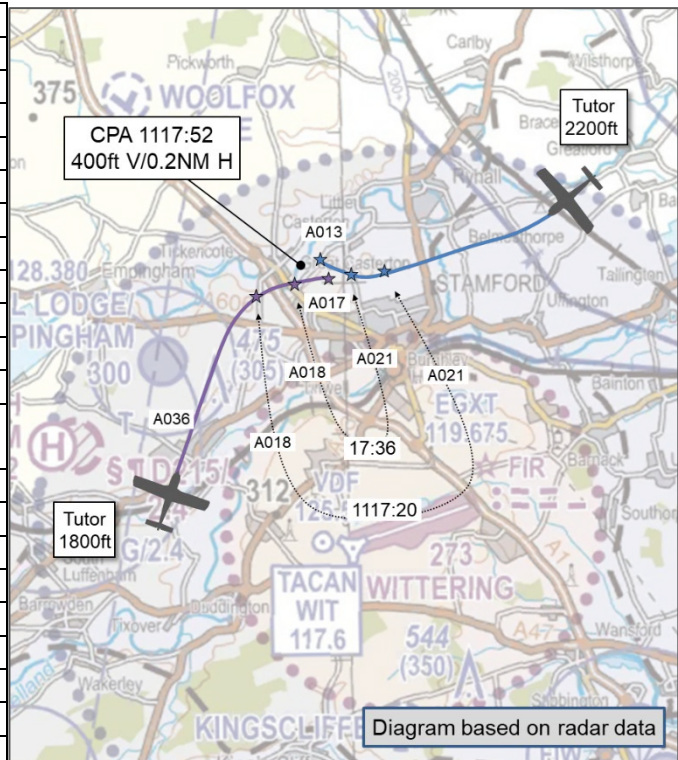


AIRPROX REPORT No 2021003

Date: 13 Jan 2021 Time: 1117Z Position: 5240N 00030W Location: IVO Stamford

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Tutor(A)	Tutor(B)
Operator	HQ Air (Trg)	HQ Air (Trg)
Airspace	Wittering MATZ	Wittering MATZ
Class	G	G
Rules	IFR	IFR
Service	Deconfliction	Deconfliction
Provider	Wittering	Wittering
Altitude/FL	1300ft	1700ft
Transponder	A, C, S	A, C, S
Reported		
Colours	White	White
Lighting	Nav, HISL, Landing	Nav, HISL
Conditions	IMC	IMC
Visibility	0km	1km
Altitude/FL	2000ft	1500ft
Altimeter	QFE (1007hPa)	QFE (1007hPa)
Heading	255°	070°
Speed	100kt	100kt
ACAS/TAS	TAS	TAS
Alert	TA	TA
Separation		
Reported	100-150ftV/3-400m H	0ft V/0.3NM H
Recorded	400ft V/0.2NM H	



THE TUTOR(A) PILOT reports that they had just aborted a PFL 1 instructional sortie due to weather (insufficient cloud base) and commenced a VFR recovery to Wittering from the NE where the cloudbase was ~2000ft, descending to the west with an approaching warm front. The student was flying the aircraft, completed the checks, called for a visual recovery and began a descent heading towards Market Deeping and initials, at which point ATC informed them that the circuit was full and that they should hold off. The instructor told the student to hold to the NE of Stamford, and the student subsequently relayed these intentions to air traffic. As they approached Stamford at ~1300ft QFE, heading 255°, the controller asked them to climb to 2000ft QFE for deconfliction. The instructor informed air traffic that this would put them IMC but the instruction was re-iterated, the student instigated a climb straight ahead and once established the instructor took control (given that the student was unrated and they would shortly enter cloud) and requested a Deconfliction Service. This request was accepted by the controller and then acknowledged by the instructor; so they believed a Deconfliction Service contract existed between them and the controller. The aircraft went into the base of the cloud layer at ~1900ft, although vertically downwards they were still in sight of the surface. As they levelled off the aircraft at 2000ft QFE and accelerated to 100kts the student called TAS and concurrently they received an audio Traffic Advisory. On scanning cross cockpit to the EHSI/TAS they saw a solid yellow circle (TA) contact in the 12 o'clock well inside the 2NM range ring with a 03 underneath the circle indicating 300ft separation (noting the TAS fitted to the Tutor has a published +/- 200ft error). This TA was followed immediately by a collision tone from the FLARM (19-25 secs to collision), rapidly increasing in frequency (14-19 secs and then 6-8 secs to collision) and they therefore commenced immediate avoiding action believing there to be a very high risk of collision with an unknown aircraft inside the Deconfliction Service separation bubble. They rolled right to ~45° AOB while lowering the nose (knowing that they were in the base of the cloud, in sight of surface and would gain full visual refs almost immediately), they transmitted something along the lines of "traffic alert, descending" while increasing to 60° AOB as they gained sufficient visual references and increased the G to turn towards the north and increase

