence of Events

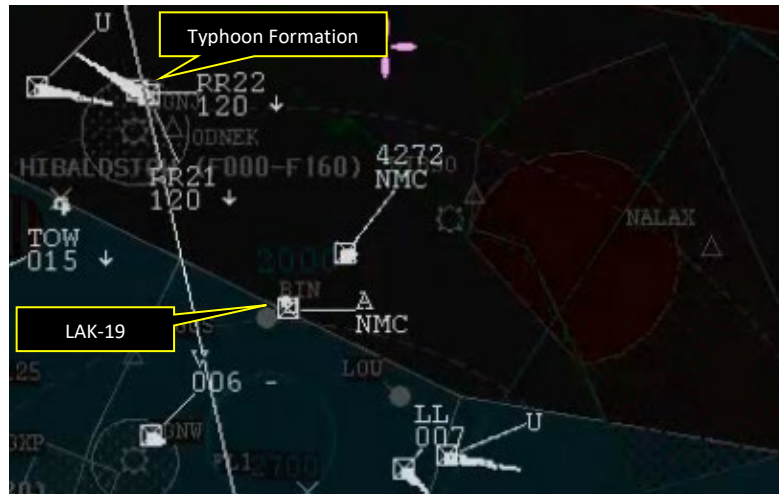


Figure 1 (1417:57). Typhoon formation checked in.

At 1417:57, the Typhoon formation level at FL120 contacted the Coningsby Approach controller requested a Traffic Service following a radar handover from Swanwick Military. The Coningsby Approach controller acknowledged FL120, issued a Traffic Service and then passed the Coningsby information Code for recovery.

At 1418:13, the Coningsby Approach controller confirmed the visual recovery intentions and passed the Coningsby QNH of 1017hPa.

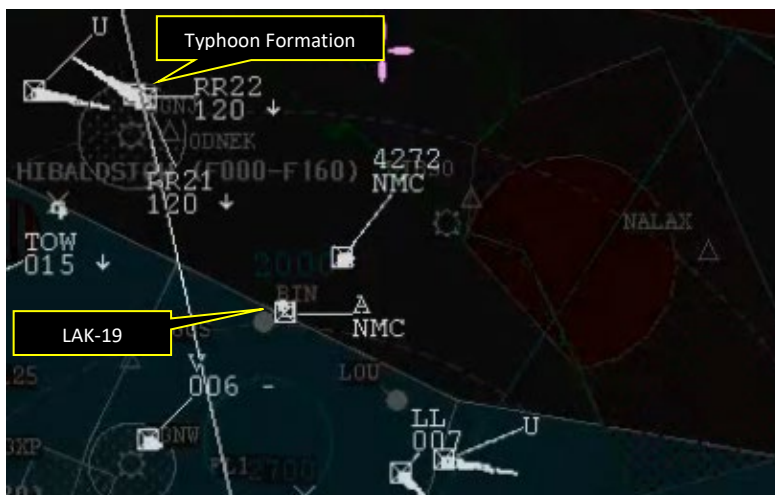


Figure 2 (1418:22). Typhoon formation cleared for Visual Recovery.

At 1418:22, the Coningsby Approach controller cleared the Typhoon formation “own navigation, taking your own terrain separation descent is approved, there’s no radar traffic to affect and the visual circuit is currently clear. Report aerodrome in sight”.

At 1418:47, a Prefect, on climbing from low-level, contacted the Coningsby Approach controller and requested a Traffic Service to operate in the altitude block 3000ft to 10,000ft on the Barnsley RPS 1012hPa. The Coningsby Approach controller identified the Prefect, issued a Traffic Service and then approved the altitude block.

