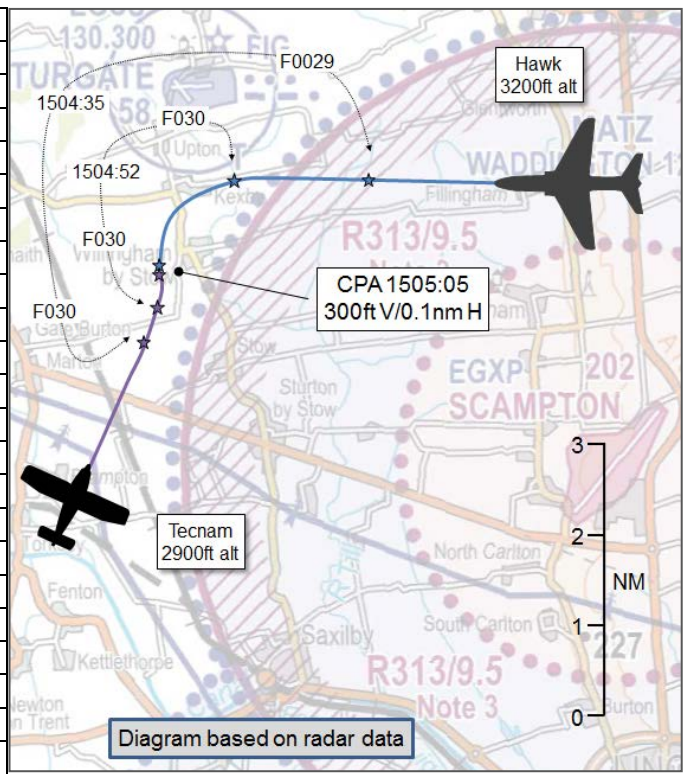


**AIRPROX REPORT No 2017030**

Date: 01 Mar 2017 Time: 1505Z Position: 5319N 00042W Location: 5 nm W Scampton

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

Recorded	Aircraft 1	Aircraft 2
Aircraft	Hawk	Tecnam P2008
Operator	HQ Air (Trg)	Civ Trg
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	Traffic	Basic
Provider	Waddington	Waddington
Altitude/FL	3200ft	2900ft
Transponder	A, C, S	A, C
<b>Reported</b>		
Colours	Red	White, Blue
Lighting		Nav, Strobes
Conditions	VMC	VMC
Visibility	30km	>15km
Altitude/FL	NR	2000ft
Altimeter	QNH (997hPa)	NK
Heading	270°	360°
Speed		100kt
ACAS/TAS	Not fitted	Not fitted
<b>Separation</b>		
Reported	300-500ft V	300ft V/0m H
Recorded	300ft V/<0.1nm H	



**THE HAWK PILOT** reports that during a training sortie at RAF Scampton, a light aircraft was seen directly beneath the formation with an estimated range of 300-500ft vertically. At the time, the formation were receiving a Traffic Service from Waddington LARS. They were in a positioning turn prior to the next training serial. The controller first called traffic on a contact on the 160° radial 6-8nm from Scampton. The next call was concurrent with becoming visual with the Airprox traffic passing beneath the formation. The controller confirmed it was GA traffic that was outside R313 and visual with the formation. Usually, the traffic picture given to RAFAT training aircraft by Waddington is excellent but, in this case, if an earlier indication on the westerly traffic had been made, the formation may have been able to make an earlier turn, or changed direction.

He assessed the risk of collision as 'Medium'.

**THE TECNAM PILOT** reports that he was receiving a Basic Service from Waddington on a solo student navigation exercise. At about 1450 he enquired on the status of R313 and was informed it would be going cold shortly. He looked out to his right and saw the formation overhead Scampton so continued to orbit west of Scampton to remain clear. Whilst checking the GPS to ensure he was clear of R313 he received a traffic call from Waddington stating the position of the Red Arrows formation. He reported visual and, because the formation had started a left turn onto south, he judged that they would be leaving R313 and pass overhead. Knowing they would not be able to manoeuvre the formation easily, he descended to ensure separation.

