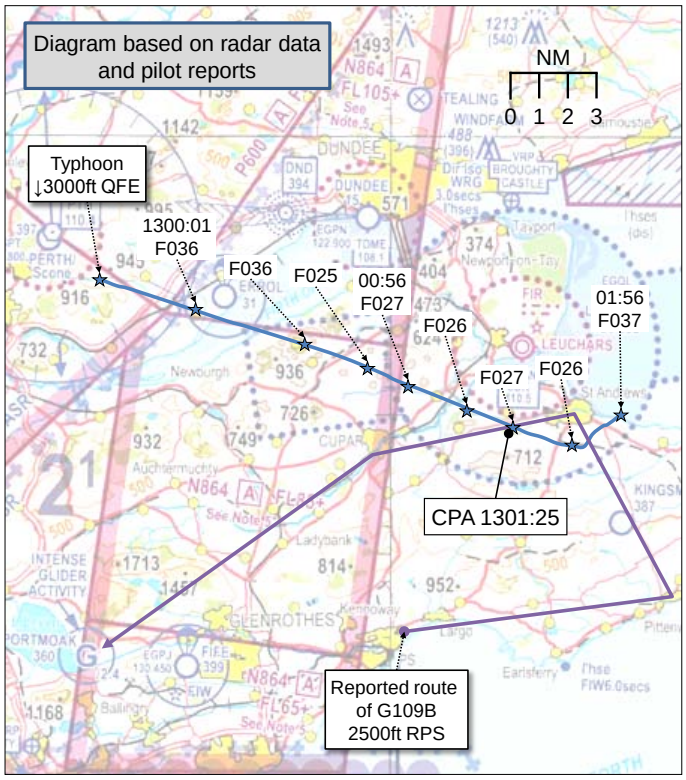
AIRPROX REPORT No 2013062

Date/Time:	26 Jun 2013 1301Z	
Position:	56 19N 002 51W (Approx 4nm S of RAF Leuchars)	
Airspace:	Leuchars MATZ	(*Class*: G)
	Reporting Ac	*Reported Ac*
Type:	Typhoon	Grob 109B (Motor-glider)
Operator:	HQ Air (Ops)	Civ Pte
Alt/FL:	3000ft QFE (1028hPa)	2500ft RPS (1025hPa)
Weather:	VMC CAVOK	VMC CLBC
Visibility:	10km	50km
Reported Separation:		
	400ft V/NR H	100ft V/200m H
Recorded Separation:		
	NR V/NR H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TYPHOON PILOT reports flying a visual recovery to Leuchars from the west, at 4000ft QFE and 480kts, receiving a Traffic Service from Leuchars Approach, who had informed him of an aircraft crossing the MATZ. He reported visual with the aerodrome at around 10nm, but was asked to remain on the approach frequency due to the MATZ crossing aircraft. The Approach Controller instructed him to maintain heading to position 5nm south of Leuchars, and the Typhoon pilot expected to 'flow behind' the north-bound MATZ crossing aircraft. Approach instructed him to descend to 3000ft and asked if he could see the Grob 109B (G109B); he replied that he could not and requested traffic information. Approach replied that the G109B was in his 12 o'clock at a range of 2nm. The Typhoon pilot then saw the motor-glider on a reciprocal heading and took avoiding action resulting in an estimated separation of 400ft as the other aircraft passed to his left-hand side.

He assessed the risk of collision as 'High'.

THE G109B PILOT reports flying in a level cruise at 2500ft on the RPS of 1025hPa, heading 260° at 85kts. The G109B is a white motor-glider which was operating VFR in receipt of a Basic Service from Leuchars Zone, routing Anstruther, St Andrews, passing south of Cupar en-route to Portmoak at 2500ft on the Tyne RPS of 1025hPa; the aircraft had strobe lights turned on but was not equipped with a transponder. He was following his planned route and contacted Leuchars Approach on passing the town of Leven. He was placed under a Basic Service and reported west-bound from St. Andrews. He reports that there was no apparent activity at Leuchars and he did not receive any information on local traffic. Shortly after passing south-abeam Leuchars, the pilot saw a Typhoon in his left, 11 o'clock, tracking down his left-hand side. He reported visual with the Typhoon and continued west-bound.

He assessed the risk of collision as 'Medium'.

