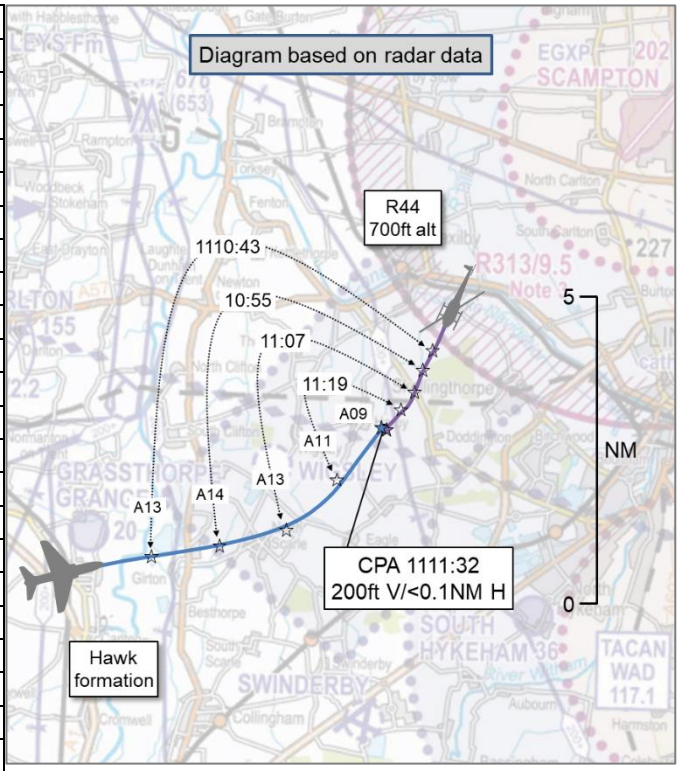
AIRPROX REPORT No 2021095

Date: 26 Jun 2021 Time: 1112Z Position: 5313N 00040W Location: 6NM SW Scampton

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Hawk	R44
Operator	HQ Air (Ops)	Civ Helo
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	Traffic/Basic[1]	Basic
Provider	Scampton Tower	Scampton Tower
Altitude/FL	900ft	700ft
Transponder	A, C only	A, C, S
Reported		
Colours	Red	Blue
Lighting	HISL, landing	Nav, strobe
Conditions	VMC	VMC
Visibility	5-10km	5-10km
Altitude/FL	500ft	500ft
Altimeter	QFE (1012hPa)	QFE (NK hPa)
Heading	042°	210°
Speed	330kt	90kt
ACAS/TAS	Not fitted	TAS
Alert	N/A	TA
Separation		
Reported	<150ft V/<100ft H	500ft V/1NM H
Recorded	200ft V/0.1NM H	



THE HAWK PILOT reports that the Royal Air Force Aerobatic Team (RAFAT) [the Red Arrows] was conducting a transit to RAF Scampton, including a flypast. They were the sortie navigator, responsible for planning, airborne navigation and ATC communication on behalf of the Team leader. The sortie was planned and conducted iaw RAFAT SOPs and a pre-sortie CADS check showed no conflicts; Pipeline Inspection aircraft were notified as not active. The sortie had been busy with significant GA traffic in the area of the departure airfield and poor weather in the Midlands area, however, the flypast was conducted as tasked. Post flypast, Red 1 flowed along the NOTAM'd planned route for recovery to Scampton where Waddington ATC is the usual provider for an ATC service when departing from, or recovering to, Scampton. However, due to the current agreement between RAFAT and RAF Waddington for weekend operations, Waddington ATC was stood down because the forecast weather for the recovery was WHT/BLU[2]. Therefore, the only option for a radar service for recovery from the south at low-level was with East Midlands. The recovery was initiated 10NM west of Newark and at that time the formation held a reduced Traffic Service (due to limits of radar performance and formation altitude) from East Midlands Radar. Approaching the edge of their radar coverage, about 15NM from Scampton, They were informed of 5 contacts 5-8NM west of Scampton. Altitude information was provided for 2 of the 5. They asked for a position update which was provided for the nearest 2 contacts. All Traffic Information was relayed to Red 1 and the rest of the formation on UHF R/T frequency. Shortly after this, on a bearing of about 220°/4NM from Scampton, they became visual with a light aircraft in the right 1 o'clock high position that was not a confliction. The position of this traffic correlated with one of the contacts called by East Midlands Radar and was called almost simultaneously to Red 1 by another formation member who was also visual with it. At virtually the same time they saw a helicopter, slightly low, opposite track which passed underneath the right hand side of the rear section (comprising Reds 6-10, in 0.5NM trail on the front section of Reds 1-5). There was no time to call the traffic or take

[1] During the course of the Airprox, RAFAT was in the process of terminating a Traffic Service with East Midlands.
[2] Waddington ATC will only be called in at the weekend to provide a service for RAFAT departures and/or recoveries when the actual or forecast weather is GRN or worse.

avoiding action. The helicopter appeared to be dark blue in colour with some yellow markings (possibly one of the blades painted yellow). The helicopter passed closest to Red 10 and was assessed visually as having very little lateral separation, 150ft below. The pilot assessed other relevant factors to be that they had no radar service, no on-board collision avoidance system or radar and that there is no radar feed to Scampton Tower.

Another formation member was nominated to contact Scampton Tower on recovery, iaw RAFAT SOPs. They called ahead, whilst the reporting Hawk pilot maintained communications with East Midlands Radar, and was provided information on the helicopter which was relayed to the rest of the formation on a UHF radio frequency. The traffic was called as just outside the ATZ, bearing 270° from Scampton at approx. 3-4NM. They were also informed that the traffic was heading south and had been requested to be below 500ft on the Scampton QFE. The other formation member contacted Scampton Tower on 125.35MHz, the helicopter traffic was on 122.1MHz so all position reports from the helicopter were being relayed via Scampton Tower.