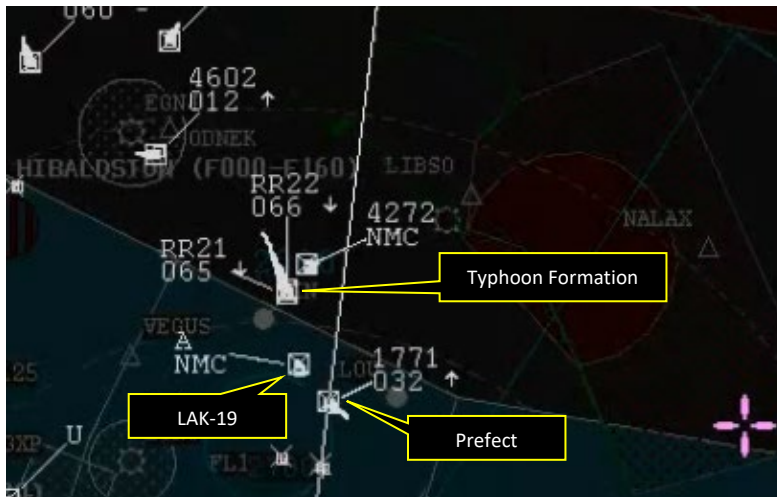


Figure 3 (1419:49). Typhoon formation provided Traffic Information.

At 1419:49, the Coningsby Approach controller provided the Typhoon formation with Traffic Information regarding the Prefect *“traffic, south-east, 3 miles, tracking north-west, indicating 3000ft and climbing a Prefect”*. The Typhoon formation acknowledged the Traffic Information, reported sensor contact³ and that they would not descend below 5000ft.

At 1420:03, the Coningsby Approach controller provided the Prefect pilot with Traffic Information regarding the Typhoon formation *“traffic north, 2 miles, tracking south-east, a pair of typhoons descending to altitude 5000ft this time, not yet visual with you”*. The Prefect pilot acknowledged the Traffic Information reporting *“traffic in sight, avoiding right”*.

At 1420:24, the Typhoon formation lead reported ‘Glider right’.



Figure 4 (1420:25). Reported CPA.

CPA occurred at approximately 1420:25 and reported as 100-200ft horizontal and 0ft vertical separation.

³ Enabled through use of onboard radar.

Local BM Investigation(s)

RAF Coningsby conducted a local investigation following the event to identify the ATS-related causal and aggravating factors. The investigation found that the Coningsby Approach controller had not provided the Typhoon formation with relevant Traffic Information regarding the glider. The lack of Traffic Information was as a result of two contributing factors; a prioritisation of providing Traffic Information regarding the known Prefect traffic and a lack of priority given to the ADS-B return given its lack of vertical information and slow speed. The investigation identified an aggravating factor in that the Coningsby Air Traffic Control team were aware of glider activity in the area and were utilising FLARM at the time of the Airprox, trying to correlate radar returns with FLARM information. This activity presented a potential distraction to the Coningsby Approach controller.

2 Gp BM Analysis

The lack of Traffic Information provision was fundamental to the Airprox occurring. Whilst presented as an ADS-B return, the LAK-19 also displayed relatively consistently on non-cooperative radar which should have indicated to the Coningsby Approach controller the significance of the radar return and prevented de-prioritisation. Whilst relevant Traffic Information was provided, the combination of the climbing Prefect and descending Typhoon formation through each other's levels significantly increased the work rate for both aircrew and the Coningsby Approach controller. Of note, the Coningsby Approach controller equally [did not] provide Traffic Information to the Typhoon formation prior to the Airprox regarding the 4272 Mode 3A aircraft with no height information. This may have been due to the ongoing utilisation of FLARM within the Approach Control Room to address the known glider traffic. Overall the Coningsby Approach controller [did not] provide Traffic Information regarding the LAK-19 which was clearly displayed.

UKAB Secretariat

The Typhoon formation and glider pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.⁴ If the incident geometry is considered as head-on or nearly so then both pilots were required to turn to the right.⁵ If the incident geometry is considered as overtaking then the LAK-19 pilot had right of way and the Typhoon pilot was required to keep out of the way of the other aircraft by altering course to the right.⁶

Coningsby Investigation

1417:54 - 1418:32

[The Typhoon formation pair] called [Coningsby] Radar who identified the formation, completed some admin and then gave [the Typhoon formation pair] own navigation and descent, taking their own terrain clearance.

Both [Coningsby] Radar and [Coningsby] Supervisor were endeavouring to correlate FLARM returns throughout with the radar picture; the [FLARM] console was displaced and diverted the attention of the controller. There were also background conversations about the glider activity that added a level of distraction.

For the duration of this timeframe there were 3 potential conflictors displayed. No Traffic Information was called to [the Typhoon formation pair].

