

AIRPROX REPORT No 2014003

Date/Time: 14 Jan 2014 1530Z

Position: 5237N 00238W
(10 nm s of RAF Shawbury)

Airspace: Shawbury AIAA (Class: G)

Aircraft 1 Aircraft 2

Type: Squirrel Europa

Operator: HQ AAC Civ Pte

Alt/FL: 3000ft 3300ft
QFE (999hPa) QNH (1004hPa)

Conditions: VMC VMC

Visibility: 10km 10km

Reported Separation:

0ft V/100yds H NR

Recorded Separation:

100ft V/0.2nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SQUIRREL PILOT reports flying a black and yellow helicopter with all lights on and squawking transponder Modes 3/A, C and S. He had conducted a Standard Instrument Departure from Shawbury to 'Box C'¹, was in receipt of a Traffic Service from Shawbury Approach, and was operating with the IF screens in place. As the aircraft levelled at 3000ft, the controller called possible traffic in his 12 o'clock; although not visual, the Squirrel's TAS sentinel screen indicated traffic at 7nm. He did not want to take avoiding action at this stage due to the "arc of error" on the TAS, it is known to give inaccurate bearings and he did not want to manoeuvre away from the contact in case he put the conflicting traffic beneath the aircraft and therefore out of his field of vision. Further updates were given by ATC but visual contact could not be made, TAS gave an audio alert but then the "blip" disappeared from the screen. At that point the pilot thought he heard a transmission that reported the contact had gone, he then saw a blue (he believed) and white, single-engine, light civilian aircraft pass down the right-hand side of his aircraft at a range of 100yds; there was no time to take avoiding action. Once the traffic had passed, ATC reported that the traffic was again showing on radar, now in the 6 o'clock position.

He assessed the risk of collision as 'High'.

THE EUROPA PILOT reports flying a green and white aircraft with transponder Mode 3A, C and S selected: he did not report which lights were illuminated, and the aircraft was not fitted with a collision avoidance system. He reports flying at 3300ft and receiving a Basic Service from Shawbury Zone. After entering the squawk given by the controller he looked up and saw a helicopter banking away, by which stage no further avoiding action was necessary.

He assessed the risk of collision as 'None'.

THE SHAWBURY APPROACH CONTROLLER reports giving a Traffic Service and vectors to operating area 'Box C' to the Squirrel pilot. Due to the Watchman radar being on maintenance, Shawbury was operating SSR only and therefore the controller limited the Traffic Service. He passed traffic information on traffic in the Squirrel's 12 o'clock, 10 miles away "opposite direction" indicating

¹ A manoeuvring area 10-19nm south of RAF Shawbury on the 150° -200° radial from 3000ft to FL70.

the same height and squawking 7000. The traffic information was then updated at 5 miles, and the squirrel pilot said he was not visual. The conflicting traffic's SSR return then faded from the display and, shortly afterwards, the Squirrel pilot reported that the aircraft had passed down his right hand side at no more than 100m lateral separation. When asked, the pilot stated that he would like to file an Airprox.

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

THE SHAWBURY ZONE CONTROLLER reports operating SSR-only and controlling a large number of aircraft in the Shawbury area with a number of those under a Traffic Service, he assessed his traffic load as medium-to-high. He was asked by the APP controller whether he had any traffic SW of the Wrekin: no squawks were showing but he advised the APP controller that one of his Basic Service aircraft could be operating there. Although it later transpired that the aircraft was on frequency, the aircraft disappeared from his display after he issued it a squawk, and did not become visible again until after the confliction had occurred.

He perceived the severity of the incident as "High".

THE SHAWBURY SUPERVISOR reports that he did not witness the incident as he was dealing with a landline request from Tern Hill. His attention was drawn to the incident by the APP controller and he made arrangements to have the controller relieved and fill in a DASOR. The pilot of the Europa aircraft contacted him by telephone later that day and stated that he remembered seeing a rotary aircraft while he was in the process of selecting the squawk allocated by the Shawbury Zone controller.

Factual Background

The weather at Shawbury was reported as

METAR EGOS 031450Z AUTO 19012KT 9999 BKN031 06/02 Q0986

Analysis and Investigation

Military ATM

RAF Shawbury were controlling without Primary Radar, which was on maintenance. The APP controller had three aircraft on frequency and described the task difficulty and workload as 'low'. The Zone controller had a busier period with 16 aircraft on frequency, including several under a Traffic Service and the rest under a Basic Service. The Zone controller put the workload as 'medium to high' but the task difficulty as 'low'. The Zone controller had heard APP give Traffic Information to the Squirrel and was keen to get the conflicting Europa on frequency. Zone had spotted an aircraft on an intermittent 7000 squawk and when the Europa free-called, the Zone controller used the position report and DF trace to tie the freecall with the squawk. However, the Europa squawk dropped off and Zone could not confirm visual compliance of the squawk setting or maintain track ident. With other aircraft on frequency under a Traffic Service, the Zone controller put the onus on the Europa to report at the MATZ boundary to maintain awareness of its track.