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

THE R44 PILOT reports that rather than making the assumption they were closed on a Saturday, they spoke to Scampton Tower to request a transit through the western side of their ATZ. This was granted and the pilot was informed the Red Arrows were inbound with 10min to run and were on frequency. On leaving the ATZ on a southerly heading, the R44 pilot began a descent to deconflict with the inbound Red Arrows. The pilot was informed of their location, altitude and heading. The R44 pilot saw them at a range of 3NM, where they were expected to be and where they had been advised as being, at which point the pilot was on final descent to a landing site. The Red Arrows passed down the right side about 500ft above. No avoiding action was required because the R44 pilot was in contact with Scampton Tower, knew where they were coming from and at what altitude, and the Red Arrows knew the R44 pilot's heading and altitude.

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

THE SCAMPTON TOWER CONTROLLER reports that Waddington Radar had not been called in as the weather was BLU/WHT and fit VFR recoveries. This was unknown by Scampton ATC until after opening the Tower for the RAFAT recovery. As such, the controller had no awareness of any radar tracks nor were they able to receive any 'warning in' calls [from Waddington radar]. Indeed the only information received prior to recovery was that RAFAT was delayed by about 10min on departure and the POB for each aircraft. An R44 helicopter pilot free-called on 122.100MHz stating he was positioned to the west by about 3 miles at 900ft and wished to transit the edge of the ATZ to the west. The controller was not speaking to RAFAT, had not received a 'warning in' call from any other unit and did not see an issue at first, so told the pilot the transit was approved. The pilot was also informed that RAFAT were expected to recover in about 10-15min and asked if they would be 'out of the way'. The pilot stated they would be clear of the area in 5min and was also happy to accept a descent. A few minutes later, RAFAT checked in on 125.350MHz and requested the airfield details. The controller asked the helicopter pilot to be not above 500ft on Scampton QFE which was acknowledged, but could not see the helicopter at that point. Information was passed to the helicopter on RAFAT, including last reported position and height. A minute or so later RAFAT asked for an update at which point the helicopter was in sight, visually assessed and relayed as approximately Scampton 270° at 3.5-4 miles and not above 500ft (there is no radar feed in the Scampton Tower). At this point RAFAT was over 20 miles away from Scampton. RAFAT requested that the helicopter pilot report outside of 5 miles. Again, the helicopter pilot obliged, reported outside of 5 miles, that they were also visual with the Red Arrows and then went en-route. The controller was surprised when RAFAT stated they had come so close to the helicopter because they had expected RAFAT to remain not below 1000ft QFE until within the circuit at Scampton and/or visual with the helicopter. Waddington ATC would ordinarily activate R313 for the RAFAT recovery and it was not something that Scampton ATC would routinely do. The controller felt that perhaps on this occasion they should have initiated [R313 activation] but would have done this only once they knew RAFAT was inbound and therefore it was highly unlikely it would have prevented the helicopter from appearing in the position it did. Given that RAFAT would have placed a NOTAM in the system for this sortie, the controller expected that the helicopter pilot would have been aware of their

impending recovery profile and timings. Post event, Waddington ATC confirmed that if they had been called in to provide a radar service they would not have activated R313 for recovery.

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

THE SCAMPTON ATCO I/C was also the controller.

Factual Background

The weather at Waddington was recorded as follows:

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METAR EGXW 261150Z AUTO 05009KT 9999 OVC018/// 16/11 Q1020=
METAR EGXW 261050Z AUTO 04009KT 9999 OVC016/// 15/10 Q1020=
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The Red Arrows formation transit NOTAM was distributed as follows:

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Q) EGTT/QWVLW/IV/M/W/000/030/5212N00048W072
FORMATION TRANSIT BY RED ARROWS ACFT ROUTING:
511633N 0004627W FARNBOROUGH AD 1027
511028N 0004115W S OF ELSTEAD 1029
510621N 0010234W VCY OF FOUR MARKS 1031
512341N 0012744W W OF KINTBURY 1035
513057N 0015138W SE OF WOOTON BASSETT 1038
514913N 0020242W SE OF COWLEY 1041
521258N 0005557W VCY OF BANBURY 1046
521258N 0005557W VCY OF NORTHAMPTON 1049
524246N 0005504W N OF TWYFORD 1054
524328N 0010526W SE OF SILEBY 1055
524332N 0011858W E OF COALVILLE 1057
524338N 0013314W S OF SWADLINCOTE 1058
524339N 0014340W NATIONAL ARBORETUM FP 1100
524343N 0015738W SW OF RUGELEY 1101
525214N 0015841W NE OF HIXON 1103
530429N 0011413W ANNESLEY WOODHOUSE 1108
530508N 0010427W SW OF FARNSFIELD 1109
531828N 0003303W SCAMPTON AD 1113
FORMATION PLANS TO TRANSIT AT 250-2000FT AGL.
TIMINGS, HGT AND ROUTE ARE APRX AND MAY CHANGE DUE TO WX OR OTHER REQUIREMENTS.
2021-06-0571/AS1
LOWER: SFC UPPER: 3000FT AMSL
26 JUN 2021 10:15 FROM: 26 JUN 2021 11:25
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Analysis and Investigation

Military ATM

An Airprox occurred on 26 Jun 21 at approximately 1111UTC, 6NM southwest of RAF Scampton between a formation of Hawks and an R44. Neither aircraft was in receipt of a radar service, but both were in communication with Scampton ATC.

