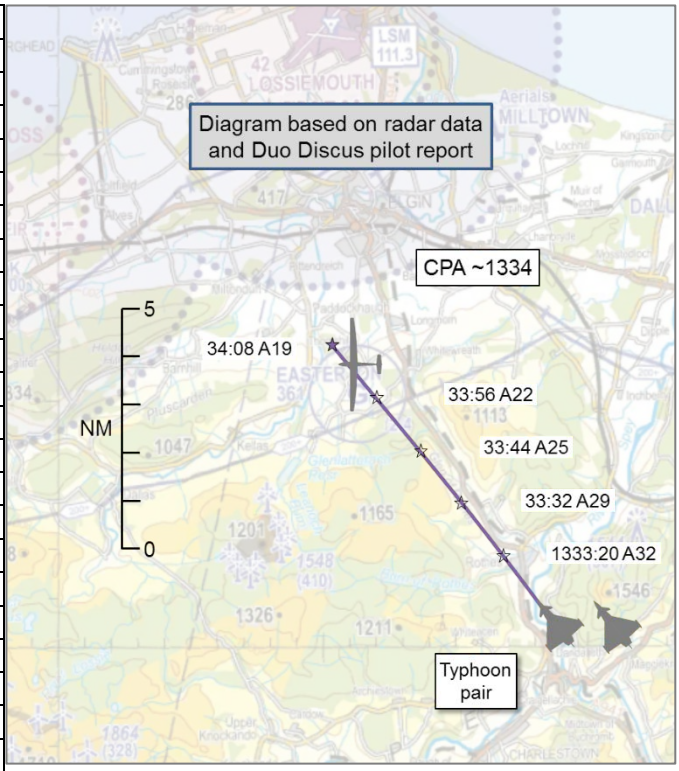
AIRPROX REPORT No 2019164

Date: 27 Jun 2019 Time: 1334Z Position: 5736N 00319W Location: 1NM NNW Easterton gliding site

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Duo-Discus	Typhoon pair
Operator	Civ Gld	HQ Air (Ops)
Airspace	Easterton Avoid	Easterton Avoid
Class	G	G
Rules	VFR	VFR
Service	None	Traffic
Provider	N/A	Lossiemouth
Altitude/FL	NK	NK
Transponder	Selected off	A, C (S off)
Reported		
Colours	White	Grey
Lighting	Not fitted	HISL, nav
Conditions	VMC	VMC
Visibility	30NM	NK
Altitude/FL	1800ft	2000ft
Altimeter	QFE (NK hPa)	QFE (1031hPa)
Heading	270°	310°
Speed	50kt	350kt
ACAS/TAS	FLARM	Not fitted
Alert	None	N/A
Separation		
Reported	200ft V/½NM H	100ft V/¾NM H
Recorded	NK	



THE DUO-DISCUS PILOT reports that he was in level flight heading west and pointing out landmarks to the passenger in the front seat. He spotted two Typhoon aircraft about 3/4nm mile away in close echelon formation, that crossed from left-to-right approximately 200ft below and, at their closest, approximately 1/2nm away. The Typhoons did not appear to change course and also appeared to be slowly descending. He watched them pass and then begin a change of course to the north towards what he would consider to be the RW05 extended centreline at RAF Lossiemouth. Although he spotted the two Typhoons approaching a short time before they crossed in front, there was no way for him to change course quickly enough to increase the separation at CPA. His only option would have been to descend rapidly but because they were already below he maintained heading and height and kept his eye on them. He was surprised to see them there and he was informed later from observers on the ground that they had flown through the Easterton airfield overhead. He had called RAF Lossiemouth ATC that morning by telephone and informed them the gliding site was active so he expected any military activity to keep well away from the vicinity.

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

THE TYPHOON PILOT reports that he was recovering to RAF Lossiemouth, following a 4hr transit from [abroad], when the formation came close to a glider at Easterton. The pair of Typhoons were recovering visually to RAF Lossiemouth from the southeast for RW05. The descent was conducted in VMC. Several contacts were called by ATC, and it was mentioned that Easterton was hot. New maps were ordered for the trail but most had failed to load to the aircraft, and there was no working map on recovery to which he could refer. One contact was called to the northeast and he incorrectly assumed that Easterton was north of their position as they approached Lossiemouth from the east-southeast. He asked if there was any other traffic to affect, to which ATC responded that there was a primary contact at Easterton. There were no contacts on his radar and, approaching the runway centreline, he switched the formation to Tower. At the same time he saw a glider, 2-3nm away in the 1 o'clock and level at

2000ft in a right-hand turn toward them. Although they were going to pass relatively close and level, he felt that there was no need for avoiding action and he called the traffic to the Tower controller. The remainder of the recovery was flown without incident. With hindsight, he felt he should have been more pro-active in asking ATC exactly where Easterton and the other traffic was with reference to their position/flightpath. Although he had been based at Lossiemouth for over a year, and had operated from Lossiemouth for about half that time and he had never seen Easterton hot.