The APP controller provided the Squirrel with a Traffic Service at 1522:27 and limited the service for 'controlling with Secondary radar only' at 1525:52. At 1526:39 the Europa free-called Zone and at 1527:08 the Zone controller confirmed a Basic Service and provided a squawk of 7427. As per Figure 1 at 1527:28 the APP controller called Traffic Information as, "[Squirrel callsign] *traffic 12 o'clock, one zero miles, opposite direction indicating one hundred feet above.*"

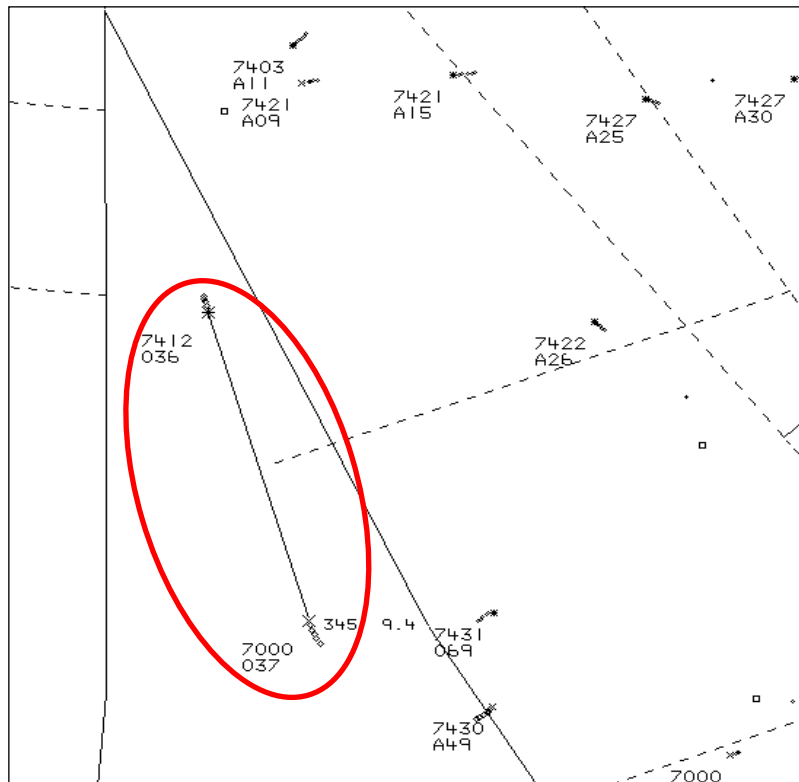


Figure 1: Aircraft geometry at Traffic Information at 1527:28.
(Squirrel on 7412; Europa still on 7000 squawk).

As per Figure 2, the information was updated at 1529:01 with, “[Squirrel callsign] *previously called traffic 12 o’clock four miles, opposite direction, indicating one hundred feet below.*”

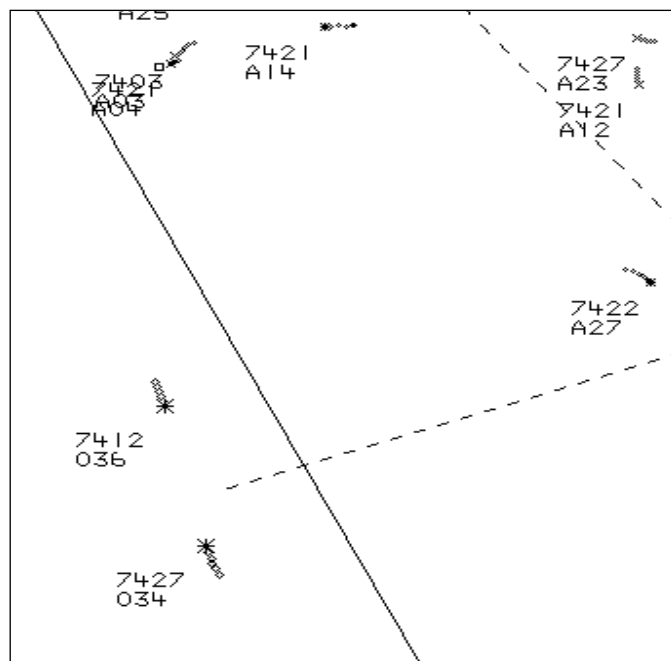


Figure 2: Traffic update at 1529:01.
(Squirrel on 7412; Europa now squawking 7427).

The Squirrel reported that it was not visual and at 1529:18, APP confirmed that the conflictor had faded from radar.