separation. They were immediately visual with another Tutor in the 10 o'clock, range 3-400m and 100-150ft above. They were now on a divergent track so rolled wings level and then turned on to a parallel track, content that they now had separation and the other aircraft wagged its wings in acknowledgment while the instructor declared an Airprox to air traffic. There was no call from the other aircraft on frequency (the other pilot was operating on WIT App #4 whilst they were on WIT Zone #3). They assessed the risk of collision at the time as very high. Air Traffic then cleared them for a visual recovery which they conducted through initials as the cloud base remained marginal for an 1800ft overhead join. The aircraft recovered without further issue.

On the ground both crews debriefed. It is worthy of note that the other aircraft captain then attempted to raise ATC by phone - due to changes in the telephone infrastructure at WIT they were unable to raise any of the ATC numbers and in the end had to contact the DSS and ask them to floor walk to find someone. Neither Supervisor or Dep Supervisor were present but eventually the controller was located and a debrief conducted.

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

THE TUTOR(B) PILOT reports that they were flying a Flying Training Refresher Sortie (IF1) for a pre-Phase 4 student. They had just completed a touch-and-go from a radar PAR and were being vectored downwind in the RTC for a further PAR. Having levelled at 1500ft (IMC) and heading 030° they observed a TAS contact in approximately the right 2 o'clock position indicating 300ft above at around 1.5-2NM. Approximately 5sec later ATC (WITT APP #4) instructed them to turn right heading 070°. This took them almost directly towards the TAS contact. At the same time they were slowly exiting solid IMC and were intermittently visual with the ground with light rain and mixed stratus layers in a constantly improving weather picture. The instructor voiced to the student that the TAS contact was becoming an issue and that they may have to descend. They had been given no Traffic Information from ATC and the instructor instinctively took control and began to initiate a descent against the contact indicating 300ft above. The TAS and FLARM audio were both transmitting. At the same time, they transmitted that they were descending and became visual with the TAS contact [Tutor(A)] who was clearly also attempting to take avoiding action. Given the visibility in rain it was difficult to assess the range between the two aircraft. They estimated that they passed through the same level within 0.3NM. They then told ATC that they had taken avoiding action on a TAS contact. The remainder of the sortie was continued as normal. On return to the Sqn, it was very difficult to get hold of anybody in the tower to discuss the issue, due to the lack of telephones and COVID restrictions. The DSS volunteered to walk to the building on their behalf and try and track down the controller. It subsequently transpired that 1 controller was working #3, #4 and VHF Zone with numerous (around 5) contacts IMC. The only SA the pilot had on the contact came from TAS.

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

THE WITTERING APPROACH CONTROLLER reports that they had just taken over the approach position with 4-5 aircraft on 2 different frequencies. Around 3-4 of those were under a Deconfliction Service due to poor weather conditions and the RTC was active with aircraft requiring a radar recovery due to the weather. Upon taking over, they had 2 Tutors north of WIT under vectors under a Deconfliction Service for navigation flying and 1 aircraft turning north in the RTC at 1500ft QFE also under a Deconfliction Service. Shortly after taking over the control position Tutor(A) called for visual recovery approximately 4-5NM south of Bourne. The visual circuit was full at the time and the pilot was informed of this and instructed to hold off the approach. The pilot transmitted that they would like to hold north of Stamford. The aircraft was indicating 017 on Mode C which was the same height as Tutor(B). This would then put it in direct confliction with Tutor(B), who was under a Deconfliction Service. The controller quickly instructed Tutor(A) to climb to 2000ft QFE 1007, which was read back. In addition, the pilot stated that this would put them into IMC and would need an upgrade to Deconfliction Service. With Tutor(B) quickly approaching and a further 2 aircraft north of WIT also under a Deconfliction Service the controller informed Tutor(A) that they had another aircraft in the RTC under a Deconfliction Service that they would be coordinated against. To their best knowledge the pilot started to climb and acknowledged to hold at 2000ft. The controller then subconsciously did not call Tutor(B) to Tutor(A) as they decided they were safely vertically separated, and another aircraft to the north was coming into

potential conflict with a Cranwell aircraft. They then called this traffic to the aircraft north of the airfield and gave deconfliction advice to turn onto 180°. Following this, the controller heard transmissions being made by Tutor(A) and the term Airprox being used. They observed Tutor(A)'s Mode C which now indicated 017-016, which was not the 2000ft holding height that was instructed. They did not recall if Tutor(A) pilot had requested or informed them that they were descending or vacating 2000ft. The descent put both Tutor(A) and Tutor(B) in direct conflict with each other. The controller quickly acknowledged the Airprox and carried out the appropriate action. Tutor(B) continued the radar recovery without further occurrence and Tutor(A) was shortly allowed into the visual circuit without further occurrence. This was a busy period on console with the majority of pilots requiring a radar recovery or Deconfliction Service during the sortie, at the same time there were aircraft also conducting multiple approaches in the RTC. In hindsight, the controller noted they would have called Tutor(B) to Tutor(A) and vice versa, however at the time they felt that they were safe with vertical separation and that their attention was better suited elsewhere with the 2 aircraft north under a Deconfliction Service and multiple Cranwell aircraft coming into potential conflict.