The Hawks were on return to Scampton from a flypast tasking and were in communication with Scampton ATC and East Midlands at the time of the Airprox. They had been in receipt of a reduced Traffic Service from East Midlands and had received Traffic Information regarding 5 tracks operating 5 – 8NM west of Scampton, with altitude information being provided for 2 of the tracks. They reported that they became visual with one of the called contacts and shared the Traffic Information throughout the formation. The R44 was spotted almost immediately after, however, it was reported that due to the proximity there was no time to pass Traffic Information to the formation. Another formation member was in contact with Scampton ATC who had been provided Traffic Information on the R44

and advised them that the R44 pilot had been requested to be below 500ft QFE. Separation was reported as less than 100ft laterally and less than 150ft vertically.

The R44 pilot reported that they contacted Scampton ATC to request an ATZ transit which was approved en route to their landing aerodrome. They were given information relating to the recovery of the Hawks and after leaving the ATZ they reported receiving updated Traffic Information. The R44 pilot was visual with the Hawk formation while it was in its descent to its landing aerodrome and reported separation as 500ft vertically and 1NM horizontally.

The Scampton Aerodrome Controller reported that they only became aware that there was no radar provision from Waddington ATC for the recovery of the Hawks after they had opened the airfield, therefore they had no radar information of any ATZ transits. The R44 pilot free-called Scampton ATC requesting a transit of the ATZ to the west, which was approved along with information that a formation of Hawks was due to recover in approximately 10 – 15 minutes. They reported that they would be clear of the ATZ in 5 minutes and would accept a descent if required. After a short while the Hawks contacted Scampton ATC requesting the airfield details and the R44 pilot was advised that the Hawks were on recovery. The R44 pilot provided an update on their position and offered to descend, reporting that they were level at 500ft on Scampton QNH [the R44 pilot had already been passed QFE. Although not visual, the controller passed the last known position of the R44 to the Hawks at their request. Traffic Information was updated at the request of the Hawks which was derived from visual contact with the R44 pilot but not radar derived information. The R44 pilot was requested to report outside of 5NM which they complied with, reporting that they were visual with the Hawks before they went en-route.

Figures 1 – 4 show the positions of the Hawks and the R44 pilot at relevant times during the Airprox. The screen shots are taken from a replay using NATS radars, which are not utilised by Scampton as Scampton has no radar provision.

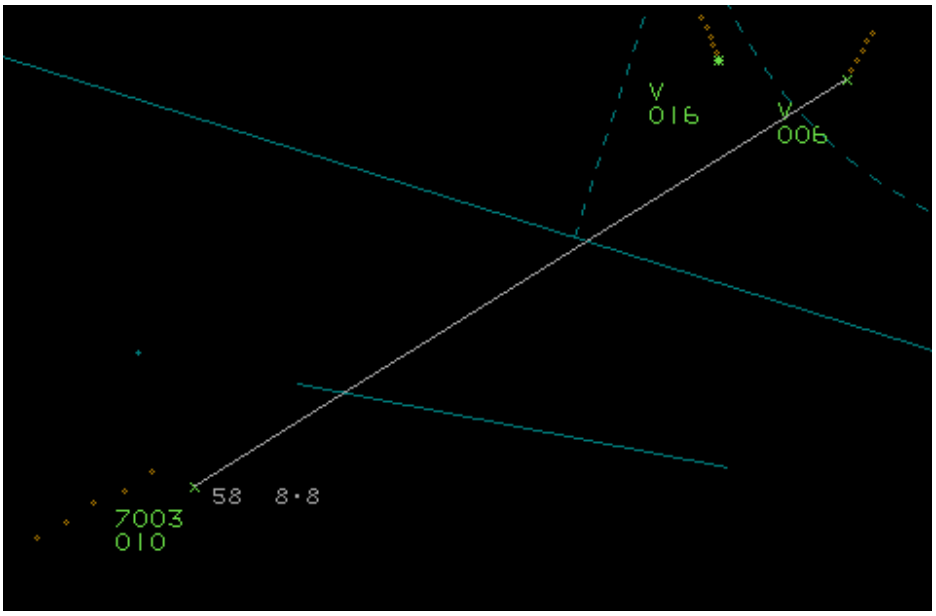


Figure 1: Separation measured at 8.8NM and 400ft

As the radar replay progressed the separation continued to decrease.