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

THE LOSSIEMOUTH CONTROLLER reports that he was listening out on the frequencies of #4, #5, #8, #3, #19 and 123.3, with civil traffic departing Kinloss on #19. He had taken control of [the Typhoon formation] returning from overseas, who were to the northwest of the Aberdeen Zone, approximately 30nm from Lossie, and given initial descent instructions. The formation readback the instruction with a confirmation that they had the current ATIS information code. The airfield information included the statement of Easterton as 'hot'. The status of Easterton is only included if there is notified gliding activity. On asking for a visual recovery, he gave the formation own navigation and own descent, and deemed them safe enough for him to deal with a high workload on the VHF frequency of #19. Later, on completing the administrative calls to the formation, the Supervisor mentioned reminding them that Easterton was active, which he included alongside traffic information on a helicopter free-calling out of low-level. The formation were still under their own navigation and, as Lossiemouth was on RW05, he anticipated that they would turn further northwest to position for the runway in use and remain clear of Easterton. He therefore gave traffic information on primary contacts in the vicinity of known windfarms which would be on their route. The formation called visual with the aerodrome, requesting any other airfield traffic. He confirmed to them that there were no known aircraft to effect but that there was a small primary contact in the Easterton overhead, which he thought could have been a glider or a light-aircraft in the circuit. The Typhoon formation continued with the ADC and he heard from the Supervisor, who was listening into #2, that there had been a report of a glider. Their track seemed to take them a distance to the west of the primary contact; there was a definite gap between radar returns and the Mode C readout of the formation seemed consistent with them flying at 2000ft over the top of Easterton.

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

THE LOSSIEMOUTH SUPERVISOR reports that RW05 was in use in good VFR weather conditions. Easterton glider site had been active all day. A pair of station-based Typhoons recovered in receipt of the current ATIS code for a visual recovery. The radar controller was also providing a LARS service to aircraft on VHF. The Typhoons were confirmed to be station-based and warned into the VCR controller (SOP for all visitors and station-based aircraft which had not departed from Lossiemouth). The radar controller advised the aircraft again as they approached Easterton that the area was active, which was acknowledged. A strong primary contact indicating in the vicinity of Easterton was called to them, showing slightly right of their track. They called visual with Lossie and changed to Tower. The tracks did not merge. He did not hear them make the call to Tower of having seen a glider, but he heard the controller reiterate that Easterton was active. The lead Typhoon pilot rang and spoke to the radar controller, again he did not hear the pilot's words, but the controller told him afterwards that the pilot had reported some mapping issues. The Typhoon pilot rang later to ask to listen to the recordings and did so on Friday afternoon. He told me he would be submitting his own DASOR. The Supervisor understood that events had moved on and an Airprox had been filed by the glider pilot.

Factual Background

The weather at Lossiemouth was recorded as follows:

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EGQS 271320Z 07010KT 9999 FEW035 16/11 Q1032 NOSIG RMK BLU BLU
EGQS 271350Z 08010KT 9999 FEW035 16/10 Q1032 NOSIG RMK BLU BLU
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Analysis and Investigation

Military ATM

The glider was conducting a passenger flight and reported operating approx 1nm northwest of Easterton Glider Site at 1800ft when they became aware of 2 Typhoons in close formation. The glider pilot reported the Typhoons passed left-to-right, 200ft below at a range of ½nm. The Typhoons were returning to Lossiemouth from [abroad] and were conducting a visual recovery in receipt of a Traffic Service from Lossiemouth Approach.

During the recovery, the Typhoons were warned that Easterton Gliding Site was 'Hot' and, shortly before they were transferred to Lossiemouth Tower, they were passed generic Traffic Information on a primary radar return in the vicinity of Easterton. On joining the visual circuit, the Typhoons reported the presence of a glider (the Duo-Discus) at approx. 2000ft to the south of Elgin. The Lossiemouth Tower Controller confirmed that the aircraft had been informed that Easterton was active and advised that the glider was probably operating at Easterton.