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

THE WITTERING ATCO I/C reports that this was a particularly busy and complex period of controlling in IMC, although not outwith normal capacity for the Unit. Of note, the ATC support to flying comprised only of 3 controllers in the Radar Approach Room (no establishment for Supervisor), where 4 would be the normal number rostered. As the ATCO I/C, they handed over the Witt TC(RA) task 5-10mins before this incident. They maintained a listening watch for a short period following handover to ensure that all pertinent points had been understood and to lend support if required. Another controller was conducting the PAR task, who they relieved in order to allow that controller to cover the Witt TC(Zone) task and offer support to TC(RA). The ATCO I/C then engaged with the next PAR, following which they were advised of the Airprox. They instructed the TC(Zone) controller to take over the PAR task and then relieved TC(RA) controller, taking over the task. Although their intent was for this controller to commence the administrative work for the Airprox, due to the Unit work loading, they were subsequently required to offer further support and to eventually take up the PAR2 position. The Unit DSS was advised of all details and, once the controller was away from the console, both pilots were contacted. Engineers were contacted to impound all relevant tapes and a tape transcript was requested and a DASOR instigated. The ATCO I/C concurred with the details of the controller's narrative, though added that both aircraft were on separate frequencies, thus impacting their level of SA.

Factual Background

The weather at Wittering was recorded as follows:

METAR EGXT 131050Z 27007KT 4000 -RA FEW018 BKN020 BKN070 03/02 Q1017 RMK GRN=

Analysis and Investigation

Military ATM

The Wittering Approach controller was bandboxing the Approach and Zone tasking and was controlling 4-5 aircraft across two frequencies, with 3-4 of those under a Deconfliction Service in poor weather conditions. They reported that Tutor(A) requested a visual recovery however, as the visual circuit was full the pilot was instructed to hold off their approach. As Tutor(A) was indicating the same level as Tutor(B), Tutor(A) was instructed to climb to 2000ft because Tutor(B) was under a Deconfliction Service and required separation. The climb was acknowledged and Tutor(A) was upgraded to a Deconfliction Service when requested. However, specific Traffic Information was not passed to Tutor(A) about Tutor(B). Traffic Information was passed to Tutor(B) about Tutor(A) however, this was not acknowledged by the pilot. Once the instruction to climb was passed the controller turned their attention to another aircraft under their control which was coming into conflict because the controller believed vertical separation existed between Tutor(A) and Tutor(B). The controller became aware of the reduction in separation following the transmission from Tutor(A).

Figures 1-6 show the positions of the Tutors at relevant times in the lead up to and during the Airprox. The screen shots are taken from a replay using the NATS Radars, which are not utilised by Wittering, therefore, may not be entirely representative of the picture available to the Wittering controller.

Tutor(A) was holding to the NE of the airfield following notification that the visual circuit was full. Tutor(A) was instructed to climb and report level at 2000ft, the pilot advised that a climb to 2000ft would put them in IMC. The controller advised them that the climb would coordinate them against traffic (Tutor(B)) in the RTC. Separation was 7.6NM and 200ft (Figure 1).

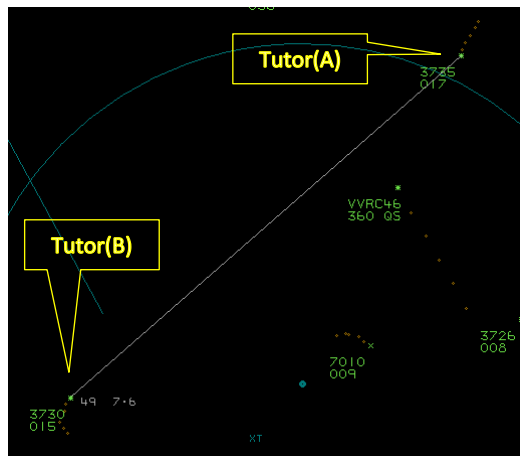


Figure 1: Tutor(A) instructed to climb to 2000ft.

Tutor(A) pilot requested, and was given a Deconfliction Service, and the controller reiterated the climb to 2000ft instruction. Separation decreased to 4.2NM and 200ft (Figure 2).

