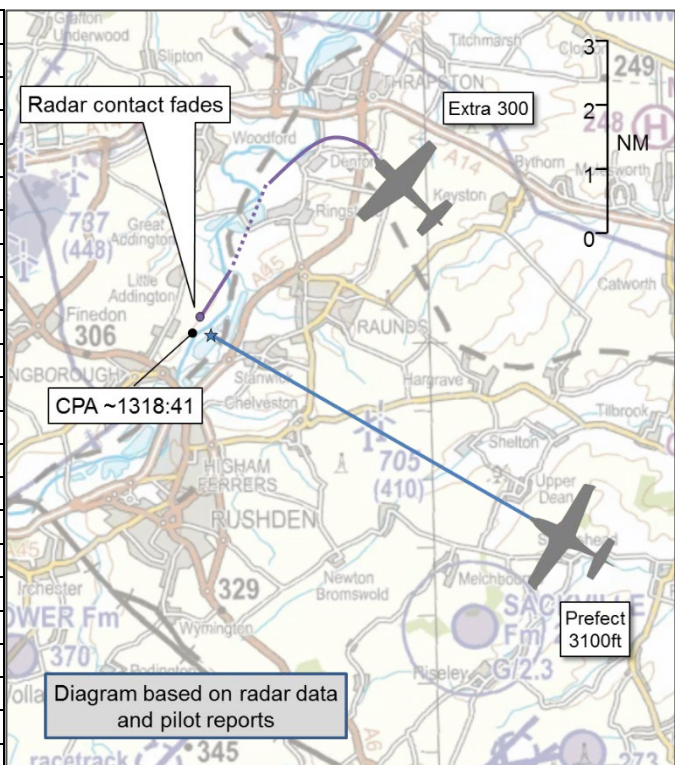


**AIRPROX REPORT No 2019193**

Date: 10 Jul 2019 Time: 1318Z Position: 5220N 00034W Location: East Sywell

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

| Recorded          | Aircraft 1      | Aircraft 2     |
|-------------------|-----------------|----------------|
| Aircraft          | Prefect         | Extra 300      |
| Operator          | HQ Air (Trg)    | Civ FW         |
| Airspace          | London FIR      | London FIR     |
| Class             | G               | G              |
| Rules             | VFR             | VFR            |
| Service           | Traffic         | None           |
| Provider          | Cranwell        |                |
| Altitude/FL       | 3100ft          | NK             |
| Transponder       | A, C, S         | Standby        |
| <b>Reported</b>   |                 |                |
| Colours           | White, Blue     | Dark Blue, Red |
| Lighting          | Anti-Cols, HISL |                |
| Conditions        | VMC             | VMC            |
| Visibility        | 40km            |                |
| Altitude/FL       | 3000ft          | NK             |
| Altimeter         | NK              | NK             |
| Heading           | 302°            | NK             |
| Speed             | 170kt           | NK             |
| ACAS/TAS          | TAS             | Not fitted     |
| Alert             | None            | N/A            |
| <b>Separation</b> |                 |                |
| Reported          | 0ft V/0.25nm H  | Not Seen       |
| Recorded          | NK <sup>1</sup> |                |



**THE PREFECT PILOT** reports flying 3nm south of Kettering, heading north-west, when a black, single-engine prop-aircraft with red stripes, performed a wing-over or looping manoeuvre directly in front of their aircraft. They presumed the other pilot did not know they were in the vicinity because it came from below and appeared directly in front of their aircraft, passing vertically up through their level. It was close enough to cause alarm, and avoiding action was taken by breaking right and climbing 500ft. They did not receive any TAS warnings and immediately reported it to Cranwell ATC, who said they couldn't see anything on the radar so they assumed the other aircraft was not transponding.