The Lossiemouth Approach Controller informed the Typhoon Pilot that Easterton Gliding Site was hot and, prior to transferring the aircraft to Lossiemouth Tower passed Traffic Information on a non-transponding aircraft operating close to the Glider Site. Although the subsequent investigation ascertained that the Typhoon Pilot was not familiar with the location of Easterton, the Lossiemouth Approach Controller did not know this and therefore did not pass amplifying information.

UKAB Secretariat

The Duo-Discus and Typhoon pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard[1]. The Typhoon formation was required under military rules to avoid Easterton gliding site by 2000ft and 2nm.

When an aircraft carries a serviceable SSR transponder, the pilot shall operate the transponder at all times during flight, regardless of whether the aircraft is within or outside airspace where SSR is used for ATS purposes. Pilots shall not operate the IDENT feature unless requested by ATS. Except for flight in airspace designated by the competent authority for mandatory operation of transponder, aircraft without sufficient electrical power supply are exempted from the requirement to operate the transponder at all times[2]. Pilots of non-powered aircraft are also encouraged to operate the transponder during flight outside airspace where carriage and operation of SSR transponder is mandatory[3].

With respect to transponder usage, BGA advice states that: "Pilots are reminded that Standardised European Rules of the Air require that aircraft equipped with a serviceable transponder shall operate the transponder at all times during flight. Aircraft without sufficient electrical power supply are exempt from the requirement. If equipped with a transponder and an electrical charging system, it is in any case good practice to fly with the transponder turned on and with mode C selected."[4]

RAF Occurrence Safety Investigation (OSI)

The OSI centred upon interviews with the incident pilots, ATC Tower and Approach Controllers, information from the Inverness radar supplied by 11 Gp BM Safety A5, examination of ATC frequency transcripts, and examination of current guidance and orders.

The event was the infringement of the Easterton Gliding Site Avoid leading to an erosion of separation between [Typhoon formation] and the glider. The cause was that, [Typhoon formation Leader], was unaware of the position of the Easterton Gliding Site Avoid. The OSI Team identified

[1] SERA.3205 Proximity. MAA RA 2307 paragraphs 1 and 2.
[2] SERA.13001 Operation of an SSR transponder, para (a), (b) and (c).
[3] GM1 SERA.13001(c) Operation of an SSR transponder.
[4] British Gliding Association 'Transponder Use' dated 11th December 2017.

3 Causal Factors (CF) and made 1 observation. The CFs and observations attract a total of 5 recommendations.

CF: [Typhoon formation Leader] incorrectly believed Easterton Gliding Site Avoid was East or South-East of RAF Lossiemouth airfield.

Recommendations:

1. The FOB, Order 4, Annex D is amended to include clearer graphical representation of Local Flying Activity.

2. Typhoon Electronic Training Folder is amended to separate and formally record the Lossiemouth Wg Typhoon Pilot Brief and the RAF Lossiemouth Fixed Wg Brief.

3. Investigate the feasibility of having Easterton as a Tac Overlay.

4. ATC review the term "Easterton Hot", as it is now active dawn until dusk.

CF: [Typhoon formation Leader] had a working 1M map to refer to as he recovered to RAF Lossiemouth, but did not bump down to the 500K scale map. [Typhoon formation Leader] had lost confidence in the map package.

Recommendation: The functionality of Low and High Route selection is incorporated into the Typhoon Handling Manual.

CF: If the glider's IFF had been used, ATC would have been able to pass more information in the Traffic Service being provided to the Typhoons.

Recommendation: Engagement with the Easterton glider pilots to encourage the use of IFF transponders at all times, when fitted (as per British Gliding Association Rules).

The Chairperson commented as follows:

The OSI was convened to investigate the AIRPROX on the 27 Jun 19 between 2 Typhoon ac recovering to RAF Lossiemouth and a Duo-Discus glider operating in the Easterton Gliding Site Avoid. The ORG endorsed the OSI findings and agreed that the cause was that the lead pilot had an incorrect understanding of the location of the Easterton Gliding Site Avoid and flew through it, resulting in the erosion of safe separation with a glider operating within the area. The OSI was unable to fully determine why the pilot did not know the correct location of the Easterton Avoid, but highlighted various contributory factors and barriers which were not effective in correcting the pilot's incorrect mental model:

1. The lead pilot did not change the scale of the mapping form the 1M to the 500K scale map which displayed the Easterton Avoid due to the belief that the map system was faulty.

2. The information passed to the lead pilot that Easterton was "Hot" immediately followed by information on traffic outside the Easterton Avoid may have reinforced or contributed to the pilot's incorrect understanding of the location of Easterton.

3. Having confirmed with the pilot that he was station based, ATC assumed the pilot was aware of the Easterton Avoid and so, as is standard procedure, did not pass a range and bearing when informing the pilot of a primary contact within the Easterton Avoid.