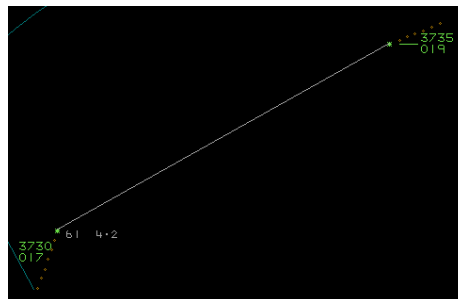


Figure 2: DS provided and the climb instruction to 2000ft reiterated.

Eleven seconds later Traffic Information was passed to Tutor(B) on Tutor(A) however, it was not acknowledged by the pilot. Separation was measured at 3.8NM and 300ft (Figure 3).

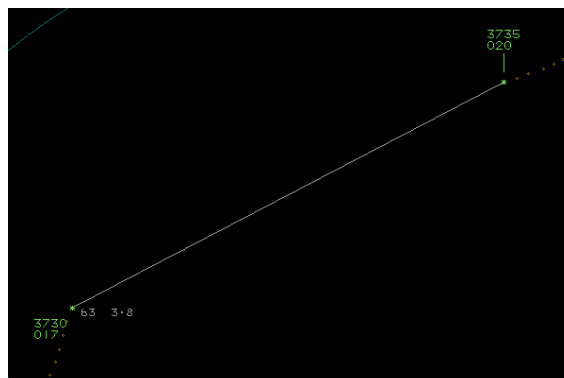


Figure 3: Traffic Information passed to Tutor(B).

Twenty-one seconds later Tutor(B) was instructed to turn right onto 070° (Figure 4) which was passed again by the controller fifteen seconds later (Figure 5) as there was no visual confirmation of the turn. Tutor(A) had reached their assigned level although Tutor(B) Mode C now indicated they climbed 100ft. Separation was measured at 2.2NM and 400ft (Figure 5).

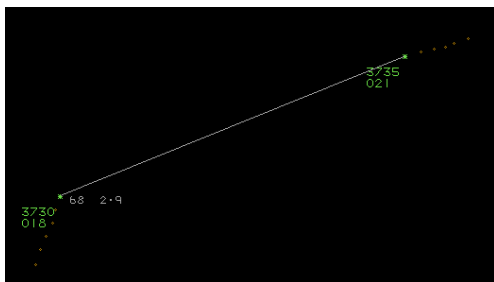


Figure 4:
Tutor(B) turned onto 070°.

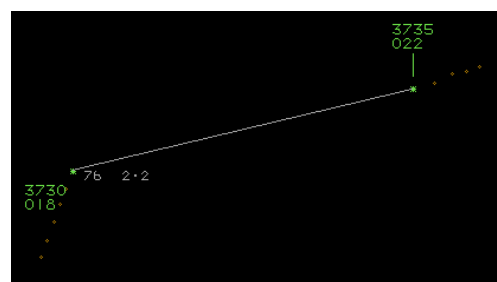


Figure 5:
Tutor(B) confirmed turn to 070°.

Twenty-one seconds later both Tutors reported descending for traffic. Separation decreased to 1.2NM and 300ft. CPA was measured at 0.4NM and 100ft.

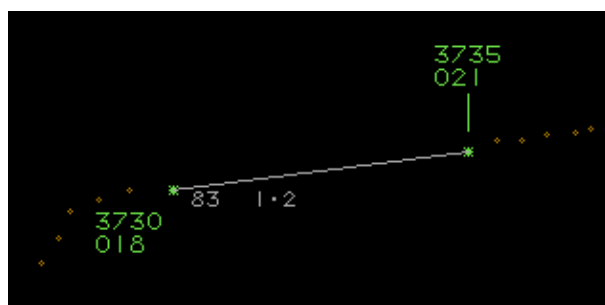


Figure 6:
Both Tutor pilots report descending for traffic.

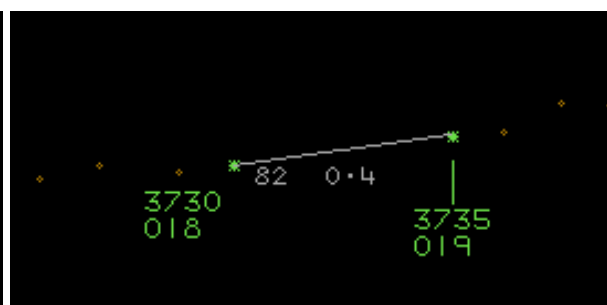


Figure 7 :CPA

Poor weather across the controller's area of responsibility resulted in a number of pilots requiring a Deconfliction Service which increased the controller's workload during a busy period with up to 5 aircraft across two frequencies. The RT transcript showed that RT loading and landline communication was high in the lead up to, and during, the Airprox. It also showed that Traffic Information was passed to Tutor(B) although this was not acknowledged by the pilot therefore, it is likely that it was not heard as it was reported that no Traffic Information had been passed. Information was passed to Tutor(A) however; the Traffic Information did not provide a position report on Tutor(B). The controller provided instruction to Tutor(A) to ensure the deconfliction minima of 500ft could be achieved and requested the pilot to report level at 2000ft. Further Traffic Information was not passed to either pilot as the controller believed they were safely separated by 500ft and was providing instruction to another aircraft.