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

**THE EXTRA 300 PILOT** reports that he was part of a routine 4-ship passenger-flying sortie at the time of the report. The profile had them manoeuvring as a 4-ship in close formation (including aerobatics) for around 8mins before splitting into 2 pairs for around 7min of singleton aerobatics. At 1310, he would have been leading the second pair, their approximate location at that time is likely to have been east of Rushden, operating between 1500ft and 4000ft agl. He did not see the other aircraft. In hindsight, the transponder was set to standby for the duration of the sortie because he was part of the formation. The procedures have since been amended to ensure that all 4 aircraft squawk Mode S throughout.

**THE CRANWELL DEPARTURES CONTROLLER** reports she was working at medium intensity with 3 aircraft on frequency. The Prefect was on a nav-ex to the south at 3000ft, in receipt of a Traffic Service which had been reduced due to the limits of surveillance cover in his location, although the aircraft was showing in both primary and secondary on the radar. The Prefect pilot asked for a traffic update because a formation had just flown close by, but the only traffic visible on the radar screen was a contact about 5nm away. The controller called that, but the pilot said it wasn't that traffic, he described it as a

<sup>1</sup> Although there is a primary radar contact for the Extra, radar track jitter makes accurate assessment impossible.

formation and thought it might have come out of Sywell and described it 'a little too close for his liking'. Other than the previous called traffic, there was nothing showing on the radar within an 8nm radius of the Prefect, and the pilot reported that there was nothing showing on his TAS either. She opined that the Airprox highlighted the negative impact that the lack of LARS provision in the area was having.

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

**THE CRANWELL SUPERVISOR** reports that the unit was operating during a period of sustained medium-intensity, the visual circuit had been full and he had been in the VCR overseeing events there. On his return to the ACR, the Departures controller alerted him to the incident. He subsequently listened to the RT recordings, the Prefect pilot had requested handover to Marham and this had been attempted by the previous controller, but without any success. Recently, Wittering had only been accepting handovers on inbound traffic, or traffic transiting through their MATZ, which is why the controller had not attempted to handover to them. Consequently the Prefect was operating 35nm away from Cranwell, with no-one to handover to, at the base of radar cover under a reduced Traffic Service; the conflicting traffic did not show on the radar. He opined that it highlighted the difficulty in providing the best possible radar service, and wondered whether the pilot may have been better under a Basic Service using his own look-out for better awareness.

## Factual Background

The weather at Cranwell was recorded as follows:

METAR EGYD 101250Z 26013KT 9999 SCT026 SCT100 BKN250 21/14 Q1017 NOSIG RMK BLU BLU=

## Analysis and Investigation

### Military ATM

The Prefect was conducting a navigation exercise at 3000ft and was in receipt of a Traffic Service from Cranwell Departures. The intended route placed the Prefect close to Marham and Wittering but Cranwell were unable to contact Marham, and Wittering does not provide a LARS service. As a result, the Prefect elected to maintain a Traffic Service from Cranwell even though it was at the extremes of Cranwell surveillance cover. The planned route placed the Prefect some 7-10nm ENE of Sywell and, approx 3nm south of Kettering, the student pilot saw the Extra 300 pull up in front of the Prefect in an aerobatic manoeuvre and took immediate avoiding action. The student estimated the lateral separation as  $\frac{1}{4}$  nm but the instructor did not see the Extra 300 as he was checking the route-map for airspace avoids. The conflicting aircraft did not show on TAS.

Analysis of the radar replay proved to be inconclusive because the Radar Analysis Cell was unable to positively identify the Extra 300. The R/T transcript shows that Cranwell made two attempts to contact Marham approximately 25mins prior to the Airprox occurring but were unable to get through. Discussions with Marham ATC indicate that they were open and available that day but were unaware that Cranwell was attempting to contact them.