As per Figure 3, at 1529:36, the Europa reports approaching the southern tip of the MATZ and at 1529:50 the Zone controller approves MATZ penetration at 2000ft QFE 994 hPa. (The Europa had originally reported at 3200ft QFE 994 hPa in the descent for 2000ft and was showing 3600ft on QNH 1007 hPa at the CPA).

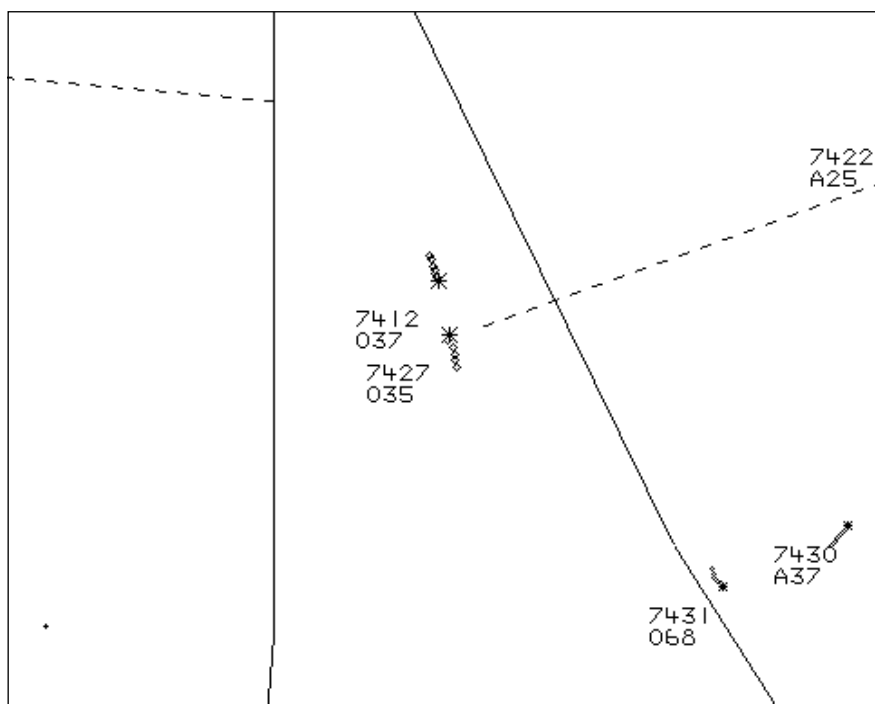


Figure 3: Aircraft geometry as Europa approaching the MATZ boundary at 1529:36

The APP controller described the Europa's squawk as disappearing between sweeps and appearing as garbled, displayed by question marks on the screen. The APP controller became uncomfortable with the display and called across the Approach Room at 1529:35 to ask the Zone controller if there were any aircraft in the Wrekin area. The Zone controller was receiving a transmission from the Europa at the time.

At 1529:50 the Squirrel reported visual with the Europa as it passed down the right-hand side about 100m away. As the APP controller was transmitting, the Europa re-appeared on radar, "[Squirrel callsign] *nothing seen on radar, however, have now got it turned again er in your 6 o'clock.*" The Zone controller identified the Europa at the same time when it was half a mile in the 6 o'clock of the Squirrel.

The late contact with the traffic by the Squirrel pilot can be viewed in the context of potentially spurious TAS readouts and intermittent Traffic Information due to radar coverage and the Primary Radar being on scheduled maintenance. The TAS may have struggled to pick up the intermittent squawk on the Europa, but this was compounded because known inaccurate TAS bearings may have led the pilot to increase the lookout from a focussed area, to a much wider area. The IF training sortie and use of the IF screen also reduced lookout options, especially considering that the onus for lookout was on the pilot in the left hand seat.

The Europa pilot reports momentarily looking inwards to enter the squawk. The squawk was on prior to the CPA; however, as the aircraft were closing the Europa pilot was reporting at the MATZ boundary and would have required a check of the aircraft position, height and pressure setting to conform with the crossing instruction.

The APP controller provided accurate and timely Traffic Information and updated the Squirrel pilot, especially when information was provided on the loss of radar contact, 32 seconds prior to the CPA. A primary return may well have provided the controller with one further update prior to CPA. The

Primary Radar outage was well publicised and all Shawbury parties were aware. The APP controller was uncomfortable with the situation and should be commended for efforts to pass Traffic Information. The Zone controller, despite being busy, demonstrated good situational awareness by understanding the potential for the Europa to conflict with the Squirrel, even prior to it calling for a service.

