AIRPROX REPORT No 2023034

Date: 27 Mar 2023 Time: 1313Z Position: 5247N 00018W Location: 4.5NM W Spalding

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Prefect	Yak 18
Operator	HQ Air (Trg)	Civ FW
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	Traffic	Basic
Provider	Cranwell Departure	Waddington
Altitude/FL	FL042	FL031
Transponder	A, C, S	A, C, S
Reported		
Colours	White, blue	Blue
Lighting	HISL, nav, landing	Beacon
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	4000ft	3300ft
Altimeter	RPS (1021hPa)	QNH (NK hPa)
Heading	180°	130°
Speed	140kt	130kt
ACAS/TAS	TAS	Not fitted
Alert	Information	N/A
Separation at CPA		
Reported	200ft V/0ft H	1000ft V/NR NM H
Recorded	1100ft V/0.1NM H	

THE PREFECT PILOT reports that they were the QFI with an Elementary Flight Training (EFT) trainee conducting a practice diversion to Wittering following general handling as part of an initial Instrument Flying [lesson]. They had been constrained by weather that had included clouds below 0°C, around which the student had manoeuvred at [the Prefect pilot's] direction, to remain VFR during the transit to Wittering. Comms had been busy during the sortie with several traffic calls which had provided some challenges in delivering the lesson.

They were issued a squawk by Cranwell Departures for the handover, and then traffic was called as 'S/SE 6 miles tracking NW, 600ft below, light civilian'. Neither they nor the trainee could see the traffic, and called 'not sighted'. The frequency for Wittering was then passed, which the student misheard, with [the Prefect pilot] having to confirm the frequency and highlight that it was a studded frequency. During this period of 'eyes in', the TAS traffic alert triggered against a contact that was indicating 200ft below them and on their left beam. [The Prefect pilot] took control and climbed, banking the aircraft left to try to acquire the traffic. They saw a black, single-engine civilian aircraft with red wing flashes go underneath them from their 10 o'clock position. It was close enough that they could confidently identify it as a Yak-18T, and estimated it as being 200ft below them. They reported an Airprox once on the Wittering frequency.

[The Prefect pilot] believes it is worth pointing out that although this may seem like another case of 'TAS saves the day', it is noteworthy that the initial traffic call did not focus their attention on the traffic in the same way as the TAS. This could be an indication of the positive effect of the TAS, or possibly an indication that they (and perhaps others) are becoming reliant upon TAS at the expense of heeding ATC traffic calls, particularly during sorties with busy comms and frequent traffic calls.

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

THE YAK 18 PILOT reports that [they were on a] VFR flight heading north-northwest and level at 3300ft. They had a Basic Service from Waddington. Waddington advised them of an aircraft in the 10 o'clock position heading northwest to southeast, indicating 400ft above. They called "Looking!". The [Prefect] was visually identified high above in their 10 o'clock position, some way out (approximately 2NM). [The Yak 18 pilot] rocked their wings to make themselves more visible to the Prefect which continued to climb above. The Prefect was in sight at all times and passed-by to the side with more than 1000ft vertical separation. No report or avoiding action was deemed necessary.

The pilot assessed the risk of collision as 'None'.

THE CRANWELL DEPARTURES CONTROLLER reports that they were the Cranwell (CWL) departures controller, controlling 3-4 Prefects all general handling in Sector 3 and 4 south of CWL and Barkston Heath (BKH). CWL was operating RW26 and BKH RW28, colour code blue and the Barnsley RPS 1021hPa. Their radar sensor selection was WAM, CWL STAR-NG, CON STAR-NG. [There had been a] Topsky [radar software] update that happened over the weekend.

They were working 3 aircraft at the time, one [uninvolved] Prefect west of BKH, [the Prefect of this Airprox] south of BKH and another Prefect NW of Wittering. [The Prefect of this Airprox] was operating in the block 3000-8000ft on the RPS 1021hPa and was booked-in for a practice diversion to Wittering.

[The Cranwell Departures controller] called traffic to them at 1307, 'pop-up traffic with no height indication' and 'Radar Training Circuit (RTC)'. The pilot was not visual with either.