- Conflictor One (unknown traffic) squawking 4272 no Mode C (NMC), 12 o'clock approximately 6-7NM.

⁴ (UK) SERA.3205 Proximity. MAA RA 2307 paragraphs 1 and 2.

⁵ (UK) SERA.3210 Right-of-way (c)(1) Approaching head-on. MAA RA 2307 paragraph 13.

⁶ (UK) SERA.3210 Right-of-way (c)(3) Overtaking. MAA RA 2307 paragraph 14.

- Conflictor 2 (unknown traffic) displaying ADS-B (A) NMC, right one o'clock approximately 8NM.
- Conflictor 3 (unknown traffic) squawking 7001 (low-level), right one o'clock approximately 12-15NM indicating 700ft on Mode C. This aircraft was a Prefect that subsequently called [Coningsby] Radar for a service.

1418:47

[Prefect pilot] called, climbing out of low level for a radar service whilst General Handling (GH).

1419:27

[Prefect] identified with positive observation of squawk change and put under a Traffic Service (TS).

Positions of Conflicting Traffic from [the Typhoon formation pair]:

- Conflictor One (unknown traffic) squawking 4272 NMC, left 11 o'clock approximately 2NM.
- Conflictor 2 (unknown traffic) squawking Mode A NMC, 12 o'clock 3-4NM.
- Conflictor 3 (known traffic) [the Prefect], under a Traffic Service and given the requested block for GH (as per tape transcript) and this in turn acknowledged by [the Prefect pilot].

1419:48

[The Prefect] was called to the [the Typhoon formation pair] who stated their intention to stop descent for vertical separation. Reciprocal Traffic Information was then passed to [the Prefect pilot] who reported visual with [the Typhoon formation pair] along with their intention to alter course to the right to build lateral separation.

Position of Conflicting Traffic from [the Typhoon formation pair]:

- Conflictor One (unknown traffic) squawking 4272 NMC, behind, no factor.
- Conflictor 2 (unknown traffic) squawking Mode A NMC, 12 o'clock approximately 2NM.
- Conflictor 3 [the Prefect] 12 o'clock approximately 3NM indicating 032 climbing.

1420:16

One element of [the Typhoon formation pair] called "Glider Right". It was assumed this was referring to Conflictor 2. [Although] there were a number of other returns displayed on both WAM and FLARM it was thought most likely [the call was based on Conflictor 2] based on interrogation of ADS-B and [information from internet-based flight tracking websites].

[Coningsby] Radar controller continued to call multiple unknown traffic returns until [the Typhoon formation pair] changed to [Coningsby] Tower.

The Investigation established the following outcome, cause and causal factors:

Outcome: Airprox between formation of 2 Typhoons and a civilian glider.

Cause: Controller had not called the conflicting traffic, that [was] believed to be the glider involved in the Airprox, to [the Typhoon formation pair].

Causal Factor 1.1: The controller prioritised the calling of known traffic to each other.

Causal Factor 1.2: The slow speed, lack of verified transponder information and initially intermittent return for the [Mode] A NMC [aircraft] led the controller to discount it as a significant factor. As it became more of an issue the priorities of the controller had shifted to calling known traffic.

Causal Factor 1.3: Both the controller and the Supervisor had been trying to correlate situational awareness information from FLARM to the returns seen on the radar. The FLARM picture was displaced one console from the controller and would have diverted their attention more so had it been closer. There were also conversations (not captured on the tapes) discussing the glider activity in the area and the need to potentially alter the types of recovery available to mitigate.

Comments

HQ Air Command

The investigation into this Airprox revealed that the information on potential glider traffic was available, but not passed to the Typhoon pilots. Clearly it would have helped if the gliders notified their presence on a LARS frequency, but they were available on FLARM and ADS-B, which gave some SA to ATC. Another solution could have been for the controller to pass a suggested heading to avoid potential traffic, or passed the potential for non-assured WAM tracks to be present such that the Typhoon [pilots] may have chosen to avoid the area. As it transpired, the Typhoon [pilots] were unaware of gliders, fixated on traffic info passed (the Prefect), and the presence of gliders was a surprise. Local training of RAF pilots and controllers has followed this occurrence regarding the characteristics of current ATC and aircraft systems vs gliders. Civilian airspace users are encouraged to use LARS, electronic conspicuity and understand the limitations on the military side through a combination of initiatives.

