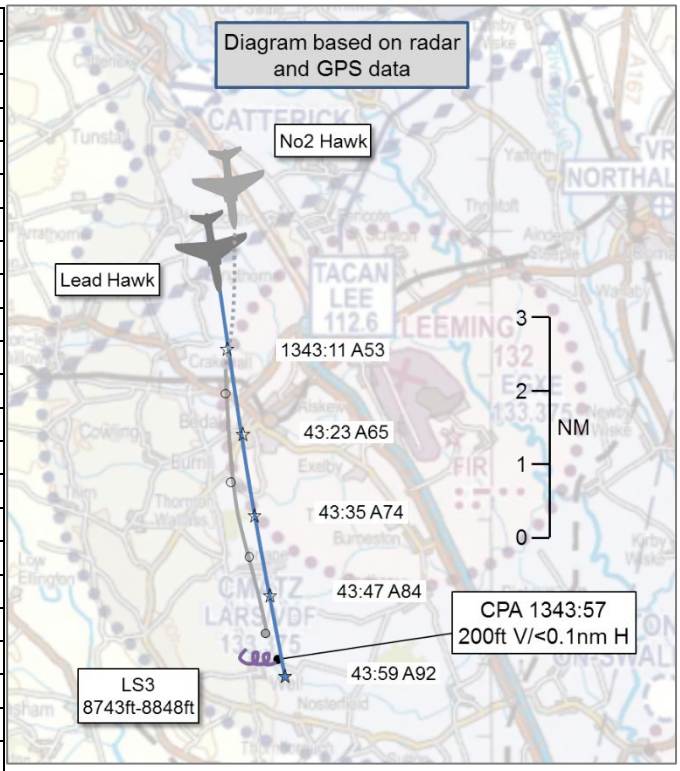
AIRPROX REPORT No 2018266

Date: 26 Sep 2018 Time: 1344Z Position: 5414N 00135W Location: 4nm SW RAF Leeming

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Lead Hawk	LS3
Operator	HQ Air (Ops)	Civ Gld
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	Traffic	Listening Out
Provider	Leeming	Durham
Altitude/FL	9000ft	~8800ft
Transponder	A, C, S	Not fitted
Reported		
Colours	Black	White
Lighting	NK	Not fitted
Conditions	VMC	VMC
Visibility	>10km	100km
Altitude/FL	FL085	8500ft
Altimeter	SPS	QNH (1028hPa)
Heading	180°	Turning
Speed	300kt	50kt
ACAS/TAS	Not fitted	FLARM
Alert	N/A	None
Separation		
Reported	<200ft V/0m H	Not seen
Recorded	200ft V/<0.1nm H	



THE HAWK PILOT reports that he was No2 in a formation of 2 Hawks on a 5-sec-stream formation departure from RAF Leeming. Shortly after getting airborne from RW34, the lead Hawk turned left onto a heading of 180º in a climb to FL190. The No2 Hawk pilot followed visually in fighting-wing[1] formation at a range of about 1500ft. He had just crossed from the left to the right side of the leader due to into-sun visibility when he saw a white glider and called for the leader to 'stay high glider below you'. The lead Hawk passed directly above the glider just as it started a left-hand turn. The No2 Hawk pilot rolled left slightly to maintain visual contact with the glider and it passed approximately 500ft below and to the east of his position. He declared an Airprox on the RAF Leeming Approach frequency. The sortie was curtailed due to the severity of the incident and, after burning fuel to an appropriate landing weight, both aircraft landed without further incident. The No2 pilot noted that the workload was high 2-3min after take-off, that the lead pilot did not see the glider, and that he was lucky to see the glider because it was just above a cloud layer on the horizon.

He assessed the risk of collision as 'Very High'.