They called further traffic at 1309, SE, 5NM tracking SW, 2000ft below (squawking 7000). [The pilot of the Prefect] asked if that call was for them which they replied 'affirm' and re-called the traffic. [The pilot of the Prefect] replied 'not visual' then asked for a handover to Wittering. [The Cranwell Departures controller] called Wittering and conducted the handover; they pointed out the 7000 squawk to the Wittering controller and told them the pilot wasn't visual. The Wittering controller pointed out further traffic, left 11 o'clock 6 miles opposite direction, 600ft below. [The Cranwell Departures controller] then relayed this to the pilot, 'further traffic SE, 6 miles tracking NW, indicating 600ft below', (it was squawking 3602 – a Waddington LARS squawk), to which the pilot replied 'not visual'. The Wittering controller then gave their frequency, 234.075MHz, and the call ended.

[The Cranwell Departures controller] told [the pilot of the Prefect] to contact Wittering on 234.075MHz. The pilot mis-read the frequency, so they repeated the frequency and the pilot read it back correctly. As the pilot was reading-back the frequency, a Short Term Conflict Alert (STCA) popped up, and with the Topsky update, an additional box popped up on the screen. The box stated 'Impending STCA [Yak 18 callsign] = [Prefect callsign] in 28 Sec'. At this point, the two aircraft were 3.5NM apart with a Mode C readout of 038 and 032, 600ft separation. They did not re-call the traffic as they did not feel it necessary and [the pilot of the Prefect] then left the frequency.

The controller perceived the severity of the incident as 'Low'.

THE WITTERING RADAR APPROACH CONTROLLER reports that they were the RAF Wittering Radar Approach controller for the period leading to, during, and following the Airprox declared by [the pilot of the Prefect] northeast of Bourne, squawking 3743.

[The pilot of the Prefect] was booked into Wittering for an IFR recovery practice diversion with an ETA of 1320. RAF Cranwell called slightly prior to this time to handover [the pilot of the Prefect], general handling in an altitude block (2000-8000ft Barnsley RPS), tracking south, under a Traffic Service, prior to recovery. The handover was standard and completed swiftly, and included Traffic Information passed by the receiving Wittering controller to the Cranwell controller, on conflicting traffic, 6NM southeast of [the Prefect], squawking 3602. This Traffic Information was passed to [the pilot of the Prefect] (it was not known whether [the pilot of the Prefect] reported visual with this traffic). Following this, [the pilot of the Prefect] was instructed to contact Wittering Approach on the published frequency, 234.075MHz.

The initial-contact communication with [the pilot of the Prefect] was a declaration of an Airprox. The initial broadcast stated that they had experienced an Airprox with a black aircraft with red flashes, 100-

200ft below, appearing in their left, 11 o'clock. [The pilot of the Prefect] was identified and provided with Traffic Information on the previous contact identified during the handover, which was now north of [the Prefect], tracking northwards (squawking 3602). [The pilot of the Prefect] confirmed that they were content to continue the sortie, and a normal instrument recovery was completed to Wittering with the oncoming Wittering Approach controller (UT and Screen). An ADS-B system was referenced to determine the conflicting aircraft's registration and type (the Yak 18).

The controller perceived the severity of the incident as 'Medium'.

THE WADDINGTON LARS CONTROLLER reports that they were under training in the Waddington LARS [position] for most of the morning, working at relatively high intensity. After a suitable lunch break, the instructor and [controller] re-took the LARS task. Shortly after 1300, [the pilot of the Yak 18] called Waddington LARS approximately 13NM east of WIT and asked for a Basic Service (BS). A BS and squawk were applied, and the regional pressure [setting] was passed. When [the pilot of the Yak 18] was approximately 5NM east of Bourne, the STCA flashed with a track 5NM NW indicating 500ft above. As the [Yak 18 pilot] was [under a] BS, Traffic Information was passed within 5NM and the pilot called 'looking'. The contacts merged with Mode C reading 600ft difference and the conflicting traffic then climbed rapidly. Traffic Information was then passed to CWL Approach to facilitate a MATZ overflight and the aircraft continued en-route.

Factual Background

The weather at Wittering was recorded as follows:

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METAR EGXT 271320Z 28005KT 9999 SCT035 BKN060 08/M01 Q1025 RMK BLU
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Analysis and Investigation

Military ATM

Utilising occurrence reports and information from the local investigation, outlined below are the key events that preceded the Airprox. Where available, they are supported by screenshots to indicate the positions of the relevant aircraft at each stage. The screenshots are taken from a combination of replays using both Unit and NATS radars. As NATS radars are not available to the controllers at Cranwell and Waddington they may not be entirely representative of the picture available, however, the Unit radars provide the exact radar view seen by the controllers.