He assessed the risk of collision as 'Low'.

**THE WADDINGTON APP/DIR CONTROLLER** reports that he came on shift at 1500 and was immediately very busy. He was controlling 4 speaking units over 3 frequencies in busy Lincolnshire airspace. He had multiple aircraft, and multiple contacts in conflict with the aircraft on his frequencies. R313 was hot due to the Red Arrows, who were on one of his frequencies. They were

due to land at 1500, but the sortie was extended to 1520, this resulted in holding off aircraft wanting to recover to Waddington in high traffic density Class G airspace. While the Hawk formation was inside R313, Traffic Information was passed on multiple tracks routing on the fringe of R313. LARS had an aircraft wanting a Waddington MATZ crossing who was told to remain outside R313, the pilot seemed unsure of his heading and his heading selection seemed erratic; he very briefly infringed R313. He was instructing aircraft on other frequencies when he saw the formation outside R313 close to a Scampton flying club aircraft that was operating 2-3nm outside R313. The formation turned directly towards the other aircraft, so he jumped straight onto the frequency with Traffic Information. The formation leader called visual with the traffic and he informed them that the traffic had been visual with them at all times. He noted that he was working to capacity and the Supervisor was up in the VCR because the visual circuit was also busy and there was a traffic light failure. Fortunately, the previous APP/DIR controller stayed to act in a supervisor role to help with liaison calls. He commented that he should have asked for a DIR, although he was subsequently told there wasn't one available anyway.

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

**THE WADDINGTON SUPERVISOR** reports that he had left the ACR shortly before the incident because he was aware that the ADC was very busy and had an Apache joining, which was unusual for Waddington. When he left the room, the Approach controller was working the Reds in R313 and two other tracks, one of which was returning to the visual circuit; LARS was also manned and fairly busy. He judged the situation to be under control, and so made the decision to go to the VCR to monitor the ADC during what was the busiest period he had seen at Waddington for a long time. Whilst there, the lighting panel gave a warning that indicated that the traffic lights on the RW02 threshold had failed and so he remained there, investigating the failure, calling the airfield electrician and sending a vehicle to implement a road-block to allow aircraft to land. All of which meant that he remained in the VCR for longer than he anticipated. On returning to the ACR, the Airprox had not yet occurred, but it was immediately apparent that the controller was busy. He saw the formation manoeuvring 2-3 nm outside R313 and commented that, in his opinion, the pilot of the aircraft hanging on the edge of R313 whilst it was hot was not displaying particularly good airmanship. He felt that the following factors all contributed to the Airprox: limited manpower at Waddington (there was no qualified controller to allow the App/Dir task to be spilt); the late arrival of visiting aircraft causing the visual circuit to be busier than expected; the traffic light failure leading to unexpected workload and the Supervisor remaining in the VCR; the Red Arrows sortie extending past the planned R313 cold time when Scampton flying club aircraft were airborne; the Red Arrows operating outside R313; and Waddington squadrons failing to notify sortie details to allow for ATC planning of manpower or practice diversions.

## Factual Background

The weather at Waddington was recorded as follows:

METAR EGXW 011450Z 23012KT 9999 FEW030 BKN060 09/02 Q0995 BLU NOSIG=

Portions of the tape transcripts between the Waddington Approach Radar controller and the Hawk are below:

From	To	Speech Transcription	Time
Hawk	Approach	Waddington [Hawk c/s] go ahead	1503.08
Approach	Hawk	[Hawk c/s] Waddington there is traffic Scampton one six zero, seven miles manoeuvring ..... two thousand five hundred feet, has been told to remain clear of three one three.	1503.10
Hawk	Approach	??? [Hawk c/s]	1503.24
Approach	Hawk	[Hawk c/s] Waddington	1504.52
Hawk	Approach	Waddington [Hawk c/s] go ahead	1504.55
Approach	Hawk	[Hawk c/s] traffic your position south one mile tracking north similar altitude	1504.57
Hawk	Approach	Err [Hawk c/s] visual	1505.02