Although the pilot climbed as requested, they did not report level however, there was sufficient radar sweeps to confirm level occupancy. The radar replay showed some deviations of +/- 100ft from the given level by both Tutor pilots which reduced the separation below the required deconfliction minima and which was not identified by the controller. It is unclear as to why Tutor(B) pilot took the turn to 070° despite recognising that the turn would put them into conflict with the TAS contact without requesting information from the controller. The decision by Tutor(A) pilot to descend in response to the TAS alert decreased the vertical separation further prior to CPA.

An Occurrence Safety Investigation was conducted which highlighted that the ATC manning was reduced to three controllers due to a short notice request for leave and that the Approach/Zone controller was too busy to handover the Zone task to another controller. The ATCO I/C who had recently handed over the Approach/Zone position was on position in the talkdown role and was advised of the Airprox after the event.

UKAB Secretariat

At approximately 1117:42 on the Swanwick 'all systems' radar selection the two Tutors were separated laterally by 0.4NM and 100ft, giving a slant range of around 2400ft (Figure 7 above). At 1117:44 on the Claxby single source radar selection, Tutor(A) had turned and descended to 1400ft (Figure 8) and by 1117:52 the separation had reduced to 0.2NM and 400ft, an approximate slant range of 1265ft, making this actual CPA, although by this stage Tutor(A) had descended below and was heading away from Tutor(B) (Figure 9).

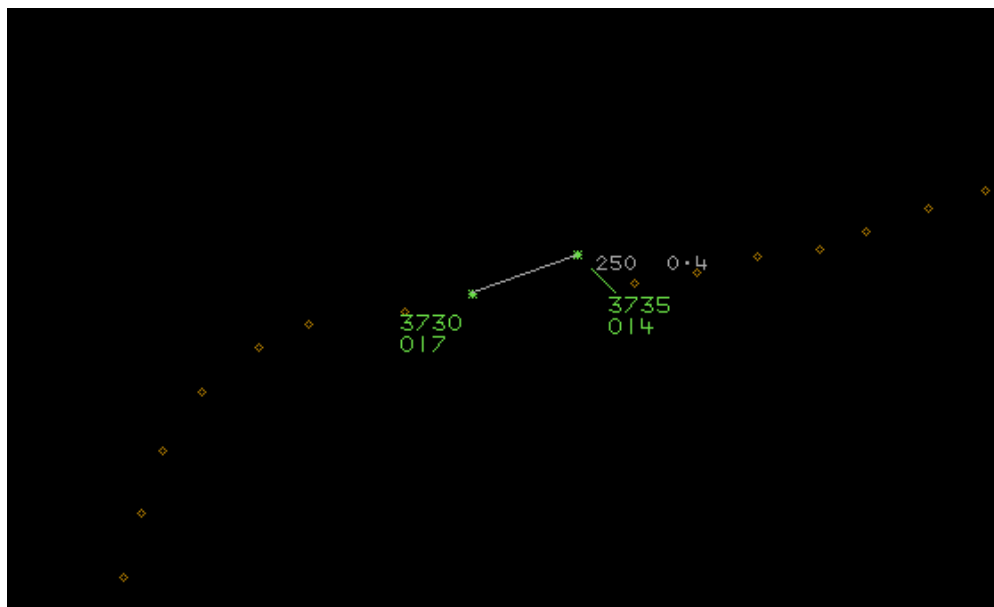


Figure 8: 1117:44 Claxby radar



Figure 9: 1117:52 CPA

The Tutor(A) and Tutor(B) 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

¹ MAA RA 2307 paragraphs 1 and 2.

² MAA RA 2307 paragraph 13.

Occurrence Investigation

Parts of the RAF Wittering Occurrence Investigation are reproduced below:

As part of planning to address concerns regarding the sustainability of ATC radar provision at RAF Wittering during the COVID pandemic, measures were introduced to split the normal one shift manning model into two. In this regard, the Visual Control Room organisation, which is delivered via civilian contract adopted a model that reduced the rate of flying from RAF Wittering. Similarly, the manning for the Radar Control Room – delivered by the RAF – was split such that daily shifts were planned to have a minimum of 4 controllers aided by one assistant. The division of skillsets focused on spreading experience while also attempting to maintain a training program. The driving force behind the split was to ensure that if COVID struck one shift the other could maintain support to operations. There has never been provision in terms of manning or equipment for an ATC Supervisor. The model was approved by the Stn Cdr following the submission of a Risk Owners Advice Note (ROAN). A subsequent review of the manning model noted that any manning deviation below 4 controllers and in accordance with ATC Section Order Book (SOB) should be notified via the normal command chain which included SATCO, OC Ops Wg and the Flying Operators. In recognition of the likely demands facing 3 controllers, it was agreed that the daily service levels from ATC RAF Wittering would be reduced.