The Cranwell Departures controller was providing a Traffic Service to two aircraft conducting general handling south of Cranwell, along with the Prefect also under a Traffic Service conducting a practice diversion to RAF Wittering. The Wittering Approach controller was expecting the Prefect for a practice diversion and was aware of the Prefect's position following a pre-note by the Cranwell Departures controller. The Waddington Zone controller was a trainee providing a Lower Airspace Radar Service to multiple civil aircraft and their workload for the session described as high.

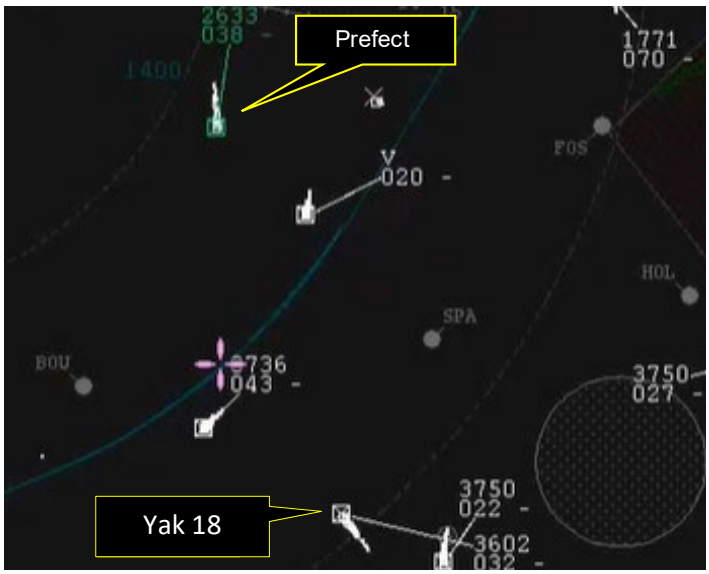


Figure 1 - 1310:16. Handover commenced by the Cranwell Departures controller.

At 1310:16, the Cranwell Departures controller commenced the handover of the Prefect to the Wittering Approach controller. Within the handover, previously called traffic was pointed out by the Cranwell Departures controller "*Has traffic southeast 3 miles tracking south squawking 7000*" (see Figure 1). The Wittering Approach controller acknowledged this traffic before pointing out further traffic at 1310:52 "*Roger, has further traffic left 11 o'clock 6 miles opposite direction squawking 3602 … indicating 600 feet below*".