Once the Prefect turned west and approached the limits of Cranwell surveillance cover, the Traffic Service was appropriately reduced by the Cranwell Departures Controller. During the next 15 mins, Traffic Information was passed three times to the Prefect on other conflicting traffic but the controller was not aware of the incident until it was reported by the Prefect pilot. When asked if they could see anything on radar, the Cranwell Departures Controller reported one aircraft 5nm away, 2800ft above and a further contact 5nm away 800ft below. Neither of these were the Extra 300 and it is therefore likely that the Extra 300, at the extremes of radar coverage and not transponding, was not showing on Cranwell's radar.

The Cranwell Departures Controller provided the best ATS they could, given the range and altitude of the Prefect. The Traffic Service had been appropriately reduced and Traffic Information had been passed on detected conflictors. It is unfortunate that the Extra 300 had left their transponder in

standby thus decreasing the opportunity of detection by Cranwell surveillance systems resulting in the ATS barrier being ineffective in this incident.

## **UKAB Secretariat**

The Prefect and Extra pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard<sup>2</sup>. When an aircraft carries a serviceable SSR transponder the pilot shall operate the transponder at all times during flight and pilots engaged in formation join-ups are expected to continue to operate the transponder until established in the formation<sup>3</sup>.

## **Comments**

### **HQ Air Command**

As Prefects do not routinely publish flights on CADS and the Extra 300 operating organisation does not have access, the ability to plan to avoid was not available. Due to the Prefect operating at the limit of surveillance cover, their Traffic Service had been downgraded by Cranwell, although it is worth noting that the pilot has commented that a very robust and effective traffic service had been provided during the sortie. The Prefect pilot opted not to contact Wittering during the sortie as 'from past experience, receiving a traffic service from RAF Wittering was highly unlikely'.

Despite the Prefect being under a Traffic Service, albeit reduced, and equipped with a TAS, because the Extra 300 was not squawking nor communicating with an ANSP, lookout remained the only barrier available to the avoidance of a MAC. As the Extra 300 approached the Prefect from below, it is likely that the student pilot did not have much time to react - so the swift actions of the student pilot are to be commended for ensuring that the loss of safe separation did not progress to a MAC. It is noted that the Extra 300 operating authority procedures with regard to squawking have been amended since this Airprox occurred.

This Airprox was subject to a Local Investigation carried out by the Prefect's parent unit. A recommendation was made to investigate the feasibility of Wittering ATC to provide a LARS service to Cranwell- and Barkston Heath-based aircraft operating south of Wittering. If this facility is only available within set times, it has been proposed that a method of promulgating its availability be instigated such as to inform the decision making of crews and supervisors when undertaking this type of sortie. Crews operating in the vicinity of Sywell have been reminded for the potential of this type of encounter to develop.

## **Summary**

An Airprox was reported when a Prefect and an Extra flew into proximity near Sywell at 1318hrs on Wednesday 10<sup>th</sup> July 2019. Both pilots were operating under VFR in VMC, the Prefect pilot in receipt of a Traffic Service from Cranwell. The Extra pilot was not in receipt of an ATS.

## **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 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 looked at the actions of the Prefect pilot. He was receiving a reduced Traffic Service from Cranwell that had been reduced because he was operating at the limits of the Cranwell radar coverage. He was not given Traffic Information on the Extra because the controller could not see it on

<sup>2</sup> SERA.3205 Proximity. MAA RA 2307 paragraphs 1 and 2.

<sup>3</sup> SEAR. 13001 Operation of a transponder and GM1 SERA 13001

the radar (**CF5**). The Board heard that originally the Prefect had planned to fly the sortie at 5000ft, which would have put it out of the range of most GA traffic, but that weather conditions forced it down. Although fitted with a TAS, it did not alert because the Extra was not squawking (**CF6**). Without any information from either ATC or the CWS, the pilot had no situational awareness that the Extra was operating there. However, even though he had seen the other aircraft at a late stage, he managed to take avoiding action (**CF8**) which the Board thought had probably increased the separation.