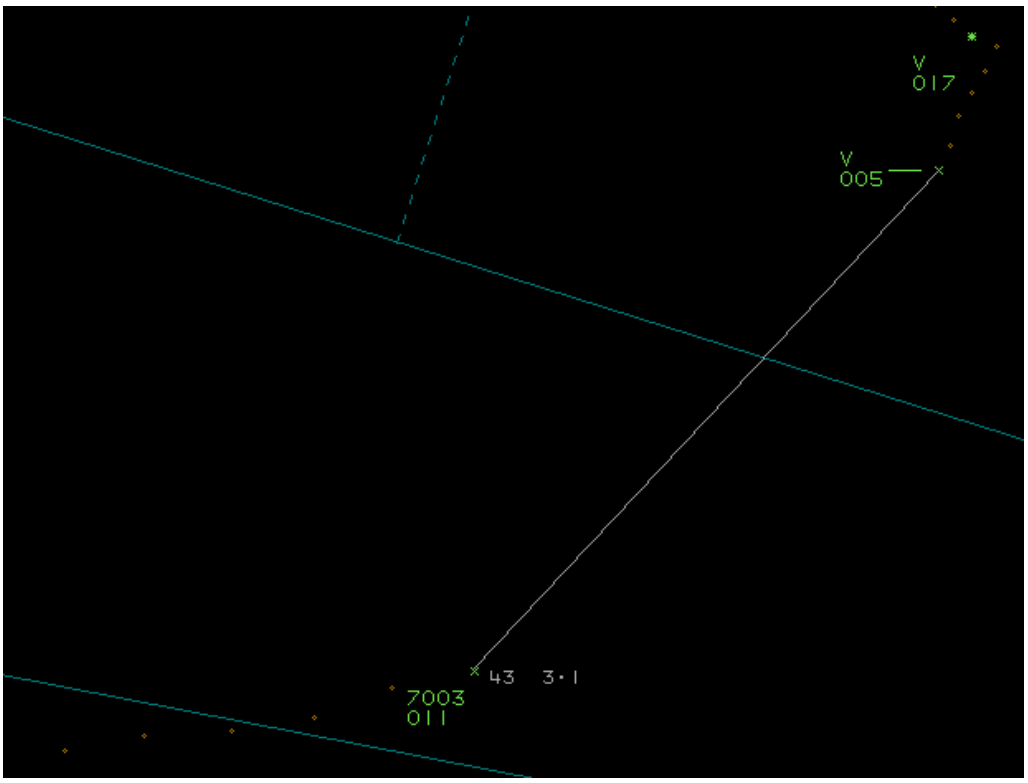


Figure 2: Separation measured at 3.1NM and 600ft

As the Hawks continued to transit towards the Scampton ATZ separation continued to decrease.

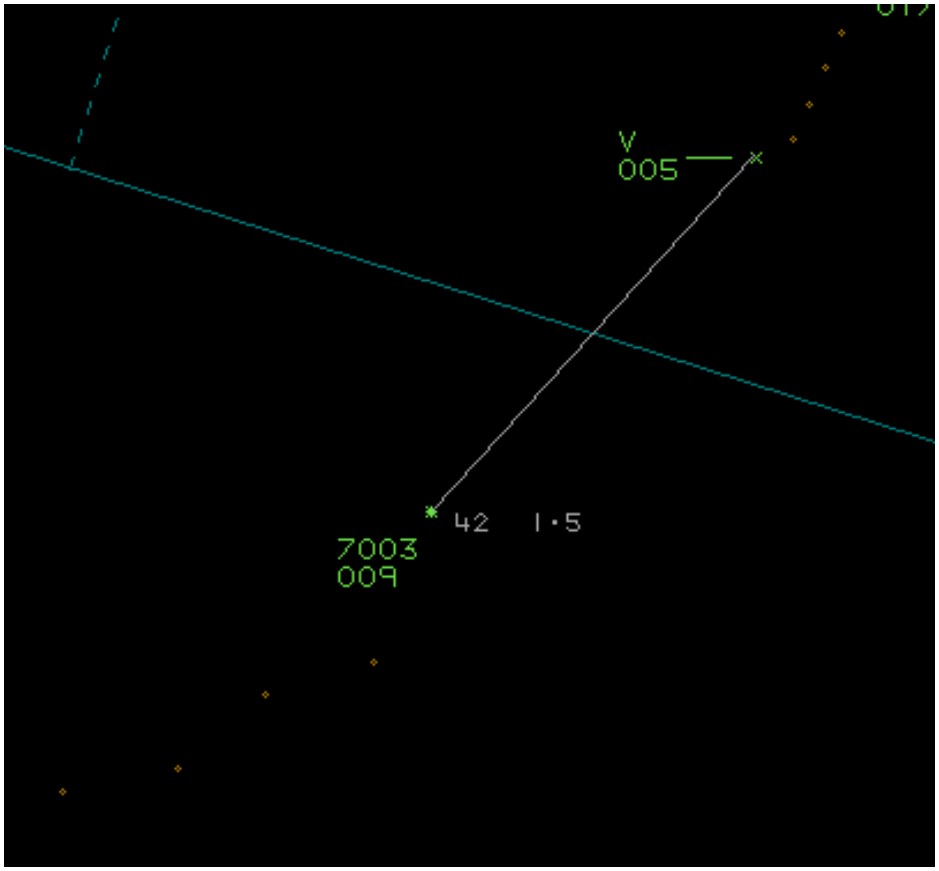


Figure 3: Hawks begin to descend

The Hawks appear to descent from their steady level of 1000ft. Separation was measured at 1.5NM and 400ft.