From	To	Speech Transcription	Time
Hawk	Approach	Waddington [Hawk c/s] can you confirm that that track was inside or outside of three one three	1505.20
Approach	Hawk	[Hawk c/s] that is outside of Romeo three one three	1505.25
Hawk	Approach	Copied	1505.28
Approach	Hawk	[Hawk c/s] its err waiting to come inbound to Scampton its one of the flying club	1505.30
Hawk	Approach	Apologies say again for [Hawk c/s]	1505.34
Approach	Hawk	[Hawk c/s] err the traffic was visual with you, it's one of the flying club awaiting to come into err Scampton	1505.36
Hawk	Approach	Err Waddington can you confirm he was visual with us throughout	1505.56
Approach	Hawk	[Hawk c/s] Affirm	1506.00

Portions of the tape transcripts between the Waddington LARS controller and the Tecnam are below:

From	To	Speech Transcription	Time
LARS	Tecnam	{Tecnam c/s} traffic twelve o clock two miles, crossing right left ahead, fast moving indicating three hundred feet below, red arrows	1504.41
Tecnam	LARS	{Tecnam c/s} visual	1504.47

## Analysis and Investigation

### Military ATM

Figures 1-3 depict the positions of the Hawk and Tecnam at pertinent times in the lead up to and during the Airprox. The screen shots are taken from a replay of the Claxby radar feed, which is not the feed utilised by Waddington ATC therefore not the picture seen by the controllers involved.

At 15:04:41 (Figure 1), the Waddington LARS controller passed Traffic Information (TI) to the Tecnam on traffic 12 o'clock, 2nm, crossing right to left ahead, fast moving, indicating 300ft below.

