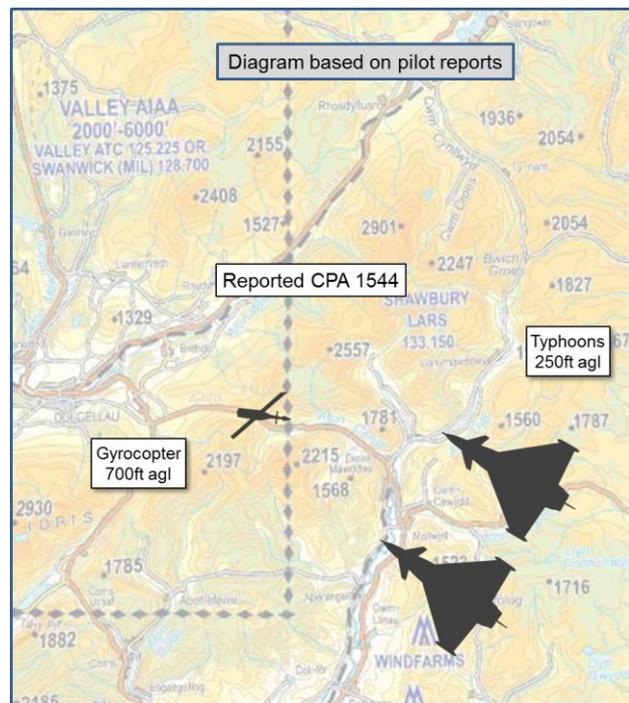


**AIRPROX REPORT No 2014167****Date/Time:** 9 Sep 2014 1544Z**Position:** 5244N 00346W  
(4nm E Dolgellau)**Airspace:** London FIR (Class: G)**Aircraft 1**                      **Aircraft 2****Type:** Typhoon                      Gyroplane**Operator:** HQ Air (Ops)              Civ Pte**Alt/FL:** 250ft                      700ft  
RPS (1016hPa)                      agl**Conditions:** VMC                      VMC**Visibility:** 10km                      20km**Reported Separation:**

350ft V/0ft H                      200ft V/0ft H

**Recorded Separation:** NK**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

**THE TYPHOON PILOT** reports flying in a formation of two grey aircraft. His transponder was selected on with Modes 3A, C and S, but neither aircraft was fitted with a TCAS. The formation was originally planned to conduct medium-level training in the North Wales MTA but, due to equipment unserviceabilities, this was changed and LFA 7 was booked instead. After some intercept work with Swanwick(Mil) providing a Traffic Service, the pair terminated their ATS and descended low-level, announcing their intentions on the UK military low-level frequency. After approximately 5 minutes of flying low-level, and whilst passing through the Bwlch Oerddrws, both pilots saw a Gyrocopter less than 1nm ahead. Subsequent examination of the topography suggests that it would not have been visible before this point. Due to the valley sides the formation could not manoeuvre laterally to increase separation, and the position of the Gyrocopter above them precluded a climb, and so they passed beneath it with an estimated 350ft separation. They then broadcast its position on the low-level frequency to warn others of its presence and reported the Airprox to Swanwick(Mil) on exiting the low-level system 10 minutes later.

He assessed the risk of collision as 'Medium'.

**THE GYROPLANE PILOT** reports flying a red aircraft with strobes and navigation lights illuminated. The transponder was selected on with Modes 3A, C and S. The aircraft was not fitted with TCAS. Although he was not receiving an ATS, he was listening out on the Welshpool frequency. He was on a cross country exercise and was following a narrow valley on the edge of the Valley AIAA, near to Dolgellau. He instructed the student to climb to approx 700ft agl to maintain a safe height. Just as they levelled he heard, then saw, two Typhoon fighters pass below; they manoeuvred left then right as if to indicate that they had seen him. Although the Gyroplane had good visibility to the left, right and in front, it was difficult to see behind, and they saw the Typhoons too late to take any avoiding action. Slightly shaken by the sudden event, they immediately returned to their aerodrome.

He assessed the risk of collision as 'Low'.

**Factual Background**

The weather at Valley was recorded as:

METAR EGOV 091550Z 33010KT 9999 FEW023 17/11 Q1021 BLU NOSIG

## Analysis and Investigation

### UKAB Secretariat

Both pilots shared an equal responsibility for collision avoidance and for not flying into such proximity as to create a danger of collision<sup>1</sup>. The Typhoons were overtaking and, ordinarily they were required to keep out of the way of the Gyrocopter by altering course to the right<sup>2</sup>; however, terrain proximity prevented this and the Typhoons had to avoid the Gyrocopter with the only option available to them by flying beneath.