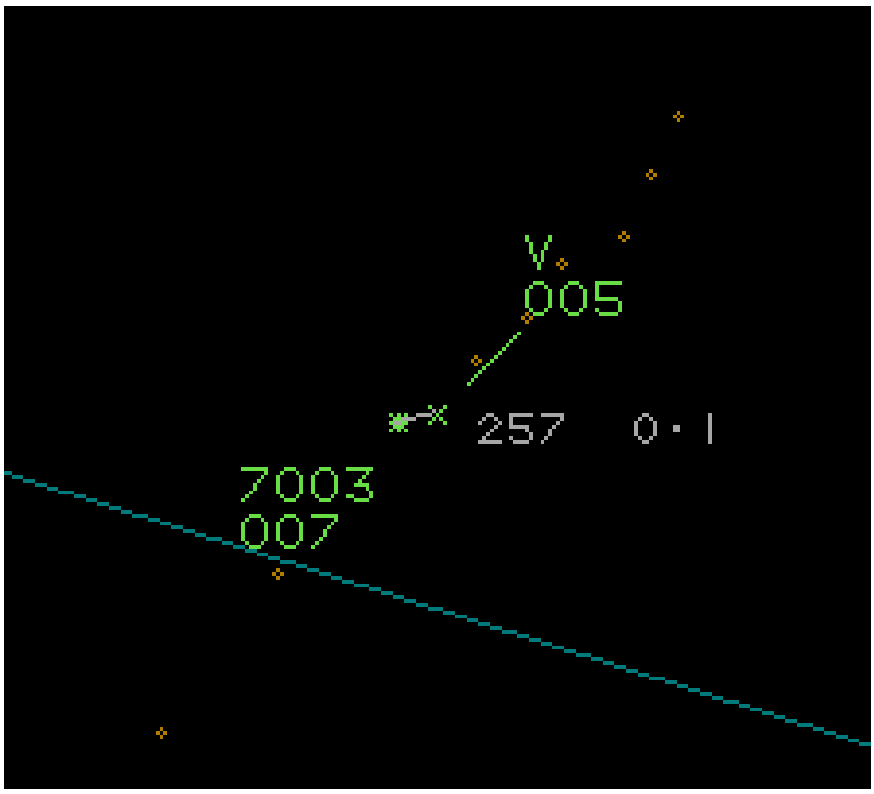


Figure 4: CPA

CPA was measured at 0.1nm and 200ft.

The Scampton controller had limited information regarding the expected recovery of the Hawks, other than that they were 10min late departing and would not receive a "warning inbound" call due to Waddington ATC being closed. When the R44 pilot requested a transit of the ATZ it was approved, although the controller had limited knowledge of the routing having not confirmed a location or destination. They did, however, get confirmation that the R44 was going to be outside the ATZ prior to the expected recovery of the Hawks and provided the R44 pilot with updates when able. The Scampton controller reported that they were surprised that the separation between the Hawks and the R44 had reduced enough to trigger an Airprox as they expected the Hawks to remain not below 1000ft QFE until they joined the Visual Circuit in accordance with the Flying Order Book. The Controller also advised the Hawks that the R44 pilot was transiting at 500ft and if they joined at circuit height then it was expected to be no factor.

The Hawks and the R44 pilot were operating on different frequencies, therefore, both were reliant on Scampton ATC to pass Traffic Information. Having both on the same frequency where possible would have potentially provided more information, however, both had been given as accurate information as could be given in the absence of radar support.

The unit investigation found that the suggestion to join at circuit height was not passed from the Hawk that was conducting RT calls with Scampton ATC to the formation lead which resulted in the formation lead believing there was no restriction. Had they known about the restriction they would not have committed to the circuit at that time as a large formation join, as per the Flying Order Book, was never practised.

Waddington ATC would normally provide an ATS to LARS transits and inbounds to Scampton, however, local orders for weekend operations stipulate that Waddington will only support when the weather is colour code Green or worse, therefore, they had been stood down as not required by the Hawks on this occasion.

The R44 pilot elected to descend to 500ft to support the recovery of the Hawks and should be commended for their flexibility. Had the suggested height for join been passed to the formation lead

then perhaps the formation lead would have opted to remain at 1000ft until the formation was visual with the R44 or until they were inside the MATZ.