4. Although fitted with a transponder, the glider did not have it switched on to preserve battery power for the radio.

The pilot had received the Wg Typhoon Pilot Brief and was current for the Flying Order book (FOB), both of which detail the Easterton Avoid. To avoid recurrence, the ORG endorsed the recommendation to review and update the Wg Typhoon Pilot Brief and FOB to increase clarity on Easterton Avoid. The recommendation to investigate including the Easterton Avoid as a Tac Overlay will also add an additional barrier against pilots not being aware of, or have an incorrect positional understanding of, the Easterton Avoid. Whilst the glider pilot was afforded protection from flying within the Easterton Avoid, British Glider Association Rules require gliders equipped with a transponder to have them switched on. [UKAB Note: In fact, BGA Rules reflect the requirements of

SERA.13001 and give advice regarding transponder use but they do not require a glider equipped with a transponder to have it switched on]. This would have provided additional traffic information for ATC to pass on to the pilot, which could have resulted in a different outcome. Engagement with Easterton has already taken place and the Easterton Chief Flying Instructor has agreed to reinforce the requirement to have transponders switched on when fitted.

Comments

HQ Air Command

The comprehensive Occurrence Safety Investigation carried out at RAF Lossiemouth identified that the Typhoon formation-lead had an incorrect understanding of the location of the Easterton Gliding Site avoid and flew through it, resulting in the Airprox with the Duo-Discus Glider. It could not determine exactly why the pilot did not know where the avoid was, but has made amendments to relevant orders, documents, R/T procedures and planning software to reduce the likelihood of a similar misunderstanding in the future. Clearly, having an appropriate map displayed in the cockpit would have helped. However, the Typhoon formation lead had suffered a loss of mapping earlier in the sortie, subsequently chose not to change the scaling of their maps and, as a result, did not have the relevant map displayed (showing the location of Easterton Glider Site) at the time of the Airprox. The functionality of the mapping system is under review as a result of this Airprox.

It is understood that the Duo-Discus Glider Pilot was not squawking to preserve battery power for their radio. Had it been, then the Typhoon formation lead might have been provided with a greater clarity of Traffic Information, including height, by the Lossiemouth controller. Engagement between RAF Lossiemouth and Easterton has taken place in order to attempt to have transponders turned on in Easterton Gliders when fitted.

The Lossiemouth controller reminded the Typhoon formation that Easterton Gliding Site was active and understandably assumed that the Typhoon formation knew the location. The controller was busy listening to multiple frequencies and prioritised passing the Typhoons pertinent Traffic Information. The fact that the Typhoon aircraft were operating under their own navigation might also explain why the controller was not specifically monitoring their routing. It is unfortunate that Traffic Information on the Glider was passed as “one primary contact in the vicinity of Easterton”. If this information was passed in clock-code format then improved SA would probably have resulted. Moreover, the Typhoon lead states that they should have been more pro-active in seeking clarification on the position of Easterton and conflicting traffic. Ultimately, lookout was the only barrier available to the avoidance of a collision. It is fortunate that the Typhoon formation lead spotted the Glider in enough time to monitor the situation and that no avoiding manoeuvre was deemed necessary by them.

BGA

It is most unfortunate that a technical failure combined with a faulty mental model on the part of the Typhoon pilot resulted in the pair flying close to an active gliding site that was well known to the local ATSU. BGA guidance follows the SERA 13001 rules regarding the use of transponders, and encourages their use whenever practicable.

Summary

An Airprox was reported when a Duo-Discus glider and a Typhoon formation pair flew into proximity near Easterton gliding site at 1334Z on Thursday 27th June 2019. Both pilots were operating under VFR in VMC, the Duo-Discus pilot not in receipt of a FIS and the Typhoon pilot in receipt of a Traffic Service from Lossiemouth Approach.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, radar photographs/video recordings, a report from the air traffic controller 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 rules and regulations regarding transponders and noted that, contrary to some of the comments in the RAF OSI, it was not a BGA requirement that transponder equipped gliders should have the transponder switched on. Rather, BGA only offered advice and encouragement in this area, reminding glider pilots of the requirements of SERA.13001 and noting that it was good practice to have the transponder selected on with Mode C. The Board agreed that this also gave glider pilots the flexibility to select the transponder off should available power be a concern. The BGA member commented that, in this incident, the glider in question had been operating all day and so the pilot was concerned that he should retain enough battery power to maintain the use of his radio. Whilst acknowledging that concern, members commented that fully charged batteries could have been made available at the launch point should a glider be making a number of shorter duration local flights; by doing so, weak batteries could be replaced, thereby maintaining power at a level that would not necessitate the transponder being selected off.