THE ZONE CONTROLLER reports operating at 'medium intensity' with a number of aircraft receiving a service. The G109B pilot called and requested a Basic Service and MATZ transit, and informed the Zone Controller that his aircraft was not transponder equipped. The pilot planned to enter the MATZ from the south then route from St Andrews to Cupar then Fife Airfield. Zone instructed the pilot to fly

at 2500ft on the Tyne RPS(1025hPa) and then established a climb-out restriction, in accordance with SOPs, so that departing aircraft would not be above 2000ft. Zone decided to keep the G109B on the RPS as the 3hPa difference from the QFE of 1028hPa would provide an extra 90ft separation from any departing traffic. Zone informed the other control positions of the climb-out restriction but, on reflection, reports that he could have passed more information on the routing and pressure setting of the motor-glider. Zone recalls that he could see the Typhoon routing towards the general area of the motor-glider but he could see that the Typhoon's Mode C indicated slightly above the motor-glider's reported altitude and felt there was no risk of collision. The G109B pilot reported visual contact with the Typhoon and Zone reports, on reflection, that he could have provided more information to assist the Grob pilot's situational awareness.

He perceived the severity of the incident as 'Low'.

THE APPROACH CONTROLLER reports being 40 minutes in to 'a busy and complex recovery wave' when the traffic level dropped and only the Typhoon remained for recovery. When the Typhoon pilot contacted Approach, the controller provided a Traffic Service with the aircraft inbound to Leuchars for a visual approach. The pilot was instructed to descend in accordance with the radar vector chart and Approach noticed the Zone controller promulgating a climb-out restriction of 2000ft QFE against a MATZ crossing aircraft at 2500ft, on QFE he thought; the Approach controller reports that, when operating in the Zone position he routinely puts aircraft crossing the MATZ on QFE. He expected that the MATZ crosser would track from south-east to north-west and planned to route the Typhoon to the south to avoid the G109B. On realising that the G109B was going the turn to head west, Approach decided that the Typhoon's southerly routing would not be the most expeditious track but was still appropriate. The Typhoon pilot was instructed to descend to 3000ft QFE and was passed traffic information on the motor-glider at a range of 8-10nm. When the Typhoon pilot reported visual with the airfield, Approach asked if he was also visual with the motor-glider. The pilot requested the Grob's position and Approach, noticing that the Grob had faded from the radar picture, passed an estimated position, based on the radar trail, of 12 o'clock, 2nm, 500ft below. The Typhoon pilot reported visual contact with the motor-glider and was given clearance to contact Tower.

He perceived the severity of the incident as 'Low'.

THE ATC SUPERVISOR reports monitoring the Approach frequency and queried the southerly routing of the Typhoon. Approach explained that the route was against the MATZ crossing motor-glider; the Supervisor was satisfied with that plan and continued to monitor, noting that Approach passed traffic information on the Grob to the Typhoon pilot 'several times'.

Factual Background

The Leuchars weather at 1250 was:

METAR EGQL 261250Z 08005KT 9999 FEW038 SCT042 BKN250 16/06 Q1029 BLU NOSIG

This Airprox occurred approx 4nm south of RAF Leuchars at approx 1301:34 on 26 Jun 13, between a Typhoon and a G109B. The Typhoon was operating VFR conducting a visual recovery to Leuchars Rwy 26RH, in receipt of a reduced Traffic Service from Leuchars Approach, with transponder modes A, C and S turned on.

The Approach control position was manned by a trainee and OJTI mentor team.

Analysis and Investigation

Military ATM Analysis

Figure 1 depicts the approximate route of the motor glider, starting from the point at which it first called Zone.

All heights/altitudes quoted are based upon SSR Mode C from the radar replay unless otherwise stated; however, the G109B passed outside NATS radar coverage at 1259:19, prior to the CPA.

Both pilots reported VMC with the Typhoon pilot reporting BKN cloud at 6000ft. Approach was manned by a trainee and an instructor who reported their workload as medium to low and the task complexity at the time as 'medium'. The trainee and instructor had been on console for approx one hour, and the incident Typhoon was the only ac on frequency, and the last ac of what the trainee considered to be a 'busy and complex recovery wave'. Zone was operating in the band-boxed Departures/Zone position, a standard configuration for Leuchars ATC, and reported providing Air Traffic Services to multiple aircraft with a moderate workload.

The incident sequence commenced at 1257:16 as the Typhoon made initial contact with Approach, was identified and provided with a Traffic Service, reduced as the Watchman was 'limited awaiting a flight check'. At this point, the Typhoon was 35nm west of Leuchars, tracking north-easterly, indicating descent through FL148; a primary contact believed to be the G109B was 5.3nm south-east of Leuchars, tracking northerly at 2500ft on the Tyne RPS of 1024hPa, changing to 1025hPa at 1258:20. It is worthy of note that the G109B had not been identified by Zone and the radar return that Zone believed to be the G109B was intermittent throughout the incident sequence.