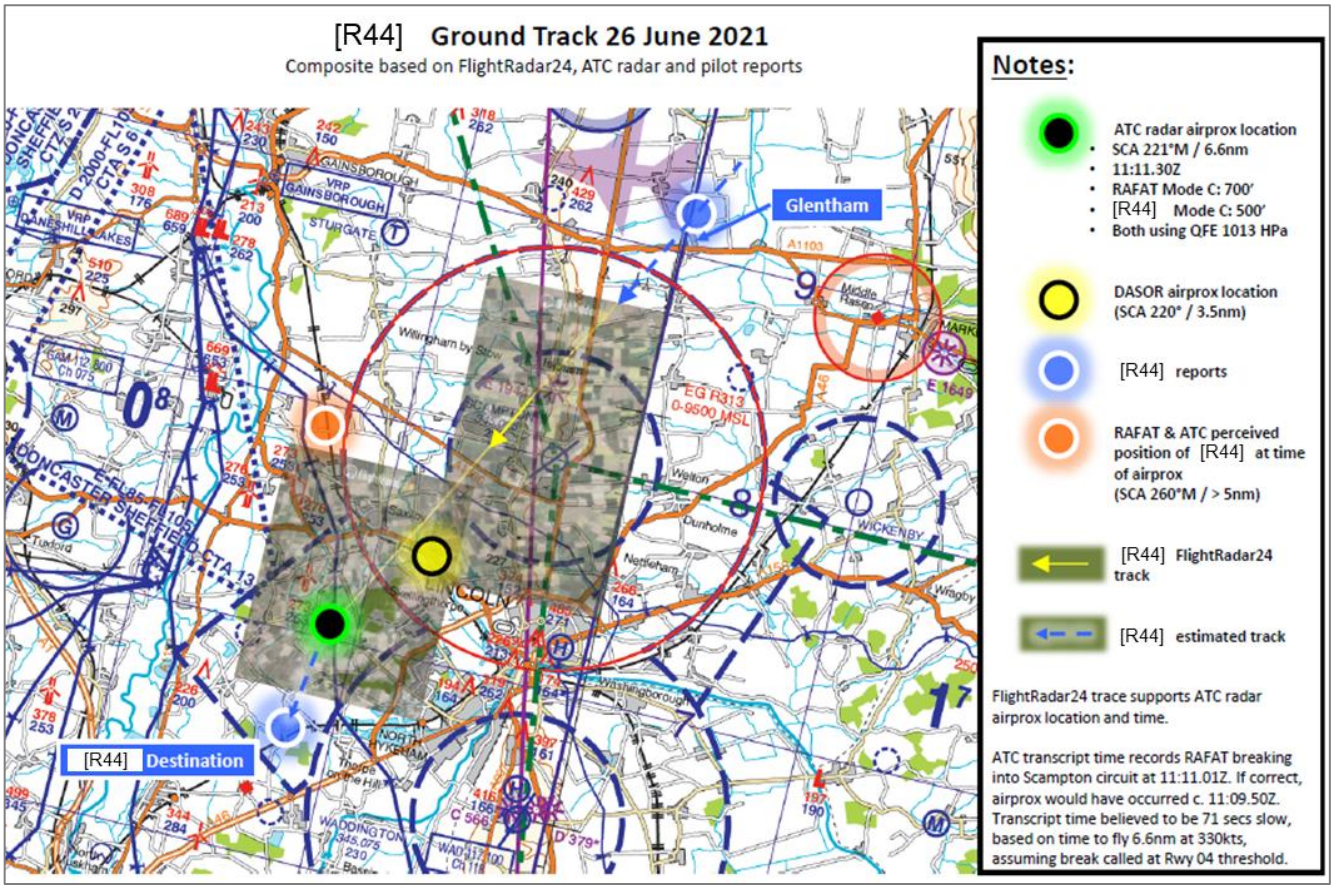
UKAB Secretariat

The Hawk and R44 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.[3] If the incident geometry is considered as head-on or nearly so then both pilots were required to turn to the right.[4] Formations of aircraft are normally less manoeuvrable than single aircraft and are unable to take sudden avoiding action. The handling Pilots of single aircraft should therefore give way to, and keep clear of, Formations of aircraft.[5]

The UK AIP ENR 5.1 (PROHIBITED, RESTRICTED AND DANGER AREAS) defines the restricted area around RAF Scampton, EG R313, as follows:

EG R313 SCAMPTON A circle, 5 NM radius, centred at 531828N 0003303W	Upper limit: 9500 FT ALT Lower limit: SFC	Contact: Information on the Red Arrows training may be obtained from ATC Scampton, Tel: 01522-733055, or by radio to Waddington Zone on 119.500 MHz/232.700 MHz. Non-radio aircraft may be able to obtain a pre-flight clearance by telephone to ATC Waddington 01522-727451 / 727452. SI 2016/14. Hours: Restrictions are in force Mon-Fri 0830-1700 (0730-1600) and when otherwise notified by NOTAM whenever the Red Arrows are carrying out formation aerobatic and display training.

Occurrence Investigation



The Scampton Occurrence Investigation characterised the outcome as follows:

> A 10-ship RAFAT formation and an R-44 helicopter converged in Class G airspace on reciprocal headings. RAFAT pilots assessed minimum separation as 100ft laterally; 150ft vertically. Evasive action was not

[3] (UK) SERA.3205 Proximity. MAA RA 2307 paragraphs 1 and 2.
[4] (UK) SERA.3210 Right-of-way (c)(1) Approaching head-on. MAA RA 2307 paragraph 13.
[5] MAA RA 2307 paragraph 9.

required but, had it been, the pilots opined that there would have been insufficient time to take it. The RAFAT formation leader did not sight the R-44. The R-44 pilot was visual with RAFAT throughout and did not assess that safety was compromised.

With the cause that:

The RAFAT formation leader descended towards the R-44 due to an incomplete mental model of its position and heading, leading him to conclude that it would not be a factor during RAFAT's recovery to RAF Scampton. Although visual with RAFAT throughout, the R-44 pilot did not perceive a risk of collision, so did not attempt to increase separation.

A total of 5 contributory factors were established:

1. Lack of Waddington ATC staffing.
   The occurrence prompted an immediate review of ATS provision for weekend RAFAT movements. Henceforth it was agreed that Waddington ATC would open routinely for departures and recoveries. If not possible, a bespoke risk assessment would be conducted, considering factors such as weather, time of day, anticipated traffic levels and possible mitigations.
2. Lack of an Air Traffic Monitor at Scampton
   RAF Scampton had previously submitted bids for an ATM in the tower but these proved unsuccessful. This occurrence prompted renewed discussion re. SA aids for Scampton ATC controllers. The ATM bid was reinvigorated but discontinued when it became apparent that funding approval was unlikely. Notwithstanding the merits of enhancing controller SA at Scampton, routine opening of Waddington ATC for weekend RAFAT movements will mitigate many of the causal factors identified in this report.
3. Lack of TAS on the Hawk.
   Since this occurrence, RAFAT have received clearance to use [an ADS-B system] combined with a kneeboard-mounted [display] to enhance SA on non-aerobatic sorties. The arrangement was previously used successfully during the 2019 RAFAT North American tour. Further work is underway to clear [a development of the ADS-B system], which will also display FLARM contacts.
4. Scampton FOB join height ambiguity.

   An airprox between RAFAT and an R-44 helicopter revealed a potential ambiguity in the RAF Scampton Flying Order Book (FOB) wrt circuit joins. Order D-10 stipulates: "A standard join is to be flown through the IP at the intended circuit height" and lists circuit heights for normal (1,000ft), glide ("as required") or low-level (500ft) circuits, or a visual run-in-and- break (VRIAB) ("300 ft run in, climb during break to circuit height"). Unlike some stns, the FOB does not require pilots to request non-normal circuits on approaching the Initial Point, implying that any type of circuit may be flown unannounced, provided the join is flown at the correct height. In the subject airprox, the tower controller had assumed that the absence of a request to fly a VRIAB indicated an intent to fly a normal circuit, contributing to a LOSS with the helicopter when RAFAT subsequently descended below 1,000ft.
5. Lack of clarity on the R44 pilot's intended routeing.
   The tower controller's actions were predicated on an incomplete mental model resulting from being required to coordinate a MATZ crosser against RAFAT's recovery with minimal information. The occurrence prompted valuable discussion and learning among Scampton ATC personnel, highlighting the imperative to clarify vague or incomplete radio messages.