BGA

Just prior to the Airprox the LAK-19 pilot had been flying a constant track of 160° at a ground speed of 90-100kt for 3-4min, descending from 4800ft to 4100ft AMSL. The pilot then found a strong thermal (i.e. area of rising air), and at 1419:55 began a steep turn to the right to remain within its lateral boundaries. The glider's 20°/sec turn rate and ~100m turn radius imply a bank angle of at least 45°, and a climb rate peaking at 1000ft/min was achieved. After half a turn the glider was briefly head-on to the Typhoons at 1420:06, and it is presumably at about this time that the pilot first sighted them, although when head-on to distant observers the glider would itself have been difficult to see at that moment. Between 1420:06 and CPA at 1420:20 the glider pilot continued their well-banked, 100m radius climbing right turn, and their barometric logger indicated an altitude of 4650ft AMSL at CPA.

The Coningsby controllers are to be commended for their use of data from the EC system installed in almost all gliders to augment their situational awareness of non-transponding traffic. However, they were clearly hampered by not having access to a Flight Information Display (FID) that integrates glider EC and transponder returns on a single screen. Although the LAK-19 was not equipped with the generally-used glider EC system on this particular flight (the equipment was unserviceable, and had been removed from the aircraft for repair), it was broadcasting ADS-B (including barometric altitude) using a popular brand of carry-on low-power ADS-B transceiver (LPAT), and this has been confirmed by subsequent review of the glider's track at CPA via a commercial website. FIDs that integrate transponder, glider EC and ADS-B data in a single display in real-time are commercially available and in use at other ATSUs; the BGA would be happy to advise any unit that wishes to benefit from already-available, real-time EC data to enhance flight safety in this way.

Summary

An Airprox was reported when a Typhoon pair and a LAK-19 flew into proximity near Kelstern at 1420Z on Thursday 29th August 2024. Both pilots were operating under VFR in VMC, the Typhoon pair in receipt of a Traffic Service from the Coningsby Radar controller and the LAK-19 pilot not in receipt of a FIS.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, radar photographs/video recordings, GPS data, a report 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.

The Board first discussed the pilots' actions and was informed by a military aircrew member that the Typhoon formation had not expected the glider to be where it was and would have taken a different course had they known. By the time it had been sighted it was too late to take action, effectively a non-sighting (**CF9**). The LAK-19 pilot had seen the Typhoon formation at a late stage (**CF8**) which reduced the 'See-and-Avoid' barrier to partially effective. The LAK-19 pilot had assumed that the Typhoon formation had been aware of their presence, an assumption the Board felt was inadvisable, especially given that none of the pilots involved had had any situational awareness on the other aircraft before visual sighting (**CF7**). The military pilot member commented that the LAK-19 pilot's recollection of events had been contrary to the data established from radar replay (the Typhoon formation had been in a continuous descent and had not climbed as described) and had not appeared to react to their proximity, perhaps in the mistaken belief that they had seen the glider.

Turning to the controller's actions, members discussed the provision of Traffic Information and agreed that it had not been passed when required, both on the earlier '4272' traffic and on the LAK-19 (**CF1**, **CF3**). Their prioritisation of the Prefect had been the correct course of action once the Prefect pilot had called, but Traffic Information on the other traffic could have been passed before that point. The Board thought that this had perhaps been because the controller had been operating with an appreciable workload and had been distracted (**CF5**) by the effort of correlating the standalone FLARM display with their own radar display. In fact, although Wide Area Multilateration (WAM) had allowed the LAK-19 to have been displayed on the radar screen, albeit without altitude information (**CF6**), the radar screen symbology showed that it had also been displayed as a primary only contact, which the controller had not assimilated as a conflict (**CF4**). Military ATC members and advisors pointed out that although both controller and Supervisor were undoubtedly working with the safety of their aircraft uppermost in their minds, current RAF regulation prohibited the use of the standalone FLARM display by the controller (**CF1**) and that the Supervisor perhaps had had an opportunity to remind them as such (**CF2**) which in turn may have reduced the controller's workload and allowed them to pass Traffic Information on the LAK-19. Ironically, the LAK-19 FLARM had been unserviceable so it would not have appeared on the standalone FLARM display in any case.