On the day of the incident, poor weather in the morning delayed flying and there was an expectation that due to the movement of a warm front from the west, flying in the afternoon would also be curtailed. However, this could not be confirmed until on the day. Manning for the day had been reduced by [the ATCO I/C] (in response to a short notice request for a day's leave) to 3 controllers without seeking executive approval such that the controlling shift comprised 2 fully endorsed personnel (Zone/Approach/Talkdown) and one (Trainee) with 2 endorsements (Zone and Talkdown).

Some 15 minutes prior to the incident, ATC 1 [the Airprox controller] assumed responsibility for Zone and Approach from ATC 2 [the ATCO IC] – this was achieved by managing separate frequencies and is known as 'Bandboxing'. In addition, the controller responsibilities include monitoring the local VHF frequency for LARS requests. 'Bandboxing' during demanding periods requires special attention so that the controller responds to a call for service on the correct frequency. Shortly after the Zone/ATC controller switch, ATC 2 relieved ATC 3 (Trainee controller) from the Talkdown seat with the intent that the Trainee should support ATC 1 by assuming responsibility for Zone. However, the Zone/Approach controller was particularly busy providing a Deconfliction Service to 4/5 speaking units across both frequencies such that it was not possible to effect a Zone handover.

The investigation recommended that the DDH should direct staffs to reconsider the ATC staffing model currently in use at RAF Wittering and implement procedures to limit risks such as shortfalls and task saturation.

While providing a Deconfliction Service to the Tutor aircraft in proximity and listening on different frequencies, information calls that would have ensured proper situational awareness for aircraft operating under reduced separation margins were not made. Approach frequencies was beyond the capacity of ATC 1. A routine test found that other ATCOs confirmed the complexity of providing a Deconfliction Service to meet the disparate requirements of different Tutor aircraft operators on more than one frequency.

The investigation recommended that the lack of awareness of definitive guidance regarding different levels of ATC Service provision and ATCO workload/bandboxing should be raised immediately with Air Command ATC specialists.

The 2 aircrew of [Tutor(A)] were on the 20th sortie of the Elementary Flying Training Course with training focused upon Practise Forced Landings and exploring all altitude aspects of this scenario which required a minimum cloud based of 3500ft. Due to the weather not all elements were

achievable and the crew elected to recover having completed part of the syllabus. As the student lacked any Instrument Rating experience and in line with a desire to maximise their aircraft handling time, the intent was to complete a visual recovery to RAF Wittering. The student's R/T call for a visual recovery was on the Approach frequency and slightly later than optimal but outside the MATZ at 6.5NM. As the circuit was full the crew were asked to hold and to climb to 2000ft which would put them IMC. The Captain questioned the climb due to concerns regarding both the weather and the risk of conflict with other traffic in the Radar Training Circuit (RTC). However, [the App controller] referred to other RTC traffic at 1500ft without providing detailed Traffic Information. Ahead of entering cloud, [Tutor(A) pilot] assumed control of the aircraft. Shortly before commencing the climb, the crew were aware of TAS contacts 5 miles to their west but as the aircraft levelled at 2000ft the student drew attention to the TAS display. This was followed almost immediately by an audio collision warning from the same system. Shortly after, [Tutor(A) pilot] reported hearing proximity and then collision warnings from the FLARM audio – a sound that they had only heard once before and something never encountered even while sharing a congested airfield circuit with similarly equipped aircraft. Although technically in IMC and blind to any aircraft, [Tutor(A) pilot] had sight of the ground and made an instinctive reaction to take avoiding action based upon TAS warnings of a threat that was zero bearing, possibly co-altitude and reducing range. The avoiding manoeuvre involved a roll to 45° AOB designed to achieve lateral separation and lowering of the aircraft nose to achieve VMC conditions followed by an increase of bank and a turn of 90 to 100°. While exiting the cloud, [Tutor(A) pilot] visually acquired the other Tutor aircraft (at 1500ft) some 200ft above having levelled the aircraft at an altitude of approximately 1300ft. Other than relying on visual impressions, it was not possible to determine the precise proximity of the 2 aircraft other than to confirm that they were IMC, unsighted and below safe separation minima.