At 1259:07, Approach advised the Typhoon that they were going to "*vector* [them] *to the south, we've got one MATZ crosser routing south-east to north-west*." Both the Approach instructor and trainee reported that they made an assumption of the G109B's routing through the MATZ based

on previous experience, a 'brief talk with zone and from looking at his flt strip'. No formal landline liaison between Zone and the other radar positions was recorded. Moreover, although when Zone advised Ground of the MATZ Crosser they made reference to the pressure setting that the G109B was operating on, based on the report from Approach, it appears that the liaison within the Approach Control Room did not include this information. Approach then assumed that the G109B was operating on the QFE based on their experience of operating in the Zone control position.

Although MMATM Chapter 25 Paras 6-8 discusses a MATZ Penetration Service, it does not stipulate whether aircraft crossing the MATZ should be placed onto the aerodrome QFE but does make reference to 'the altitude at which aircraft are permitted to cross the MATZ'. That said, CAP 413 Chapter 10 Para 3.32 provides examples of phraseology which refer to the use of QFE and CAP 413 Chapter 11 1.3.6 Figure 29 Note 3 states that 'Military units employ QFE in the circuit area, the instrument pattern and for MATZ penetration'.

At 1259:58, the Typhoon advised Approach that they were "*visual with field, confirm position of the MATZ crosser.*" At this point the Typhoon was 12.4nm west of Leuchars, heading 110° at 4000ft QFE; the G109B had passed outside NATS radar coverage at 1259:19, 4nm south-east of Leuchars, tracking northerly. Approach replied to the Typhoon, "*MATZ crosser is err believed to be 12 o'clock, 10 miles, opposite direction at 2500ft*" which was acknowledged. Approach's inclusion of the phrase "*believed to be*" was arguably as a result of knowing that the G109B had not been identified by Zone. Approach's description of the G109B's relative direction as "*opposite direction*" suggests that the G109B had adopted a westerly track en-route Portmoak. Approach then descended the Typhoon to 3000ft QFE which was acknowledged. Given the 3hPa difference between the Leuchars QFE (1028hPa) and the Tyne RPS (1025hPa), the G109B was at 2590ft and thus 410ft vertical separation existed between them and the Typhoon, rather than the 500ft that Approach believed.

Based upon Approach's report, at some point after 1259:07, the Supervisor advised them that the G109B was 'not crossing the MATZ but turning at St Andrews' en-route to Portmoak. Both the trainee and instructor considered that their plan was still workable, given the 'good visibility reported' and the separation that they believed existed between the Typhoon and the G109B; however, they did not update the Typhoon on the routing of the MATZ crosser, having previously advised them of the south-east to north-west track.

At 1300:44, the Typhoon advised Approach that they were "*happy to switch to Tower, I'll maintain 3000ft.*" Approach instructed the Typhoon to "*maintain this*" as they were conscious that the Typhoon had not reported visual with the G109B. After a brief exchange of R/T where Approach was asked to repeat his instruction, at 1301:20, Approach asked the Typhoon "*are you visual with the MATZ crosser?*" At this point, the Typhoon was 2.7nm south-south-west of Leuchars, heading 115° at 3000ft QFE. The Typhoon's pilot replied "*negative, request position*" and Approach advised them that they were "*unsure of position, he's dropped off radar, believed to be 12 o'clock, 2 miles…1 mile, opposite direction*." The Typhoon pilot immediately advised Approach that they were "*visual glider*." 4 seconds later at 1301:38, the G109B pilot advised Zone that they were "*westbound, visual with the Typhoon*"; Zone did not provide a warning on the Typhoon to the G109B pilot as he 'could see that the Typhoon was indicating slightly above my aircraft and that there was no risk of collision' and, arguably, they were aware that Approach had descended the Typhoon to 3000ft QFE.

The guidance material to CAP 774 Chapter 3 Para 6 states that under a Traffic Service, 'when providing headings/levels for the purpose of positioning and/or sequencing or as navigational assistance, the controller should take into account traffic in the immediate vicinity, so that a risk of collision is not knowingly introduced by the instructions passed. However, the controller is not required to achieve defined deconfliction minima'.

CAP 774 Chapter 2 Para 5 states that 'a controller with access to surveillance-derived information shall avoid the routine provision of traffic information on specific aircraft [to ac in receipt of a Basic Service], and a pilot who considers that he requires such a regular flow of specific traffic

information shall request a Traffic Service. However, if a controller/FISO considers that a definite risk of collision exists, a warning may be issued to the pilot'.

The Typhoon pilot reported visually acquiring the G109B at a slant range of 3000ft (approx 0.5nm) 400ft below, which accords with the actual vertical separation of around 410ft; the G109B pilot reported acquiring the Typhoon at 0.5nm, with a minimum reported separation of 100ft vertical and 200m horizontal.