The Extra pilot reported that he had earlier been part of a formation and so had switched off his transponder, as allowed under SERA regulation. However, when the formation had split and he was undertaking aerobatics, he had not switched it back on again. Whilst noting that this was done in error, the Board wished to remind pilots that SERA.13001 mandated the use of the transponder at all times for powered aircraft (**CF2, CF3, CF4**), but were heartened to hear that the Extra's operating company were going to update their procedures. That being said, the operating company may wish to review the statement that 'all aircraft will squawk Mode S throughout' because SERA does allow for formation aircraft not to squawk when in close formation so that garbling does not occur on radar screens. Members noted that the Extra was not equipped with a CWS, nor was the pilot receiving an ATS, so he had no situational awareness about the Prefect (**CF5**) and did not see it (**CF7**). The Board briefly discussed whether the Extra operating company should be allowed access to CADS, but were told that for security reasons it was not feasible to allow everyone access, and anyway the Prefects did not routinely input their sorties into CADS unless they were flying low-level and so it would likely not have affected the outcome in this case.

The Board then turned to the role that ATC had to play. The Cranwell controller had tried to hand the Prefect over to Marham, but RAF representatives told the Board that they believed that there was some sort of equipment malfunction because Marham did not receive the call. The Cranwell controller was working at the limits of radar coverage and could not see the Extra on the radar (**CF1**) and therefore could not give Traffic Information. Members noted that most units will only provide a radar service out to 40nm and so the Prefect was also at the limits of Marham's radar coverage as well (although it would have been in coverage for other parts of the sortie). There then followed a discussion about who could provide a LARS service in that area. Noting that there was a gap in the area, RAF personnel said that RAF Wittering had in the past provided a service to the Prefects, but since the Tutor flying at Wittering had increased they did not have the staff or the radar consoles to be able to do so when busy with their own traffic (there were only 2 radar consoles). At the time of this Airprox, Wittering were working to capacity and could not take the Prefect. However, the Board were heartened to hear that, in future, the RAF was intending to try to co-ordinate the needs of its training aircraft to make best use of its RAF controllers. However, for GA requiring a LARS service, Wittering were unlikely to be able to help, other than for a MATZ-crossing service. Some members with experience of flying in the area said that Lakenheath would often try to help out, but the USAFE advisor made clear that this was also subject to any traffic they had at the time and noted that Lakenheath would not routinely provide a LARS service. CAA advisers told the Board that they were aware of the gaps in the LARS provision and that it was hoped that this could be addressed in the future airspace modernisation programme. As an aside from this Airprox, members noted that the gap in the LARS service was not adequately portrayed in the LARS frequency cards given to GA pilots. The NATS representative agreed to investigate this further.

Finally, whilst discussing the controllers' reports members wished to disagree with the Supervisor's comment that the Prefect pilot may have been better off with a Basic Service, commenting that pilots would not look-out any less because they were receiving a Traffic Service, and that pilots should be encouraged to ask for the best service available.

When assessing the risk, members briefly discussed whether the Prefect pilot's avoiding action had been completed in time to remove the risk of collision (Category C) but quickly dismissed that notion as they agreed that, with <0.1nm separation recorded on radar, safety had been reduced much below the norm due to the late sighting by the Prefect pilot and non-sighting by the Extra pilot; risk Category B.

**PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK****Contributory Factors:**

|    | 2019193   |  |  |
|----|---|--|--|
| CF | Factor  | Description                                | Amplification  |
|    | <b>Ground Elements</b>  |  |  |
|    | <b>• Situational Awareness and Action</b>                             |  |  |
| 1  | Contextual  | • Situational Awareness and Sensory Events | Generic, late, no or incorrect Situational Awareness             |
|    | <b>Flight Elements</b>  |  |  |
|    | <b>• Regulations, Processes, Procedures and Compliance</b>            |  |  |
| 2  | Human Factors   | • Flight Crew ATM Procedure Deviation      | Regulations/procedures not complied with                         |
|    | <b>• Tactical Planning and Execution</b>                              |  |  |
| 3  | Human Factors   | • Action Performed Incorrectly             | Incorrect or ineffective execution                               |
| 4  | Human Factors   | • Transponder Selection and Usage          |  |
|    | <b>• Situational Awareness of the Conflicting Aircraft and Action</b> |  |  |
| 5  | Contextual  | • Situational Awareness and Sensory Events | Generic, late, no or incorrect Situational Awareness             |
|    | <b>• Electronic Warning System Operation and Compliance</b>           |  |  |
| 6  | Technical   | • ACAS/TCAS System Failure                 | Incompatible CWS equipment                                       |
|    | <b>• See and Avoid</b>  |  |  |
| 7  | Human Factors   | • Monitoring of Other Aircraft             | Non-sighting or effectively a non-sighting by one or both pilots |
| 8  | Human Factors   | • Monitoring of Other Aircraft             | Late-sighting by one or both pilots                              |

**Degree of Risk:** B.

**Safety Barrier Assessment<sup>4</sup>**

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

**Ground Elements:**

**Situational Awareness of the Confliction and Action** were assessed as **ineffective** because the Cranwell controller could not see the Extra on their radar and so could not give Traffic Information to the Prefect.

**Flight Elements:**

**Regulations, Processes, Procedures and Compliance** were assessed as **ineffective** because the Extra pilot had not selected his transponder on.

**Tactical Planning and Execution** was assessed as **ineffective** because the Extra formation did not switch on their transponders once the formation split.

**Situational Awareness of the Conflicting Aircraft and Action** were assessed as **ineffective** because neither pilot knew about the other aircraft.

<sup>4</sup> 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 the TAS in the Prefect could not detect the non-transponding Extra.

**See and Avoid** were assessed as **ineffective** because neither pilot saw the other in time to take timely and effective avoiding action.

| <b>Airprox Barrier Assessment: 2019193</b> |  | Outside Controlled Airspace |                   |                         |          |     |     |
|--|--|-----------------------------|-------------------|-------------------------|----------|-----|-----|
| Barrier                                    | Provision  | Application                 | Effectiveness     |                         |          |     |     |
|  |  |                             | Barrier Weighting |                         |          |     |     |
|  |  |                             | 0%                | 5%                      | 10%      | 15% | 20% |
| Ground Element                             | Regulations, Processes, Procedures and Compliance          | ✓                           | ✓                 | [Green bar: 0% to 5%]   |          |     |     |
|  | Manning & Equipment  | ✓                           | ✓                 | [Green bar: 0% to 2.5%] |          |     |     |
|  | Situational Awareness of the Confliction & Action          | ✗                           | ✗                 | [Red bar: 0% to 15%]    |          |     |     |
|  | Electronic Warning System Operation and Compliance         | ○                           | ○                 | [Grey bar: 0% to 2.5%]  |          |     |     |
| Flight Element                             | Regulations, Processes, Procedures and Compliance          | ✓                           | ✗                 | [Red bar: 0% to 10%]    |          |     |     |
|  | Tactical Planning and Execution                            | ✓                           | ✗                 | [Red bar: 0% to 10%]    |          |     |     |
|  | Situational Awareness of the Conflicting Aircraft & Action | ✗                           | ✓                 | [Red bar: 0% to 20%]    |          |     |     |
|  | Electronic Warning System Operation and Compliance         | ✗                           | ✗                 | [Red bar: 0% to 15%]    |          |     |     |
|  | See & Avoid  | ✗                           | ✗                 | [Red bar: 0% to 20%]    |          |     |     |
| <b>Key:</b>                                |  |                             |                   |                         |          |     |     |
|  | Full   | Partial                     | None              | Not Present             | Not Used |     |     |
| Provision                                  | ✓  | ⚠                           | ✗                 | ○                       | ○        |     |     |
| Application                                | ✓  | ⚠                           | ✗                 | ○                       | ○        |     |     |
| Effectiveness                              | ■  | ■                           | ■                 | ■                       | □        |     |     |