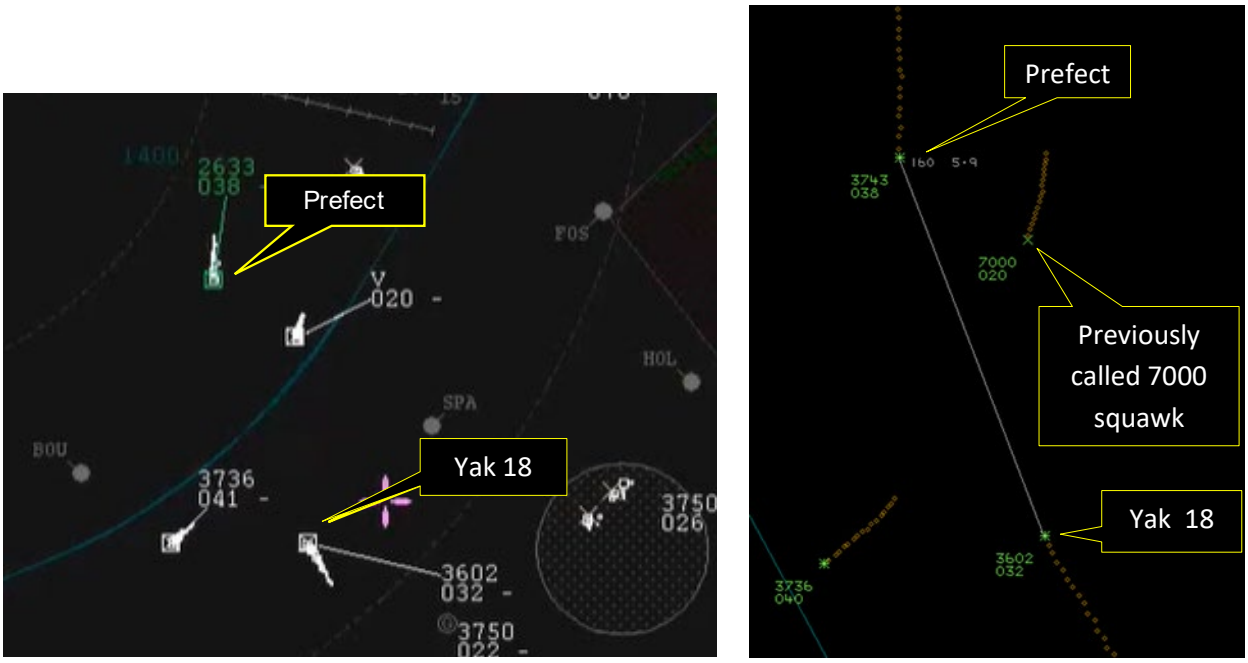


Figure 2 - 1310:59. Traffic Information was provided to the Prefect pilot on the Yak 18 by the Cranwell Departures controller. The separation was 6.8NM. Unit (left) and NATS (right) radar displays shown.

Prompted by the Wittering Approach controller's traffic point-out, at 1310:59 the Cranwell Departures controller provided Traffic Information to the Prefect pilot on the Yak 18 "*further traffic south southeast 6 miles tracking northwest indicating 600 feet below believed to be light civilian*" (see Figure 2). The Prefect pilot acknowledged the Traffic Information and reported "*not sighted*".

At 1311:16, the Cranwell Departures controller instructed the Prefect pilot to contact Wittering Approach.

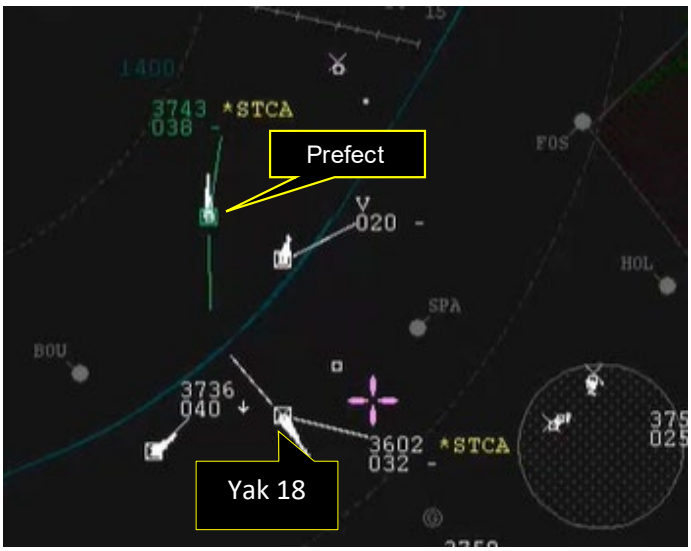


Figure 3 - 1311:19. Short Term Conflict Alert. The separation was 5.4NM.

At 1311:19, both the Cranwell Departures and Waddington Zone controllers received Short Term Conflict Alerts regarding the Yak 18 and Prefect (see Figure 3).

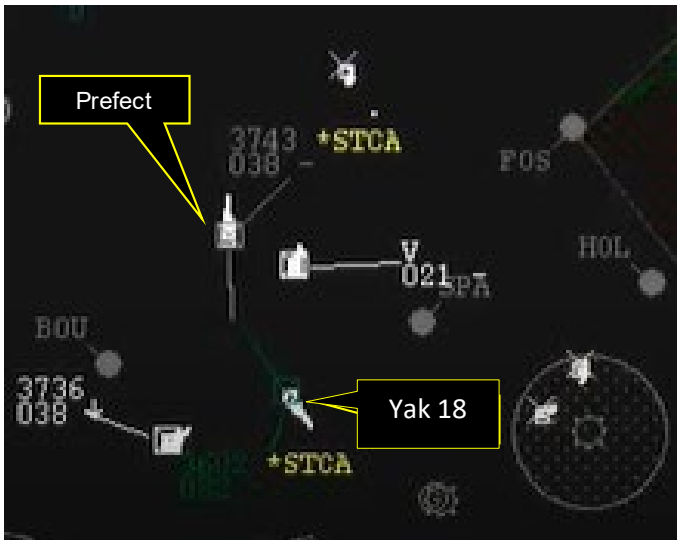


Figure 4 - 1311:30. Traffic information was provided to the Yak 18 pilot on the Prefect by the Waddington Zone controller. The separation was 4.5NM.