Considering risk, members were cognisant of the large speed disparity between the aircraft and that although the LAK-19 pilot had seen the Typhoons at a reported range of 1NM, this represented an elapsed time of 10sec to CPA. The later-than-desirable visual sighting, separation of 0.25NM at CPA, lack of surveillance-derived Traffic Information and lack of EC warning persuaded the Board that safety had been much reduced, Risk B (**CF10**).

Board members also discussed the controller use of traffic information from unassured sources at considerable length. Although some members were of the opinion that such data should be used to provide essential additional information to pilots and controllers, ATC members pointed out that surveillance systems were approved to 'safety of life' standards, which precluded the use of data from unassured sources. Until a satisfactory safety case could be made for the use of unassured data, it simply could not be used. In short, the Board members were heartened by the depiction of WAM derived ADS-B location and lamented the fact that altitude could not also have been provided.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2024227			
CF	Factor	Description	ECCAIRS Amplification	UKAB Amplification
	Ground Elements			
	• Regulations, Processes, Procedures and Compliance			

1	Human Factors	• ATM Regulatory Deviation	An event involving a deviation from an Air Traffic Management Regulation.	Regulations and/or procedures not fully complied with
• Manning and Equipment				
2	Human Factors	• ATM Leadership and Supervision	An event related to the leadership and supervision of ATM activities.	
• Situational Awareness and Action				
3	Human Factors	• ANS Traffic Information Provision	Provision of ANS traffic information	TI not provided, inaccurate, inadequate, or late
4	Human Factors	• Conflict Detection - Not Detected	An event involving Air Navigation Services conflict not being detected.	
5	Human Factors	• Task Monitoring	Events involving an individual or a crew/team not appropriately monitoring their performance of a task	Controller engaged in other tasks
6	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				
7	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
• 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	Human Factors	• Monitoring of Other Aircraft	Events involving flight crew not fully monitoring another aircraft	Non-sighting or effectively a non-sighting by one or both pilots
• 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 Assessment⁷

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

Ground Elements:

Regulations, Processes, Procedures and Compliance were assessed as **partially effective** because Traffic Information on the LAK-19 had not been passed to the Typhoon formation and the Approach controller had been distracted by attempting to correlate contacts using the FLARM display

Situational Awareness of the Confliction and Action were assessed as **ineffective** because the LAK-19 radar return was generic in that its altitude was not depicted and the Coningsby controller did not act on it.

Flight Elements:

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because neither pilot had situational awareness on the other aircraft until sighted.

⁷ The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the [UKAB Website](#).

Electronic Warning System Operation and Compliance were assessed as **not present** because Typhoon is not fitted with a TAS and the LAK-19 pilot was not operating with a display for their TAS.

See and Avoid were assessed as **partially effective** because the Typhoon formation lead pilot had seen the LAK-19 too late to take action and the LAK-19 pilot had seen the Typhoon formation at a late stage.

Airprox Barrier Assessment: 2024227		Outside Controlled Airspace					
Barrier	Provision	Application	Effectiveness				
			Barrier Weighting				
			0%	5%	10%	15%	20%
Ground Element	Regulations, Processes, Procedures and Compliance	✓	⚠	[Yellow bar: 0% to 5%]			
	Manning & Equipment	✓	⚠	[Yellow bar: 0% to 2.5%]			
	Situational Awareness of the Conflicion & Action	⚠	✗	[Red 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	✓	✓	[Green bar: 0% to 10%]			
	Situational Awareness of the Conflicting Aircraft & Action	✗	✓	[Red bar: 0% to 20%]			
	Electronic Warning System Operation and Compliance	⊙	⊙	[Grey bar: 0% to 15%]			
	See & Avoid	⚠	⚠	[Yellow bar: 0% to 20%]			
Key:		<u>Full</u>	<u>Partial</u>	<u>None</u>	<u>Not Present/Not Assessable</u>	<u>Not Used</u>	
Provision	✓	⚠	✗	⊙			
Application	✓	⚠	✗	⊙	⊙		
Effectiveness	■	■	■	■	□		