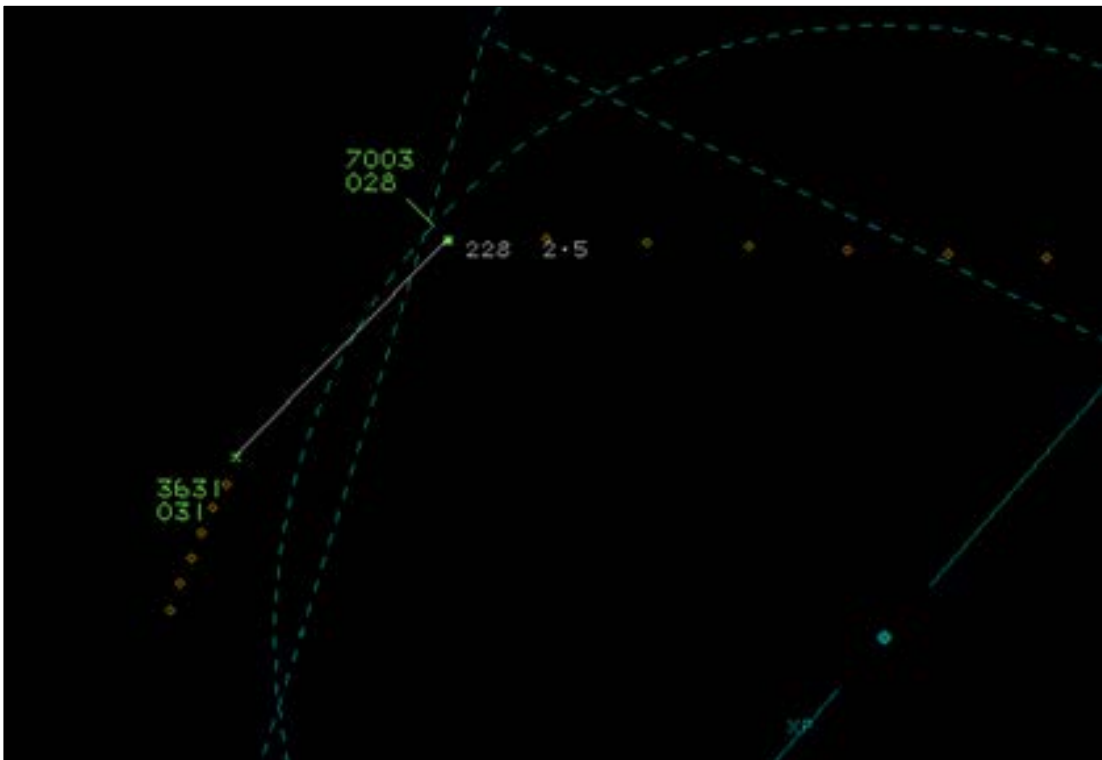


Figure 1: Geometry at 15:04:41 (Hawk 7003; Tecnam 3631)

At 15:04:57 (Figure 2), the Waddington RA controller passed TI to the Hawk on traffic south, 1nm, tracking north, similar altitude.

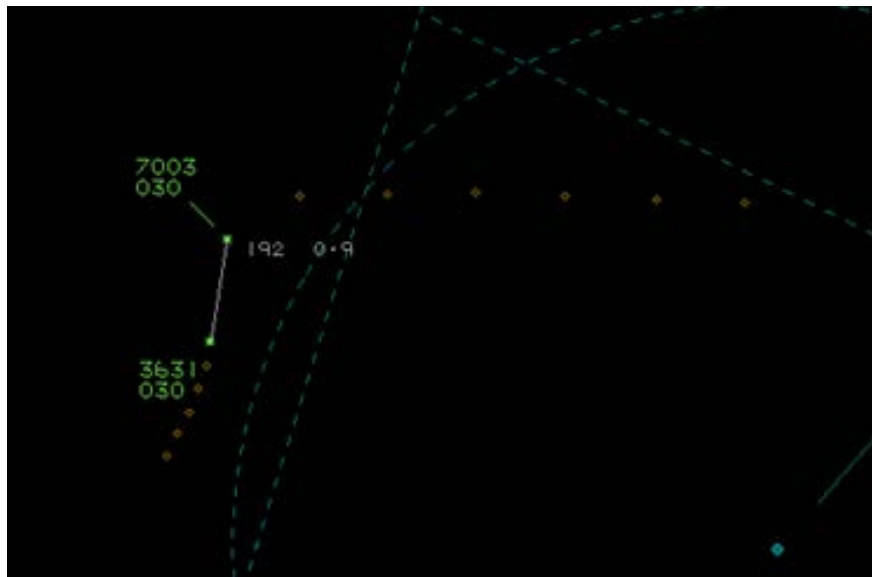


Figure 2: Geometry at 15:04:57 (Hawk 7003; Tecnam 3631)

At 15:05:05 (Figure 3), the two aircraft passed at their CPA.



Figure 3: Geometry at 15:05:57 (Hawk 7003; Tecnam 3631)

The Waddington LARS controller, though dealing with an infringement of R313 to the south east and multiple other GA aircraft, noticed that the Hawk was tracking west at high speed and believed there to be risk of collision with the Tecnam, therefore passed TI to the aircraft, who was in fact visual with the Hawk.

The Waddington RA controller, operating band boxed as Director, had high workload, with 3 aircraft, 2 of which were holding for radar approaches at Waddington, on 3 frequencies in high

traffic density airspace. He had passed TI to the Hawk on traffic to the south east of the operating area and, although aware of the Tecnam holding to the west, had been focussed on an infringement to the south east. By the time the controller noticed the Hawk's track westbound and the proximity of the Tecnam, there was little time to pass TI, therefore the TI coincided with the Hawk visually acquiring the traffic.

The visual circuit at Waddington was reportedly full for the first time in over 2 years, in combination with an airfield lighting failure, hence the Supervisor had appropriately positioned in the VCR to provide assistance there. An off-going controller had remained in the ACR to assist the RA and LARS controllers with admin tasks; however, there was insufficient manpower to split out the RA and Director positions. This inability for the RA to offload the Dir task contributed to their poor division of attention, and the lack of timely TI that would have given the Hawk the Situational Awareness to choose to operate away from the holding Tecnam.