Meanwhile the aircrew of [Tutor(B)] were on a flying training refresher sortie. Their sortie focus was on instrument flying and following the completion of a PAR into the Radar Circuit the crew were directed by the Talkdown controller to fly at 1500ft QFE rather than the normal pattern height of 2000ft. Upon entering cloud, the student pilot requested a Deconfliction Service while the instructor debriefed the first approach highlighting the importance of challenging ATCOs if Traffic Information did not make sense. The crew were aware of a TAS contact showing at the 3 o'clock position. Subsequently, radar vectors onto a heading of 070° pointed the aircraft directly toward the TAS contact showing 300ft above. At this point, the crew were technically flying in IMC with occasional glimpses of both the ground and the horizon and they could not explain why they did not make a call to ATC for information. Instead and becoming increasingly concerned by the proximity of the TAS contact, [Tutor(B) pilot] assumed control of the aircraft and although not visual, they initiated a descent. Shortly afterwards, the crew gained visual contact with the other Tutor which appeared to be descending and they recovered to level flight.

The investigation recommended that the DDH should direct staffs to request an immediate amendment of the Tutor Training Manual to include advice to aircrew regarding both internal confirmation of TAS contacts and, where applicable, the use of ATC to help address any potential conflicts/concerns.

The Tutor aircraft operated by both 3 & 6 FTS are fitted with two collision warning systems: The Traffic Advisory System (TAS) and Power FLARM. Regulations and advice regarding the use of the systems such as Standard Operating Procedures are spread across both sets of FTS orders and the Tutor document set. During interviews with four Tutor aircrew, it was clear that while there was a common general appreciation that TAS was an aid to look out in Visual Meteorological Conditions, there was less common understanding regarding its safety criticality and accuracy. While most aircrew were familiar with the system altitude errors (+/- 170 ft) and range accuracy, there was less agreement regarding reliance on 'Angle Off' information. Equally, interviews with Tutor aircrew and supervisors did not identify common agreement on where regulations and advice for TAS use could be found. In the case of FLARM, aircrew operating in the vicinity of RAF's Cranwell and Wittering rarely experience either audio or visual warnings except when either waiting for take-off or operating in the airfield circuit. As with TAS, interviews with Tutor aircrew confirmed that FLARM was recognised as an aid to seeing and avoiding glider/FLARM equipped traffic in VMC conditions. Knowledge regarding access to operating procedures and user advice for FLARM was

less conclusive. A substitution test found that there was also common agreement that the rapid onset of the warnings that denied the opportunity for an RT check, left a pilot on the edge of IMC feeling compelled to take avoiding action. Of note, the pilot of Tutor(B) also initiated avoiding action while IMC.

The investigation recommended that as soon as practicable, the DDH should direct staffs to seek an update to the advice to aircrew about the inadvisability of manoeuvring in IMC based solely on TAS/FLARM indications.

Comments

HQ Air Command

This Airprox was subject to a thorough Occurrence Safety Investigation, which detailed several Causal Factors and made 5 recommendations. As a result, RAF Wittering have done away with the 'split shifts' that were in use at the time, due to COVID; this ensures that supervision and ATCOs are spread, in turn ensures experience is shared. Additionally, the extant orders in the ATC Standing Order Book (wrt ATCO levels) have been re-iterated to ensure that minimum levels are maintained. A daily face to face brief with key players and supervisors is also taking place to discuss the flying program, met conditions, visiting aircraft and any other business of the day that could affect operational flying output. Two further recommendations look to provide crews with more guidance and update documents, with particular reference to IMC guidance for TAS and FLARM. The final recommendation looks to address the lack of awareness of definitive guidance regarding different levels of ATC Service provision and ATCO workload/bandboxing, which has been a theme with Airprox over the past year.

Using the 'Swiss Cheese' model to help picture how this Airprox happened; on this particular day, the holes aligned leading to a very near miss. The preconditions: the weather was poor, manning levels had been reduced last minute without any effect on the flying programme for that day. Person: the workload experienced by the controller was extremely high with 4 aircraft on different frequencies requiring a Deconfliction Service. The pilots hadn't received Traffic Information to the expected level afforded under a Deconfliction Service. Organisation: COVID restrictions have led to controllers being routinely bandboxed, thus increasing their workload exponentially during busy periods. The lack of a supervisor to assess the bigger picture also played a part. Hardware: the education to crews on the functionality of TAS/FLARM when IMC was not as well understood and as a result had the pilots, understandably, react to the uncertainty of the indications and therefore, into further conflict.