THE LS3 PILOT reports that he was flying in mountain-lee-wave, operating generally between 7000ft and 11000ft, and routing from York to Brough in the Pennines. He was communicating with 3 other gliders on VHF who were at similar heights but to the south of his position. They were giving regular position reports to each other to maintain separation. With dual frequency, he was also maintaining a listening watch on the Durham Radar frequency because his route was approaching their extended runway in use (RW23) climb out zone. Whilst performing a series of left-hand circling turns, about 4nm to the southwest of Leeming at about 8500ft, he heard the sound of a passing jet. He was heads-up at the time but saw nothing until his heading came through about 020°, at which point he saw a second Hawk aircraft to the west of him. It was traveling at very high speed in a southerly direction and was

[1] Fighting-wing formation is a tactical formation where the subordinate element flies a few hundred feet offset behind the leader so that the leader can manoeuvre freely and the No2 follows these manoeuvres in turn.

visible for about 3sec prior to being abeam his position, about 200ft above and 150m horizontally. As it came past, the Hawk banked slightly towards him (left-wing low) which he interpreted as confirmation of visual contact. No avoiding action was required with the second aircraft. The glider pilot noted that the only confirmation of the first aircraft was the sound of it passing. He received no FLARM warnings and understood the Hawk was not fitted with FLARM.

He did not make an assessment of the risk of collision with the first Hawk.

THE LEEMING APPROACH CONTROLLER reports that the Hawk pair departed on a southerly track, climbing to FL190, to position for handover to Swanwick Central, for a POL-WAL CAS crossing. The formation was 6nm south of Leeming and had steadied on his heading of 180°, passing about 9000ft, when the lead Hawk pilot called an Airprox against a glider, reported 300ft below the formation. At no stage did the controller see a positive radar return which he could have believed to be a glider. It was only when the Supervisor zoomed his radar display into the 5nm range that the faintest of returns became visible. This return was shown on the FLARM display; however, because he had not seen any contacts in the corresponding position on his screen he did not ask the Supervisor to interrogate FLARM, iaw local procedures. He did subsequently call two contacts, both believed to be gliders, enhanced by FLARM derived information, well to the south of the Airprox position, before handing the formation to Swanwick (C) for their CAS transit.

THE LEEMING SUPERVISOR reports that the Approach controller informed him that the Hawk formation had reported an Airprox with a glider. The Supervisor was at his control position in the ACR, immediately donned his headset, and listened to the Approach frequency whilst simultaneously watching the radar display. He could see the primary and secondary returns for the Hawk pair but no conflictor that could have been the glider. He then interrogated the FLARM display (within a minute of the Airprox being declared) and saw a return that correlated with the reported height of the glider in the corresponding position. He did not know if FLARM was active on this glider prior to the Airprox. Subsequently, a faint primary radar return was displayed on his screen which then became intermittent. Once the Hawk formation had decided to continue en-route, the Approach controller handed them to Swanwick (Mil) Central and was relieved from his post in order to write up this DASOR.

Factual Background

The weather at Leeming was recorded as follows:

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METAR EGXE 261350Z 23010G21KT 9999 BKN013 17/14 Q1028 GRN TEMPO BKN016 WHT=
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The RAF Leeming Controller's Order Book contains an order relating to use of FLARM data, as follows:

> **Order No 50 – FLIGHT ALARM (FLARM)**
>
> 1. **Use of Flight Alarm (FLARM) derived data**. Gliders equipped with Flight Alarm (FLARM) can be viewed by ATC by way of a computer display within the Approach Control Room. The use of FLARM derived information for providing traffic information is severely restricted as the data derived cannot be fully assured therefore crews should not routinely request such information nor should controllers rely solely on it. The information derived from FLARM equipped air systems can only be used under the following conditions:
>
> a. If a definite risk of collision exists and the controllers believes the provision of FLARM derived altitude/height information would assist the pilot; the phrase 'FLARM indicates' will prefix any altitude/height information.
>
> b. The information should only be relayed to the controller via the ATC Supervisor/ATCO IC on request by the controller or when the ATC Supervisor/ATCO IC deems the information pertinent. This is to ensure that the controller is not distracted by monitoring a dislocated computer screen to the detriment of maintaining SA on the controlling air picture.

c. ATC Supervisors/ATCO ICs will receive bespoke instruction on interrogating the FLARM display and the limitations of use to ensure the information passed is deemed appropriate and / or necessary.