### **UKAB Secretariat**

The Hawk and Tecnam 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>1</sup>. If the incident geometry is considered as converging then the Tecnam pilot was required to give way to the Hawk<sup>2</sup>. If the incident geometry is considered as head-on or nearly so then both pilots were required to turn to the right<sup>3</sup>.

## **Comments**

### **The Tecnam Operating Authority**

The pilot was outside the confines of R313 and receiving a Basic Service from Waddington. He was also visual with the display. However, in a slow training aircraft his manoeuvrability was much less than that of a Hawk.

### **HQ Air Command**

This Airprox took place in class G airspace during what was clearly a busy time for Waddington ATC. Whilst manoeuvring the Hawk formation within R313, the formation leader had developed a mental air picture of traffic outside R313 to the S and SE by 2-3 nm based on the Traffic Service provided by Waddington ATC. As the formation were in the NW corner of R313 and therefore, as he believed, well away from the traffic, the formation leader elected to carry out a positioning turn which took the formation outside of R313 to the west. As the formation made this turn they visually acquired the light aircraft at the same time as it was reported by Waddington ATC. Until then, the formation leader was unaware of the aircraft's close proximity based on previous traffic calls and his mental model of the air picture. He was also not aware of the workload on Waddington ATC before the Airprox happened. Fortunately in this case the barrier of see and avoid was adequate as the Tecnam had visually acquired the formation and had descended to ensure separation.

## **Summary**

An Airprox was reported when a Hawk and a Tecnam flew into proximity at 1505 on 1<sup>st</sup> March 2017. Both pilots were operating under VFR in VMC, the Hawk pilot in receipt of a Traffic Service from Waddington and the Tecnam pilot in receipt of a Basic Service also from Waddington.

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<sup>1</sup> SERA.3205 Proximity.

<sup>2</sup> SERA.3210 Right-of-way (c)(2) Converging.

<sup>3</sup> SERA.3210 Right-of-way (c)(1) Approaching head-on.

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

Information available consisted of reports from the pilots of both aircraft, 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 looked at the actions of the Hawk pilot. They were told that he was leading five Hawks who were practising their display in their constituent elements. Some members wondered whether it was usual and prudent for them to fly outside the protected confines of R313 in what was a relatively non-maneuvrable formation. The military members commented that although later in the season when the display was more practised this wouldn't happen, at this stage they were still in the early stages of finalising the display and so positioning turns that took the formation outside R313 were sometimes required. Although they were perfectly entitled to exit R313 for re-positioning, some members wondered whether this had surprised both the Tecnam pilot and the controller, both of whom might have expected the Hawks to remain within. The Board noted that the Hawks were receiving a Traffic Service from Waddington, and that the pilot had described having a mental model of the air picture outside R313 which led him to believe that there was nothing to affect them to the west. The Board thought this was reasonable, and that cockpit workload in formation displaying would have meant that he was highly reliant upon ATC to call traffic to them; that ATC had not mentioned the traffic to the West meant that he had no situational awareness of it as he exited R313. Recognising that he would have had many factors at play in positioning the formation, that said, once steady on a westerly heading outside the protected confines of R313, look-out was once again a priority and some members wondered if he had conducted a robust scan to the south prior to turning; the Tecnam was there to be seen before he turned towards, and ultimately over the top, of it.

Looking next at the actions of the Tecnam pilot, the Board thought that he was placed in a very difficult situation that he had handled well. He was on a solo-student nav-ex and was expecting to be able to return to Scampton at 1500hrs after the Red arrows had landed. On his arrival in the vicinity, he was told that R313 remained hot and that he would need to hold off. The Board disagreed with the ATC Supervisors comment that in his opinion he had demonstrated a lack of airmanship in holding where he did: he was talking to Waddington on the RT, waiting to return to Scampton, and members commented that he was perfectly entitled to hold near to, but still outside R313. Although only on a Basic Service, Waddington LARS did give him Traffic Information, and holding where he was, he could see the Hawks clearly. He was likely surprised to see them exit R313, and even more surprised when they unexpectedly turned towards him but, having seen them turn, he took appropriate action by descending to avoid a fast-moving and unpredictable formation approaching him head-on.