At 1311:30, the Waddington Zone controller provided the Yak 18 pilot with Traffic Information on the Prefect, "*Traffic er, northwest 5 miles tracking south, indicating 400 feet above*". No further Traffic Information was provided to the Prefect pilot, although the Cranwell Departures controller did correct the initial frequency readback by the Prefect pilot, instructing the Prefect pilot to contact Wittering Approach on the correct frequency at 1311:34.

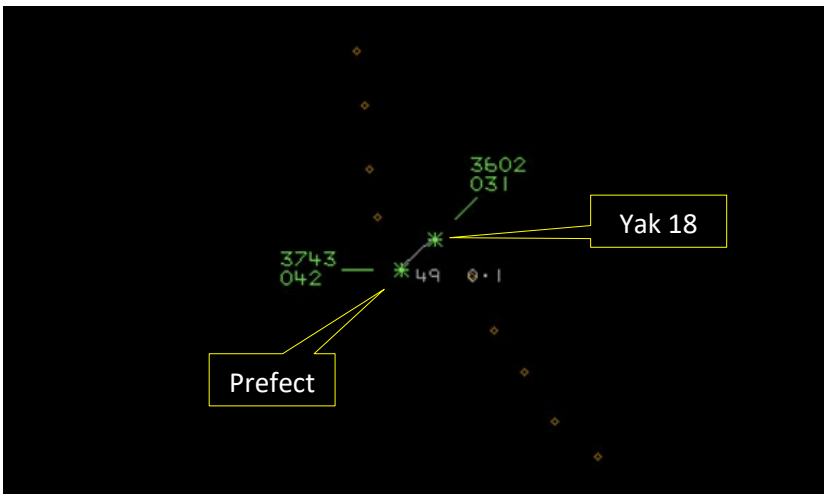


Figure 5 – CPA at 1312:34

CPA was measured at 0.1NM and 1100ft separation. On initial contact with the Wittering Approach controller at 1312:55, the Prefect pilot reported the Airprox.

The local investigation conducted by RAF Coningsby identified the cause of the Airprox as a loss of situational awareness by both the Prefect and Yak 18 pilots, with no deviation of course occurring until the Prefect pilot received a TAS alert. Several BM-related causal/aggravating factors were then identified that were believed to have contributed to the Airprox:

- Traffic Information was provided iaw CAP774 during the handover. However, because of an incorrect frequency readback, the extended handover prevented the Prefect pilot from receiving a Traffic Information update. Additionally, whilst reporting having not sighted the [Yak 18], the Prefect pilot did not request an update to the initial Traffic Information.

- Neither the Cranwell Departure nor Waddington Zone controllers requested Traffic Information from each other. The Cranwell Departure controller and Waddington Zone controller had been providing a Traffic Service and a Basic Service respectively iaw CAP774.

As a result of the causal factors identified, the following mitigation for local action was proposed:

- The requirement for aircrew to be fully cognisant of their responsibilities, with regards to the ATS (iaw CAP 774), to be positively addressed during Air Traffic Control liaison activities.

Analysis by 2 Gp BM determined that both the Cranwell Departures and Waddington Zone controllers provided Traffic Information iaw CAP774 for the services they were providing. At the point the Cranwell Departures controller initiated the handover, there was sufficient lateral separation to deem Traffic Information not yet relevant. However, as the handover progressed in a protracted manner, the Wittering Approach controller correctly pointed out the traffic. Due to the relative speeds and vertical separation, and with Traffic Information passed at a range of 6NM, the decision to complete the handover with an associated frequency change was deemed justifiable. This, based upon an assumption that providing the frequency change was conducted correctly, would have allowed sufficient time for the Wittering Approach controller to have updated the Traffic Information, if required, on initial contact. However, with the incorrect frequency readback introducing a delay, there was an opportunity for the Cranwell Departures controller to have either provided further Traffic Information or to have delayed the handover until the point of confliction had passed. The controller's decision to continue with the frequency change was however iaw CAP774 and was supported by the fact that the vertical separation had not changed and the Prefect pilot had not requested an update.