It was pleasing to note that Approach had exhibited elements of defensive controlling in deconflicting the Typhoon and the G109B and ensured that there was no risk of a collision; however, by assuming that the G109B was operating on QFE, the separation that they imposed was 410ft, rather than 500ft. Moreover, whilst their assumption of the radar identity of the G109B was proven with hindsight, Approach was deconflicting the Typhoon from what they assumed to be the G109B. It is also reasonable to argue that had Approach re-iterated the altitude of the G109B in their updated Traffic Information to the Typhoon at 1301:26, this may have ameliorated the Typhoon pilot's concern over the conflict.

Comments

HQ Air Command Comment

HQ Air Command agrees with the ATM analysis, particularly the role played by Approach in providing a degree of collision avoidance assistance by providing a degree of vertical separation through their descent instructions. However, having not sighted the MATZ crosser the Typhoon pilot also made a crucial decision to maintain that height when he might have inferred it was clearing to the North from Approach's initial call. Retaining the Typhoon on frequency was also commendable and ultimately ensured the existing separation was maintained.

Summary

An Airprox occurred approx 4nm S of RAF Leuchars between 1301 and 1302 on 26 Jun 13, between a Typhoon and a G109B within the MATZ but outside the ATZ. The Typhoon was operating VFR conducting a visual recovery to Leuchars RW26RH, at 3000ft QFE (1028hPa), in receipt of a reduced Traffic Service from Leuchars Approach. The G109B was operating VFR in receipt of a Basic Service from Leuchars Zone, routing Anstruther, St Andrews, passing south of Cupar en-route to Portmoak at 2500ft Tyne RPS (1025hPa) and was not equipped with a transponder and the aircraft had not been identified on radar. Estimated vertical separation of 410ft existed between the aircraft. Both aircraft were in Class G airspace, both pilots had equal collision avoidance responsibility and, if approaching head on and there was a danger of collision, were required to alter course to the right.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available to the Board consisted of the reports from both pilots, the air traffic controllers, the RT transcripts and the radar recordings.

The Board noted that although there had been some areas of concern in this occurrence, there were also some very positive aspects; specifically, the G109B pilot had elected to call ATC for a MATZ crossing service when he was not obliged to, and Approach had exhibited sound defensive controlling by keeping the Typhoon on frequency and planning to route the aircraft to the south at a height that they thought would be 500ft above the G109B. It was agreed that, in this case, the controllers' assumptions on pressure settings had not materially affected the sequence of events but this could have led to a far worse outcome in other circumstances; the Board therefore recommended that RAF Leuchars ATC should review its altimeter setting procedure for MATZ-crossing aircraft. Discussion turned to the degree of co-operation between the controllers and it was agreed that this aspect had not been effective in preventing the occurrence; the Board recommended that RAF Leuchars ATC Leuchars should review the coordination procedure and responsibilities for controlling MATZ crossing aircraft.

Some Board members were surprised that the Typhoon pilot had not seen the G109B on his aircraft's radar and noted that, in the absence of TCAS/ACAS, radar was one of the Typhoon Force's primary mitigations against mid-air collision. One of the Fast-Jet pilot members informed the Board that there are many reasons why the radar may not have detected the G109B, including the difficulty of detecting small radar cross-section aircraft. It was also noted that, in this case, TCAS would not have been effective either because the G109B was not squawking.

When assessing the Risk the Board noted that the separation achieved by ATC was likely to have been in excess of 400ft, which is not uncommon in Class G airspace. They also noted that the Typhoon pilot, despite being surprised by the appearance of the Grob109B, had been able to take effective horizontal avoiding action. They therefore agreed that there was no risk of collision and graded the event as a sighting report.

The safety barriers[1] pertinent to this Airprox were: 'ATC rules and procedures', 'controller action', 'aircrew rules and procedures', 'visual sighting', 'aircrew action', 'situational awareness from RT', and SA from on-board systems'. The Board concluded that, as the Typhoon pilot had seen and avoided the Grob109B and ATC had provided vertical separation, overall the barriers had been 'effective'; the total number of POB was 2 so an Event Risk Classification score of 2 was allocated.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report.

Contributory Factors:

1. Lack of coordination and TI from ATC.

2. The Grob was using QNH and the Typhoon was using QFE.

Degree of Risk: C.

ERC Score: 2.

Recommendations:

1. RAF Leuchars ATC should review the coordination procedure and responsibilities for controlling MATZ crossing aircraft.

2. RAF Leuchars ATC should review the altimeter setting procedure for MATZ-crossing aircraft.

[1] Although the Event Risk Classification (ERC) trial had been formally terminated for future development at the time of the Board, for data continuity and consistency purposes, Director UKAB and the UKAB Secretariat provided a shadow assessment of ERC.