The Board then discussed the part that ATC had played. The LARS controller was providing a Basic Service to the Tecnam and was also dealing with another pilot (who eventually infringed R313) and who was taking time and attention to deal with. Nevertheless, the controller identified that there was a potential conflict between the Tecnam and the Hawks, and gave the Tecnam pilot essential Traffic Information for which he was commended by the Board. For his part, the App/Dir controller was extremely busy. Noting that he was working 3 band-boxed frequencies in busy airspace without the option to split the task, the Board acknowledged that his workload was high. Nevertheless, controller members opined that he had allowed himself to become distracted by the infringement traffic (which was being controlled by another controller), and which, in any event, was to the south of R313, away from the Hawks. The Board heard that he had passed Traffic Information to the Hawks on this traffic, prior to it entering R313 but, ultimately, by not providing Traffic Information on the Tecnam, he had deprived the Hawk pilot of the knowledge that there was also traffic to affect to the west.

The Board noted that the Supervisor had only arrived in the ACR just prior to the incident and some members thought that had he been in the ACR throughout he might have been able to deal with the infringing aircraft to the south thus allowing the App controller to concentrate on the task in hand. That said, it was noted that the off-going App controller did remain in the ACR to try and help the

controllers, and the Board commended him for this. They noted that in previous Airprox<sup>4</sup> they had recommended that the RAF consider whether there was a case for both VCR and ACR supervisors in order to negate the problem of Supervisors needing to be in two places at once. They were informed by RAF military members that SATCOs are empowered to position a suitably qualified controller in the VCR to act as a 'visual supervisor' during busy periods, but that there was no additional manpower available to do this. Given that on this occasion Waddington did not have the resources available even to man the DIR position, the Board felt that the reality was that there was little chance of a simultaneous VCR and ACR supervisory presence.

The Board then debated the cause and risk of the Airprox. Some members thought that because they were in Class G airspace and had turned towards the Tecnam, the Hawks had effectively flown into conflict. Others reasoned that this was unfair given that they didn't know the Tecnam was there until the last moment, and therefore this was best described as simply a conflict in Class G airspace. Eventually, the Chairman put it to a vote and, by a clear majority, the latter view prevailed and so the Board determined that this had been a conflict in Class G airspace resolved by the Tecnam pilot. They quickly agreed that there were two contributory factors in that there had been late Traffic Information to the Hawk pilots and that the controller had been distracted by 3 band-boxed frequencies and other traffic. In assessing the risk, the Board agreed that because the Tecnam pilot was visual with the Hawks throughout, although safety had been degraded, there had been no risk of collision: Risk Category C.

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

Cause: A conflict in Class G resolved by the Tecnam pilot.

Contributory Factors:

1. Late Traffic Information from the Waddington controller to the Hawk pilots.
2. The controller was distracted by 3 band-boxed frequencies and other traffic.

Degree of Risk: C.

#### **Safety Barrier Assessment<sup>5</sup>**

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

**ATC Strategic Management & Planning** was assessed as **partially effective** because the App controller was band-boxed and not able to split the tasking (thereby increasing his workload) and the off-going controller had felt it necessary to remain in the ACR to assist.

**ATC Conflict Detection and Resolution** was assessed as **partially effective** because the App controller did not pass timely TI to the Hawks but the LARS controller was able to pass TI to the Tecnam pilot.

**Flight Crew Situational Awareness** was assessed as **partially effective** because the Hawks were not aware of the Tecnam but the Tecnam pilot was aware of the Hawks.

**Onboard Warning/Collision Avoidance System** was assessed as **inapplicable** because neither aircraft had a CWS.

<sup>4</sup> Airprox 2015093

<sup>5</sup> The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the [UKAB Website](#).

**See and Avoid** was assessed as **partially effective** because although the Tecnam pilot was able to take avoiding action, due the dynamic nature of the Hawks manoeuvring this was only at the last minute.