UKAB Secretariat

An analysis of the NATS radar replay was undertaken and both aircraft could be positively identified from Mode S data. An analysis of tape transcripts from the Cranwell Departures and Wittering Approach frequencies was undertaken.

Summarised timeline of events:

1309:03 The Cranwell controller passed TI to the pilot of the Prefect on [an uninvolved] contact at 5NM tracking SW, 2000ft below.

1310:16 The Cranwell controller telephoned the Wittering controller to hand-over the Prefect pilot.

1310:24 The Wittering controller advised the Cranwell controller of a new squawk for the Prefect pilot (3743) which was then relayed to the pilot.

1310:42 The Wittering controller advised the Cranwell controller that they had identified the Prefect.

1310:47 The Cranwell controller passed TI to the Wittering controller on the 7000 squawk tracking south (that had been called to the Prefect pilot at 1309:03).

1310:52 The Wittering controller passed TI to the Cranwell controller that the Prefect pilot had 'traffic left 11 o'clock 6 miles opposite direction squawking 3602, indicating 600ft below' This traffic had been the Yak 18.

1310:59 The Cranwell controller relayed the TI on the Yak 18 to the Prefect pilot (see Figure 2).

1311:13 The Prefect pilot advised they were 'not visual' with the traffic.

1311:19 An STCA alert was received by the Cranwell Departures and Waddington Zone controllers. The separation between the aircraft was 5.4NM.

1311:30 The Waddington Zone controller passed Traffic information to the Yak 18 pilot on the Prefect. The separation was 4.5NM

1311:45 The Prefect pilot left the Cranwell frequency.

1312:34 CPA occurred between the Prefect and the Yak 18 (see Figure 5).

1312:55 The Prefect pilot called on the Wittering frequency 'Wittering Approach, [Prefect callsign] report an Airprox'.

The Prefect and Yak 18 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.[1] If the incident geometry is considered as head-on or nearly so then both pilots were required to turn to the right.[2]

Comments

HQ Air Command

This was subject to a Local Investigation which made one recommendation. The event occurred when both crew members were eyes-in due to a teaching point on handover to Wittering. The trainee mis-heard the frequency passed and was attempting to manually dial it in to the UHF radio when in fact it was a studded [preset] frequency. The QFI was trying to intervene. During this period with heads-in, the TAS alerted and the Prefect pilot acted accordingly to increase separation by climbing and to gain visual contact with the other traffic. The Prefect pilot's observation that there may be an increasing reliance on TAS at the expense of TI calls from ATC is noted. TI calls should be the primary method for assisting crews to visually acquire the notified conflict and take measures to increase separation. Whilst the TAS did alert on this occasion, for reasons such as aerial shielding and non-transponding aircraft, it is not 100% guaranteed that TAS will pick up on notified traffic later

[1] (UK) SERA.3205 Proximity. MAA RA 2307 paragraphs 1 and 2.
[2] (UK) SERA.3210 Right-of-way (c)(1) Approaching head-on. MAA RA 2307 paragraph 13.

on. The Yak 18 pilot was able to gain visual contact with the Prefect thanks to TI from Waddington LARS, prompted by the Short Term Conflict Alert. They attempted to make themselves more noticeable by rocking their wings but, unfortunately, this was not seen by the Prefect pilot. A recommendation has been made to examine Prefect conspicuity, both visual and electronic (namely ADS-B in/out), through a platform safety enhancement.

AOPA

When operating in Class G airspace it is recommended to obtain the most comprehensive ATC service available to assist in MAC mitigation. It should be remembered that, under a Basic Service, ATC is not required to monitor flight progress or any potential conflict. In this case, the Waddington controller went above the requirements of CAP774.

Summary

An Airprox was reported when a Prefect and a Yak 18 flew into proximity 4.5NM west of Spalding at 1313Z on Monday 27th March 2023. Both pilots were operating under VFR in VMC, the Prefect pilot in receipt of a Traffic Service from Cranwell Departures and the Yak 18 pilot in receipt of a Basic Service from Waddington LARS.

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.