Members then discussed the Typhoon pilot's actions and agreed that he had not known the correct location of the Easterton Gliding Site, had consequently not made a plan to avoid it (**CF3**), and had thereby flown through it (**CF2**, **CF5**). It was disappointing that the reason for a Lossiemouth based pilot's lack of knowledge of a local avoid could not be determined, but the Board was heartened by the substantial mitigations introduced at Lossiemouth subsequent to this Airprox to ensure that this was rectified in future. Whilst the lack of transponder information from the glider (**CF4**) had resulted in the controller (**CF1**) and Typhoon pilot (**CF6**) only having generic SA, members felt that even if Mode C derived altitude had been available, it would probably not have changed the Typhoon pilot's decision making process, especially because the Typhoon had no TAS capability. Arguably, the presence of SSR on the radar display may have served to alert the controller to the impending conflict but the Board noted that he had anyway provided traffic information to the Typhoon pilot based on the glider's primary-only return. Furthermore, members noted that the Typhoon pilot had reported sighting the glider at a range of 2-3nm, and was not concerned by its proximity, and so it was not clear what else the Typhoon pilot would have done with any additional information.

With respect to the glider pilot, members discussed to what degree this Airprox was caused by concern as to the Typhoons flying inside the Easterton avoid rather than their proximity to and danger of collision with the Duo Discus. The BGA member reported that, in discussion with the glider pilot, he had expressed surprise that the Typhoons were in that location but was not concerned by their proximity. Consequently, the Board assessed that this event had been a sighting report as far as Airprox reporting was concerned (**CF8**).

Members commented that it was unfortunate that the Typhoon pilot had experienced a map malfunction and loss of confidence in its provision. Consequently, he had been operating at a map scale that did not depict the Easterton avoid. Members discussed to what degree his wingman should have alerted the Typhoon formation lead to the impending proximity of the Easterton avoid and wondered whether the arousal level of the formation pair was low after their medium-level transit.

Noting that the Typhoon is not equipped with a TAS, and that the Typhoon transponder was incompatible with the glider's FLARM (**CF7**), members went on to discuss the risk of collision. Although it was agreed that no risk of collision had existed, members felt that safety had been reduced because the Typhoon pilots had flown through airspace that they were required to avoid. As such, the Board reasoned that the event could not be allocated a risk Category E (normal procedures, safety standards and parameters pertained) and accordingly assessed the risk as Category C, (aircraft proximity in which no risk of collision has existed or risk was averted, but safety was reduced). Lastly, the Board fully supported the Easterton Chief Flying Instructor's advice to his glider pilots to have transponders switched on when fitted.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2019164		
CF	**Factor**	**Description**	**Amplification**
	Ground Elements		
	• Situational Awareness and Action		
1	Contextual	• Situational Awareness and Sensory Events	Generic, late, no or incorrect Situational Awareness
	Flight Elements		
	• Regulations, Processes, Procedures and Compliance		
2	Human Factors	• Flight Crew ATM Procedure Deviation	Regulations/procedures not complied with
	• Tactical Planning and Execution		
3	Human Factors	• Insufficient Decision/Plan	Inadequate plan adaption
4	Human Factors	• Transponder Selection and Usage	
5	Human Factors	• Aircraft Navigation	Flew through promulgated and active airspace or sporting site
	• Situational Awareness of the Conflicting Aircraft and Action		
6	Contextual	• Situational Awareness and Sensory Events	Generic, late, no or incorrect Situational Awareness
	• Electronic Warning System Operation and Compliance		
7	Technical	• ACAS/TCAS System Failure	Incompatible CWS equipment
	• See and Avoid		
8	Human Factors	• Monitoring of Other Aircraft	Sighting report

Degree of Risk: C.

Recommendation: Nil.

Safety Barrier Assessment[5]

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

Flight Elements:

Regulations, Processes, Procedures and Compliance were assessed as **ineffective** because the Typhoon formation flew through the military avoid at Easterton gliding site.

Tactical Planning and Execution was assessed as **partially effective** because the Typhoon lead pilot was not aware of the correct location of Easterton gliding site and therefore did not make a plan to avoid it.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **partially effective** because the Duo Discus transponder was selected off so only generic Traffic Information could be passed to the Typhoon pilot.

[5] 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 **ineffective** because Typhoon is not fitted with a TAS and the Typhoon transponder was not compatible with the Duo Discus FLARM.