The barriers that should have prevented the aircraft from such a late sighting were not as reliable as they could have been. The radar-based Traffic Information provided invaluable information at range but could not refine the position due to poor coverage, lack of Primary Radar and possibly a question over the Europa's transponder. The pilot in the left-hand seat had lookout impeded by the screen and the aircraft structure. The Europa may well have been on a constant bearing; the pilot's workload and other responsibilities would also have competed for his attention. Finally, the TAS was not reliable because of the intermittent transponder but also because it has known limitations. In this incident, the TAS did not act as an effective barrier but may have confused the situational awareness and contributed to the late sighting.

As a result of the incident, Shawbury have restricted IF-training sorties when Primary Radar is not available. In addition, guidance has been re-issued to crews to emphasise the aircraft captain's responsibilities for: collision avoidance under a Traffic Service; early action to separate aircraft when conflict is identified; and, enhanced lookout to take into account the aircraft structure. RAF Shawbury ATM recommends that a feed from the Clee Hill Radar would assist controllers in identifying aircraft not seen by the Shawbury Primary or Secondary Radars.

UKAB Secretariat

Both pilots were equally responsible for collision avoidance and for not flying into such proximity as to create a danger of collision². The geometry was 'head-on' and, if the pilots were aware of the other aircraft, they were both required to alter their courses to the right³

Comments

HQ Air Command

Sufficient information was available to prevent the initial situation deteriorating – ATC had called the traffic to the Squirrel at a range of 10nm and the Squirrel also had an intermittent indication on the TAS. However, because the 2 sources of information did not correlate in range, the Squirrel pilot continued on course whilst trying to visually acquire the Europa. ATC gave further TI at a range of 4nm which appears not to have triggered action by the Squirrel pilot. Although the Squirrel had IF screens fitted, thus limiting the lookout of the crew, the TI alone should have alerted the Captain of the Squirrel to manoeuvre the ac away from the previously called traffic. It should also be noted that the TAS fitted to the Squirrel is prone to erroneous azimuth indications and therefore the more reliable azimuth data in this case was the TI from the ATC SSR.

Summary

An Airprox was reported between a Squirrel and a Europa on 14th January 2013, approximately 10nm south of RAF Shawbury. Both aircraft were VMC in class G airspace, the Squirrel was receiving a limited Traffic Service from Shawbury Approach and the Europa was under the process of agreeing a Basic Service with Shawbury Zone. The aircraft passed within 100ft and 0.2nm of each other and neither pilot saw the other in time to take any avoiding action.

² Rules of the Air 2007 (as amended), Rule 8 (Avoiding aerial collisions).

³ *ibid.*, Rule 10 (Approaching head-on).

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, transcripts of the relevant RT frequencies, radar photographs/video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

The Board first considered the actions of the Squirrel pilot and noted that despite having TAS and TI warnings of the Europa he had not taken action to deviate from his track. Some members opined that it was possible that the pilot was either task-focused and had not fully assimilated the gravity of the situation, had been influenced by the uncertainty of his TAS display into discounting the fact that the Europa was still in conflict, or, being on an IF training sortie, had not wanted to deviate from his course for training reasons. However, ultimately, the Board agreed that he had had all the information that he required to avoid this situation from happening; although the TAS was known to be unreliable in azimuth, the information was also given by ATC who had called the conflicting traffic to him at 10nm and at 4nm. The Board also wondered whether the IF screens had reduced his look-out and made a difference in the latter stages of this incident. With this in mind, the Board noted that the CAA has recognised the efficacy of other methods of restricting the view of handling pilots without impacting the view of the safety pilot (such as 'foggles') and no longer mandates the use of such screens for civilian IF training.

The Board noted that the Europa pilot had reported looking into the cockpit to change squawk and did not see the helicopter until he looked up again when it was too late to take avoiding action. Although there will always be actions which require the pilot to focus inside the cockpit, this was a salutary reminder that the maintenance of good look-out by time-sharing in-cockpit tasks with outside scanning is essential.

Turning to ATC, the Board commended the controllers for their pro-active actions and felt that ATC had provided a good level of service despite the circumstances of being SSR-only. Although they noted that RAF Shawbury had now restricted IF-training sorties when Primary Radar is not available, they were not convinced that any better Traffic Information would have been possible over-and-above that which the controllers had already given to the Squirrel pilot.

In discussing the cause, the Board concluded that the Squirrel pilot had had all the information necessary to alter his course; a heading change of just a few degrees would have prevented this from being such a serious incident. Therefore, they determined that the cause of this Airprox was that the Squirrel pilot flew into conflict with the Europa, despite multiple Traffic Information and TAS alerts. This was assessed as a situation that had stopped just short of an actual collision, where separation was reduced to the minimum, and where chance had played a major part in events: Risk Category A.

PART C: ASSESSMENT OF CAUSE AND RISK

<u>Cause:</u>	The Squirrel pilot flew into conflict with the Europa despite multiple Traffic Information and TAS alerts.
<u>Degree of Risk:</u>	A
<u>ERC Score⁴:</u>	100

⁴ 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.