2. **FLARM Restrictions.** The following restrictions apply when utilising FLARM:

a. FLARM derived information is not to be used for the purposes of controlling, planning or offering altitude/height de-confliction advice to air systems.

b. FLARM derived information can only be used to supplement radar contact information displaying in primary only on the radar display where a definite risk of collision exists.

c. FLARM derived data should be given within 1 minute of the timestamp, if the timestamp exceeds 1 minute then controllers are to inform pilots of how old the information is.

d. Controllers are not to view / use the FLARM display when the Supervisor/ATCO IC is not in the ACR.

e. If doubt exists over the correlation of primary contact with the FLARM display the pilot is to be informed that FLARM information is unavailable.

f. De-confliction advice is to be provided based primary radar position only.

Analysis and Investigation

Military ATM

An Airprox occurred on 26 Sept 18 at approximately 1340UTC, 6nm south of RAF Leeming between a pair of Hawks and an LS3 glider. The Hawk formation was receiving a Traffic Service from Leeming Approach, the glider was not receiving an Air Traffic Service (ATS) but was maintaining a listening watch on both a glider frequency and Durham Tees Valley Approach.

Having been informed of the Airprox, the Leeming Approach Controller was not able to see the glider on radar although, some 40sec later, having decreased the range of his radar from 40nm to 5nm, the Supervisor was able to identify a faint radar return which was later identified as the LS3 following interrogation of FLARM.

This radar replay was conducted using NATS radars that are not utilised by RAF Leeming. The radar replay supplied did not show the incident. Analysis of the provided radar replay showed a primary radar return within 0.5nm of the reported Airprox position but this radar return disappeared some 1min 40sec prior to the incident taking place, whilst the aircraft are on diverging headings.

The Hawk formation was correctly identified and placed under an appropriate ATS. Both the controller involved, and the ATC Supervisor reported that no radar return was visible on the screen at the time of the incident and therefore no Traffic Information was passed. Given these facts, the actions of the controller involved were appropriate.

UKAB Secretariat

The Hawk and LS3 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 LS3[4]. If the incident geometry is considered as overtaking then the LS3 pilot had right of way and the Hawk pilot was required to keep out of the way of the other aircraft by altering course to the right[5].

[2] SERA.3205 Proximity. MAA RA 2307 paragraphs 1 and 2.
[3] SERA.3210 Right-of-way (c)(1) Approaching head-on. MAA RA 2307 paragraph 13.
[4] SERA.3210 Right-of-way (c)(2) Converging. MAA RA 2307 paragraph 12.
[5] SERA.3210 Right-of-way (c)(3) Overtaking. MAA RA 2307 paragraph 14.

Comments

HQ Air Command

This incident took place in Class G airspace above the RAF Leeming MATZ. Plan-to-avoid was unavailable in this encounter as neither pilot had – or could be expected to have had – information on the area of operation or routing of the other aircraft. The Hawks had selected an appropriate Air Traffic Service for the conditions (a Traffic Service) but the glider did not show on primary radar and therefore there was no reason for the controller to ask for the FLARM information to be interrogated. Therefore, the only viable barrier that existed in this encounter was see and avoid – gliders are notoriously difficult to detect visually and this led to the lead Hawk not seeing the glider and the second Hawk only spotting the glider at a late stage.

The glider pilot was entitled to operate in the area and was communicating with other gliders to ensure deconfliction. Assuming that these other gliders were FLARM equipped (thus providing an electronic conspicuity MAC barrier) he may have been better served to contact Leeming on his VHF radio, informing them of his position. He is to be applauded for the forethought of maintaining a listening watch on the Durham Approach frequency, but if ATC is not provided with position reports then it is highly unlikely that the controllers will be able to steer traffic around them.

The unit investigation has recommended that visits and presentations to local gliding clubs be conducted to increase awareness of how airfields and gliding clubs can best share the busy airspace in this area.

BGA

We commend the No2 Hawk pilot for his lookout, given that the glider would most likely have been very difficult to spot. We understand the constraints that the Leeming controllers are working under with FLARM and are most grateful that it is installed and can be used, but in this case it appears that there was sufficient information available to have avoided the airprox but for procedural reasons this did not happen, which is disappointing.