## Comments

### HQ Air Command

This incident occurred within the area flow system of the Machynlleth loop; the UK(Mil) Low Flying Handbook (UKMLFHB) states that Military aircraft flying in the valleys that constitute the Machynlleth loop should fly in an anti-clockwise direction only. The flight profile of the Typhoon formation, coupled with the geographic constraints of the valley, created the conditions in which the Typhoon pilots were unable to comply with the rules of the air when overtaking the gyrocopter. Additionally, due to relative positions of the Typhoon aircraft on visual acquisition of the gyrocopter, a safe climb to avoid the conflict was not possible. As a result, the Typhoon pilots took the only safe option to avoid collision and flew beneath the gyrocopter at the largest available separation distance.

Although neither of the Typhoon aircraft were fitted with a TCAS, it is unlikely that the use of this equipment would have prevented this occurrence due to the restricted line-of-sight encountered by the Typhoon crews when operating at low level in mountainous terrain.

## Summary

An Airprox was reported on 9<sup>th</sup> September 2014 at 1544z when a pair of Typhoons flew into proximity with a Gyrocopter. The Typhoons were in LFA 7 and listening out on the low-level frequency, the Gyrocopter pilot was on Welshpool's frequency, neither aircraft was receiving an ATS. The incident was too low to show on the NATS radar, so the exact separation is not known.

## **PART B: SUMMARY OF THE BOARD'S DISCUSSIONS**

Information available consisted of reports from the pilots of both aircraft and reports from the appropriate operating authority.

The Board first looked at the actions of the pilots. The Board noted that the Typhoons were flying low-level within the confines of a valley, too low to receive an ATS, and in terrain that would probably have rendered their on-board radars ineffective in detecting the Gyrocopter until the last moment: see-and-avoid was their only defensive measure in the circumstances, and the Board agreed that, due to the terrain, they were unable to see the Gyrocopter any earlier. The Board recognised that, under the circumstances and closure rates, the Typhoon pilots had few options other than to fly beneath the Gyrocopter. The Board then turned to the actions of the Gyrocopter pilot. Again, it was recognised that he could not have seen the Typhoons any earlier because they had approached from behind and up the valley; the Board concluded that, given the closure rates, he had few options available, especially since he did not see the Typhoons until they were upon him.

The Board then debated the circumstances more generally and, noting that the airspace was Class G where all the pilots were entitled to fly, they wondered whether the GA community were aware of the significance of this particular valley regarding military low-flying. Had the Gyrocopter pilot been

<sup>1</sup> Rules of the Air 2007 (as amended), Rule 8 (Avoiding aerial collisions).

<sup>2</sup> Ibid., Rule 11 (Overtaking).

aware of the nature of potential fast-jet flying in the valley, they wondered whether he would have chosen to use it. Known as the 'Machynlleth Loop' the valley concerned is a one-way loop in the military low-flying system that is regularly used by military fast-jets for terrain flying training, and is marked one-way with flow arrows because of the difficulties in maintaining see-and-avoid criteria due to terrain obscuration. The Board were informed that the loop is marked with flow arrows only on military charts. Some members opined that GA pilots should expect to encounter military low-flying below 2000ft in any mountainous terrain and that flow arrows were therefore irrelevant; others noted that flow arrows were indicative of choke points which reflected more than usual low-flying activity. There followed some discussion about whether flow arrows should be marked on civil aviation charts, and some members of the Board recalled that this had been the subject of other Airprox discussions. Whilst it was accepted that flow arrows introduced clutter to already busy charts, the Board felt that the significance of this particular valley was great enough to warrant some form of warning. The Board then discussed the best way to highlight the issue to GA pilots, and resolved to recommend that HQ Air Command reviews GA education with regard to flow arrows in general, and the Machynlleth Loop in particular, to see whether there was value in providing some form of depiction on civil aviation charts.

In discussing the cause of the incident, the Board quickly agreed that this had been a simple conflict in Class G; that the risk was assessed as Category C; the Typhoon pilots had taken timely and effective action.

### **PART C: ASSESSMENT OF CAUSE AND RISK**

<u>Cause:</u>	A conflict in Class G airspace.
<u>Degree of Risk:</u>	C.
<u>ERC Score</u> <sup>3</sup> :	20.
<u>Recommendation(s):</u>	HQ Air Command reviews GA education with regard to flow arrows.

---

<sup>3</sup> 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.