A recommendation was made in response to contributory factor 4:

It is recommended that the FOB be amended to either:- Clarify that any type of circuit may be flown unannounced, provided the join is flown from the IP at the correct height, or stipulate that any type of join, other than for a normal circuit, is to be requested on approaching the IP. In the case of the latter, it is further recommended that a separate "RAFAT Join" be included in the FOB, to permit large formation VRIAB to be performed without additional radio calls.

A total of 2 aggravating factors were established:

1. The aircraft were on different VHF frequencies.

Whilst acknowledging the benefits of having all traffic on the same frequency for SA, there are circumstances in which it can prove detrimental in a large formation. RAFAT radio SOPs are designed to reduce distraction at critical phases of flight. Notwithstanding, the provision of a Waddington ATS for weekend RAFAT moves will significantly mitigate this issue.

2. Weekend traffic density resulting in an increased workload.

GA traffic is an unavoidable fact of life for RAFAT transits, which necessarily take place during Summer weekends at 2,000ft and below. Clearance of [an ADS-B system] will provide enhanced SA during transits, helping pilots to direct their lookout and acquire proximate traffic more quickly. [a development of the ADS-B system] will enhance this capability by displaying FLARM contacts in addition to transponding traffic.

Finally, the investigation observed that R313 was not activated, contrary to the Team's belief at the time, implying an expectation of sanctuary which was, in fact, absent.

Comments

HQ Air Command

This incident was subject to a detailed Local Investigation. The occurrence was the result of many contributory factors that combined; if one had been absent, it is quite probable the Airprox may not have occurred. As per standard agreement for the RAF Aerobatics Team (RAFAT) recoveries at the weekend, Waddington ATC was closed and not required to be open as the weather was forecast as WHT or better. The controller, therefore, did not have a radar feed to give precise location of the R44 (nor RAFAT) to relay to RAFAT. The position features passed by the R44 were either vague or unfamiliar to the controller and the R44's position was misconstrued as further west than in reality. This incorrect mental model of the R44's position was passed to RAFAT and, with the R44 not communicating on the same frequency, it could not be passed directly, nor refined. R313 was not active; its published hours are weekdays only and when activated by NOTAM. There was an incorrect assumption that a NOTAM had been submitted for activation on this day; if it had, the R44 pilot would have chosen alternative routeing which may have influenced the outcome of this occurrence. The Scampton Flying Order Book (FOB) defines a standard join as flown through the Initial Point at the intended circuit height but then lists 3 differing heights for different types of circuit. It does not mandate a radio transmission to verbally request or confirm the intended circuit type (and height). The controller expected RAFAT to maintain 1000ft agl for their join and deconfliction with the R44 would therefore be achieved by height. RAFAT's standard join is a visual run-in-and-break, lower than 1000ft agl. During the join, RAFAT unwittingly descended towards the R44 due to an incomplete mental model of its position and heading. The sighting of the R44 startled the pilot but evasive action was not required. Following the investigation, several recommendations have been made to address the contributory factors listed above. The occurrence prompted an immediate review of Waddington ATC provision for weekend RAFAT movements and it has been agreed that Waddington will open routinely for RAFAT departures and recoveries whenever possible. The process for activating R313 at the weekends has been reviewed and formalised and the FOB circuit join procedure is being reviewed.

Summary

An Airprox was reported when a Hawk formation and an R44 flew into proximity 6NM southwest of RAF Scampton at 1112Z on Saturday 26th June 2021. All pilots were operating under VFR in VMC, the Hawk pilots in receipt of an ACS and the R44 pilot in receipt of a Basic Service, both from Scampton Tower but on different frequencies.

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 discussed the Scampton controller's actions and agreed that they had attempted to effect deconfliction between the R44 and RAFAT but that this had not been successful. Members were of the opinion that a number of factors contributed to a complex safety picture and were grateful for the comprehensive and thorough Scampton Occurrence Investigation, which shed much light on the matter. The Scampton controller was operating without the benefit of a radar picture (**CF4**) due to Waddington personnel limitations (**CF3**) which materially limited their SA (**CF7**). Moreover, Scampton and RAFAT regulations appeared not to be completely aligned, in that there was no requirement to notify a controller of the height at which a run-in-and-break would be made (**CF1**,**CF8**). The controller was therefore unaware of RAFAT intentions and could not intervene. Members also agreed that a common VHF frequency would likely have mitigated the Airprox and that while an unpublished RAFAT VHF Tower frequency was no doubt of benefit for RAFAT operations, it detracted from the wider safety picture (**CF1**). Members noted that the Scampton controller did not establish the R44 pilot's routing (**CF2**) and thought that, in the absence of a radar picture, this action would have contributed to the controller's SA such that a better deconfliction plan could have been effected. Unfortunately, the situation was exacerbated by the controller's choice of words for Traffic Information (**CF5**) on the R44, as '… five hundred feet to the west of the airfield at the moment, just transiting the edge of the ATZ', to which the RAFAT member asked 'Which direction is that helicopter going?' and was told 'He's er transiting out to the west. …'. The Board agreed that this generated an incorrect mental model in the RAFAT member's mind that the R44 was heading west. The controller's next remark 'He's just left the ATZ so er if you join at circuit height he should be no factor' was not perceived as deconfliction advice (**CF13**) because the RAFAT member's SA did not place the R44 in their path. In addition, due to differing RAFAT and Scampton SOPs, the controller's mental model of 'circuit height' was not shared by the RAFAT member. Ultimately, the RAFAT member did not pass on the controller's advice to remain at circuit height (i.e. 1000ft) to RAFAT leader. With the controller expecting RAFAT to join at 1000ft they were understandably concerned by the proximity within which the aircraft subsequently passed each other (**CF6**). The RAFAT leader was passed the incorrect SA of the R44 position and intentions (**CF12**) and was not able to assimilate the impending confliction (**CF13**). The Board thought that an explicit declaration of the planned break height would also likely have prompted further deconfliction advice from the controller (**CF9**) but in the event, RAFAT lacked sufficiently accurate SA to change their plan (**CF10**). The Board also noted that RAFAT incorrectly believed that R313 was active for their return (**CF11**) and thought that this may have contributed to a false sense of sanctuary.