Members first considered the actions of the pilot of the Prefect and noted that Traffic Information had been provided on the Yak 18 when the separation between the aircraft had been approximately 6NM. Members acknowledged that the workload of the Prefect pilot had been relatively high and, just after they had been given this Traffic Information, their focus had been diverted to an imminent change of radio frequency. Members surmised that this diversion of focus to correct a misheard frequency may have caused the pilot of the Prefect to not have fully assimilated the Traffic Information regarding the Yak 18. Members pondered whether it would have been prudent for the pilot of the Prefect to have requested an update on the traffic situation, given that there had been a delay in leaving the Cranwell frequency. Notwithstanding, members noted that it had been the TAS fitted to the Prefect that had brought the Prefect pilot's attention back to the conflicting traffic and that the Prefect was then manoeuvred to aid visual acquisition of the Yak 18. Members agreed that the pilot of the Prefect had been concerned by the proximity of the Yak 18.

Turning their attention to the actions of the pilot of the Yak 18, members noted that they had been in receipt of a Basic Service and would therefore not necessarily have expected to have received Traffic Information. Nevertheless, the Waddington LARS controller had passed Traffic Information to the pilot of the Yak 18 on the Prefect. Members agreed that this information had enabled the pilot of the Yak 18 to have visually acquired the Prefect at a range of approximately 2NM and this had given them sufficient time to have considered the best course of action to maintain adequate separation. Members indicated that they had no further comments and next turned their attention to the Ground Elements.

Members considered the actions of the Cranwell controller. It was agreed that, having passed Traffic Information on the Yak 18 to the pilot of the Prefect when the separation had been approximately 6NM, their responsibilities under the terms of a Traffic Service had been correctly discharged. Some members suggested that, given that the Cranwell controller had been aware that the Prefect pilot had remained on their frequency, and that an impending STCA alert had been activated, that there had been an opportunity to have passed updated Traffic Information on the Yak 18 which may have been beneficial to the Prefect pilot. Members next noted that there had been good co-ordination between the Cranwell and Wittering controllers in the moments before their handover. Considering the actions of the Waddington LARS controller, members commended the passing of Traffic Information early enough for the pilot of the Yak 18 to have taken action to ensure adequate separation from the Prefect.

In conclusion, members were satisfied that the timely passing of Traffic Information to each pilot, and the TAS fitted to the Prefect that had alerted to the presence of the Yak 18, had enabled each pilot to have visually acquired the other. Members agreed that from the initial sighting of the Prefect, there had been sufficient time for the Yak 18 pilot to have ensured that there had been adequate separation between the aircraft. It was concluded that there had been no risk of collision and that normal safety standards had pertained. As such, the Board assigned Risk Category E to this event. Members agreed that the following factors (detailed in Part C) had contributed to this Airprox:

CF1. The Cranwell Departures and Waddington Zone controllers received Short Term Conflict Alerts regarding the Yak 18 and Prefect.

CF2. The pilot of the Prefect had been passed Traffic Information on the Yak 18 but had not fully assimilated the potential conflict.

CF3. The pilot of the Prefect had been concerned by the proximity of the Yak 18.

CF4. The TAS fitted to the Prefect had alerted the pilot to the presence of the Yak 18.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2023034			
CF	**Factor**	**Description**	**ECCAIRS Amplification**	**UKAB Amplification**
	Ground Elements			
	• Electronic Warning System Operation and Compliance			
1	Technical	• STCA Warning	An event involving the triggering of a Short Term Conflict Alert (STCA) Warning	
	Flight Elements			
	• Situational Awareness of the Conflicting Aircraft and Action			
2	Human Factors	• Understanding/ Comprehension	Events involving flight crew that did not understand or comprehend a situation or instruction	Pilot did not assimilate conflict information
3	Human Factors	~~• Unnecessary Action~~	~~Events involving flight crew performing an action that was not required~~	Pilot was concerned by the proximity of the other aircraft
	• Electronic Warning System Operation and Compliance			
4	Contextual	• Other warning system operation	An event involving a genuine warning from an airborne system other than TCAS.	

Degree of Risk: E.