Summary

An Airprox was reported when a Hawk and a LS3 glider flew into proximity near Leeming at 1344hrs on Wednesday 26th September 2018. Both pilots were operating under VFR in VMC, the Hawk pilot in receipt of a Traffic Service from Leeming Approach and the LS3 pilot listening out on the Durham Tees Valley Radar 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 ATC and operating authorities.

Members first discussed the glider pilot's actions and, although he was commended for proactively listening out on the Durham ATSU frequency, members unanimously agreed that this did not provide a barrier of much substance. Whilst a listening watch could provide SA to a glider pilot, it would be much more productive to establish 2-way contact and inform the ATSU of their current position and planned intentions. A controller member felt it likely that, in this instance, a Durham controller may well then have informed Leeming of the glider's position, if they had felt that the glider was a factor to Leeming traffic. Other members felt that there was no imperative to contact a local ATSU whilst in wave at almost 9000ft, and that resolution to the conflict lay squarely with the regulations governing use of FLARM data in the Leeming ATSU. The Board acknowledged that this was a wider issue than just the Leeming ATSU, and discussed the use of FLARM data across ATC units.

The RAF ATC advisor stated that current regulations only permitted use of FLARM data under specific conditions, and that this was due to the unverified nature of the data. Simply put, it was not certified for

use in an ATC context, but could be used to support SA given prior information from a certified source (e.g. a primary radar contact). The advisor informed the Board that this was at least in part due to the uncertified nature of FLARM and the 'safety of life' requirements implicit in ATC systems providing Traffic Information to other traffic. Members accepted that the safety aspects of these ATC systems were such that adoption of new systems required a careful and measured approach. However, members pointed out a number of inconsistencies. The unknown degree of latency of FLARM displays was often cited as a factor against using FLARM data. Whilst this was certainly a factor with internet-hosted FLARM information, displays that were fed directly from FLARM receivers did not suffer to the same extent. Even with internet-hosted displays, FLARM data includes a time-stamp, which could be used to selectively display or occult FLARM traffic if desired, computed from the FLARM time-stamp and server/computer clock. Another example of inconsistency was the use of pilot position reporting as a means of passing Traffic Information to other traffic; a pilot's position report could be in error by a number of miles but this was still used by controllers to provide information to other pilots. Finally, members were also aware of local assessments by ATSUs comparing primary radar data with FLARM data and finding a level of correlation that was less than the position and latency boundaries of the radar system itself (such that the use of FLARM-derived data was actually providing a measure of primary radar accuracy). Ultimately, members unanimously agreed that the current situation was not acceptable. Although there may be good grounds not to use stand-alone FLARM data to provide SA for controlling purposes, it appeared at face-value that the data was compatible with overriding safety concerns and, given its widespread adoption by the gliding community and others, more specific use of FLARM by ATC should be considered. Consequently, the Board resolved to recommend that, 'The CAA and MAA review the regulations and procedures pertaining to ATC use of 'unassured data' such as FLARM for the provision of Traffic Information'.

Returning to the issue of the Airprox itself, members agreed that the cause had been that neither pilot saw the other aircraft. The discussion on risk resolved around the fact that although the vertical separation at CPA had been of the order of 200ft, the closing speed and variable nature of lift for the glider was such that a serious risk of collision had existed, where providence had played a major part in the aircraft not colliding.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by both pilots.

Degree of Risk: A.

Recommendations: The CAA and MAA review the regulations and procedures pertaining to ATC use of 'unassured data' such as FLARM for the provision of Traffic Information.

Safety Barrier Assessment[6]

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

ANSP:

Regulations, Processes, Procedures and Compliance were assessed as **partially effective** because the existing ATC FLARM procedures were considered sub-optimal.

Situational Awareness and Action were assessed as **ineffective** because the glider did not appear on radar and therefore the controller could not provide Traffic Information to the Hawk formation.

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

Flight Crew:

Tactical Planning was assessed as **partially effective** because the LS3 pilot did not notify Leeming or Durham Tees Valley of his location or intended route.

Situational Awareness and Action were assessed as **ineffective** because neither pilot was aware of the other aircraft.

Warning System Operation and Compliance were assessed as **ineffective** because the Hawks were not electronically compatible with the LS3's TAS (FLARM).

See and Avoid were assessed as **ineffective** because neither pilot saw the other aircraft.