For their part, the R44 pilot was unconcerned by the RAFAT join, had offered to remain below 500ft and saw the formation as it approached. Members thought that, given the reported first sighting at a range of 3NM, radar separation at CPA and the R44 TAS alert (**CF14**), they would have been better placed by turning away to increase separation (**CF15**) for the benefit of RAFAT. In the event, the RAFAT member closest to the R44 did not see it (**CF16**) and the Board discussed whether safety had been much reduced or to what degree the R44 pilot's sighting and SA had contributed to a situation in which effective action had been taken. The Board eventually decided that although the situation had been far from ideal, in this instance risk of collision was averted.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2021095			
CF	**Factor**	**Description**	**ECCAIRS Amplification**	**UKAB Amplification**
	Ground Elements			
x	**• Regulations, Processes, Procedures and Compliance**			
1	Organisational	• Aeronautical Information Services	An event involving the provision of Aeronautical Information	The Ground entity's regulations or procedures were inadequate
2	Human Factors	• ATM Regulatory Deviation	An event involving a deviation from an Air Traffic Management Regulation.	Regulations and/or procedures not fully complied with
	• Manning and Equipment			
3	Organisational	• ATM Staffing and Scheduling	An event related to the planning and scheduling of ATM personnel	

4	Technical	• Radar Coverage	Radar Coverage	Non-functional or unavailable
	• Situational Awareness and Action			
5	Human Factors	• ANS Traffic Information Provision	Provision of ANS traffic information	TI not provided, inaccurate, inadequate, or late
6	Human Factors	• Expectation/Assumption	Events involving an individual or a crew/ team acting on the basis of expectation or assumptions of a situation that is different from the reality	Concerned by the proximity of the aircraft
7	Contextual	• Traffic Management Information Action	An event involving traffic management information actions	The ground element had only generic, late or no Situational Awareness
	Flight Elements			
	• Regulations, Processes, Procedures and Compliance			
8	Organisational	• Flight Operations Documentation and Publications	Flight Operations Documentation and Publications	Inadequate regulations or procedures
	• Tactical Planning and Execution			
9	Human Factors	• Accuracy of Communication	Events involving flight crew using inaccurate communication - wrong or incomplete information provided	Ineffective communication of intentions
10	Human Factors	• Insufficient Decision/Plan	Events involving flight crew not making a sufficiently detailed decision or plan to meet the needs of the situation	Inadequate plan adaption
11	Human Factors	• Pre-flight briefing and flight preparation	An event involving incorrect, poor or insufficient pre-flight briefing	
	• Situational Awareness of the Conflicting Aircraft and Action			
12	Contextual	• Situational Awareness and Sensory Events	Events involving a flight crew's awareness and perception of situations	Pilot had no, late or only generic, Situational Awareness
13	Human Factors	• Understanding/Comprehension	Events involving flight crew that did not understand or comprehend a situation or instruction	Pilot did not assimilate conflict information
	• Electronic Warning System Operation and Compliance			
14	Contextual	• Other warning system operation	An event involving a genuine warning from an airborne system other than TCAS.	
	• See and Avoid			
15	Human Factors	• Lack of Individual Risk Perception	Events involving flight crew not fully appreciating the risk of a particular course of action	Pilot flew close enough to cause concern
16	Human Factors	• Monitoring of Other Aircraft	Events involving flight crew not fully monitoring another aircraft	Non-sighting or effectively a non-sighting by one or both pilots

Degree of Risk: C.

Recommendation: Nil.

Safety Barrier Assessment[6]

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

Ground Elements:

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

Regulations, Processes, Procedures and Compliance were assessed as **ineffective** because 1. the FOB allowed circuit join at a number of heights without conformation to a controller, 2. the aircraft were allowed to be on different VHF frequencies and 3. the controller didn't establish the R44 pilot's routeing.

Manning and Equipment were assessed as **partially effective** because the Scampton controller did not have access to or information from a surveillance display, that would have been provided had Waddington had sufficient manning to be open.

Situational Awareness of the Confliction and Action were assessed as **partially effective** because the Scampton controller only had generic SA and made an ambiguous radio call ('transiting out to the west') which was interpreted by the RAFAT member as the R44 transiting *to* the west, i.e. westbound, and passed on as such to RAFAT leader.

Flight Elements:

Regulations, Processes, Procedures and Compliance were assessed as **ineffective** because the FOB allowed circuit join at a number of heights without conformation to a controller.

Tactical Planning and Execution were assessed as **partially effective** because 1. RAFAT did not convey their intention to conduct a VRIAB from 300ft, 2. RAFAT descended from 1000ft due to incorrect SA on the R44 position and course and 3. RAFAT believed R313 was active when it was not, resulting in a false sense of sanctuary.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because RAFAT had incorrect SA on the R44 position and course and the RAFAT member did not assimilate that the controller was asking for circuit join at 1000ft.

See and Avoid were assessed as **partially effective** because the R44 pilot saw RAFAT at sufficient range that they were able to maintain a degree of separation that was acceptable to them, albeit with a high closing speed.