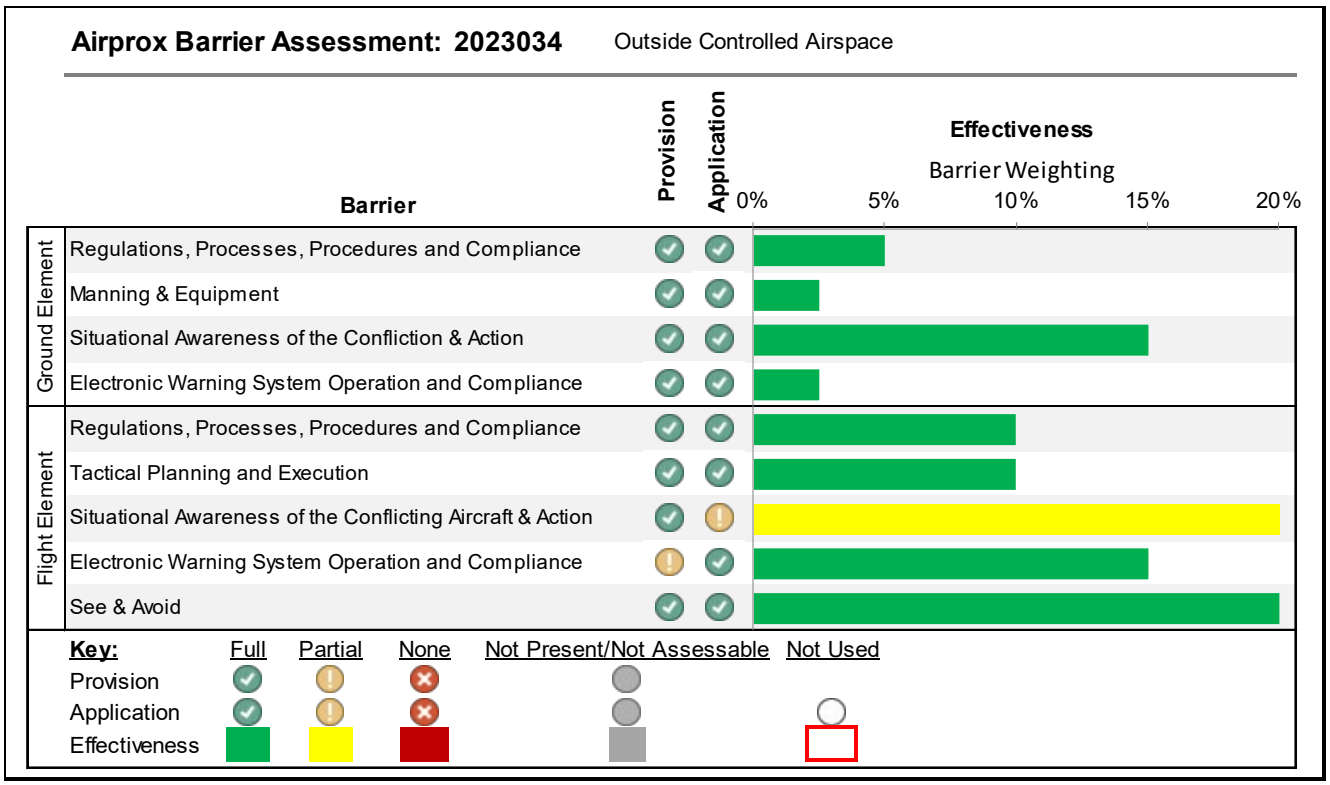
Safety Barrier Assessment[3]

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

Flight Elements:

Situational Awareness of the Conflicting Aircraft and Action were assessed as **partially effective** because the pilot of the Prefect had been passed Traffic Information on the Yak 18 but had not fully assimilated the potential conflict.

[3] The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the UKAB Website.


Airprox Barrier Assessment: 2023034
Outside Controlled Airspace
Barrier
Provision
Application
Effectiveness
Barrier Weighting
0%
5%
10%
15%
20%
Ground Element
Regulations, Processes, Procedures and Compliance
Manning & Equipment
Situational Awareness of the Confliction & Action
Electronic Warning System Operation and Compliance
Flight Element
Regulations, Processes, Procedures and Compliance
Tactical Planning and Execution
Situational Awareness of the Conflicting Aircraft & Action
Electronic Warning System Operation and Compliance
See & Avoid
Key:
Full
Partial
None
Not Present/Not Assessable
Not Used
Provision
Application
Effectiveness