The investigation is to be commended for the level of detail, scrutiny and the recommendations, all of which will help to bolster barriers and help prevent a reoccurrence of this type from happening again. The DDH makes comment: 'The Aviation Duty Holders have tasked their Tutor Air Safety Teams to look again at the risk analysis to see if this second order consequence runs deeper and to determine whether there are additional actions they can take to reduce the likelihood of a recurrence – or worse. The OEM warnings with regards to this equipment are clear and this occurrence aptly demonstrates that there are some scenarios where the alerts it provides are counter-productive; this needs further analysis prior to any modification in current direction and guidance for its use'.

Summary

An Airprox was reported when Tutor(A) and Tutor(B) flew into proximity in the vicinity of Stamford at 1117Z on Wednesday 13th January 2021. Both pilots were operating under IFR in IMC and both were receipt of a Deconfliction Service from Wittering App.

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.

Due to the exceptional circumstances presented by the coronavirus pandemic, this incident was assessed as part of a 'virtual' UK Airprox Board meeting where members provided a combination of written contributions and dial-in/VTC comments.

The Board first looked at the actions of the Wittering Approach controller. Members thought that they were placed in a difficult position given that they were bandboxing the Approach and Zone positions and were providing a Deconfliction Service to so many aircraft. When Tutor(A) pilot called for recovery, with the visual circuit full, the aircraft needed to hold off. The controller recognised that the pilot's request to hold over Stamford would conflict with Tutor(B) in the radar pattern and so asked Tutor(A) pilot to climb to 2000ft and duly provided the Deconfliction Service requested. Although the controller had initially told the pilot about the traffic in the RTC circuit, they did not provide specific Traffic Information on Tutor(B). Having separated the two aircraft, and satisfied that they were safe, the controller did not provide further Traffic Information because they prioritised their other aircraft. Members thought that notwithstanding CAP774 which states that a controller will provide Traffic Information on deconflicted traffic subject to workload, still a Traffic Information call to both pilots probably would have satisfied the pilots that they were safe and prevented them taking their subsequent actions (**CF4**). Furthermore, as the frequencies were not 'cross-coupled' (which would have allowed pilots on different frequencies to hear each other), the pilots were unable to build situational awareness³. Once the controller had turned their attention to the other aircraft, they did not see that the Tutors were descending (**CF5, CF7, CF8**), and therefore could not provide resolution advice (**CF6**). The Board then discussed at length whether tasking was such that the controller had been overloaded; controlling members pointed out that 'controller overload' had a very specific meaning and only the controller concerned could say whether or not that was the case. Some members wondered whether military controllers reported an overload in the same way that civilian controllers did, and were assured by military colleagues that controllers could, and did, report using a DASOR. Given the concerns, in this particular case the Board agreed that high workload probably better described the situation and agreed that this was a contributory factor (**CF17**).

When looking at the reasons behind the controller's high workload, members agreed that the bandboxing of the ATC positions was a key factor, and that this was in part due to the reduced manning on the day. Military members noted that the procedure for reducing the manning included obtaining specific approval so that the flying programme could be adjusted accordingly. Unfortunately, this procedure was not adhered to on this occasion (**CF1, CF3**). Furthermore, controlling members thought that without an active supervisor overseeing the controller, there were fewer opportunities for the ATCO I/C to see the developing situation and split the task at the optimal moment (**CF2**). Indeed, by the time the ATCO I/C had re-organised the personnel to enable the task to be split, the Approach controller was too busy to effect a hand over. A lengthy discussion followed about the manning and establishment at RAF Wittering, which some members felt wasn't in line with the task. Whilst heartened to hear that the Unit Investigation had recommended a review of the manning, they wondered whether a recommendation from the UKAB would add further weight. However, they were told that a branch and trade review by the HQ had been completed very recently (Jan 21) and that also the MAA were about to conduct a review into controller manning and SQEP⁴. Furthermore, Wittering had engaged with the HQ to look at bandboxing and supervision, but military members noted that in the near future the task for Wittering radar would move to RAF Marham anyway. Members therefore decided that a further recommendation was not necessary. There followed further discussion on the lack of LARS provision in the area since the closure of RAF Cottesmore. The lack of LARS meant that the Tutors remained on the Approach controller's frequency; although it was noted that, had a Zone controller been in position, the Approach controller's workload would have been halved. However, some members thought that the gaps that were now apparent in the LARS provision pushed further work onto surrounding controllers and left pilots with no one to provide a radar service. A CAA advisor told the Board that the Future

³ It is thought that 'cross-coupling' is not possible at Wittering.

⁴ Suitably Qualified and Experienced Personnel

Airspace team in CAA SARG were due to conduct a review of Flight Information Service provision in the UK and so again members decided a recommendation was not necessary.

Turning to the actions of Tutor(A) pilot. They had called ATC for a visual recovery and were told to hold-off because the visual circuit was full. They chose to hold at Stamford and, because that would put them in conflict with Tutor(B) in the RTC, the controller instructed the pilot to climb to 2000ft, which they did. Some members wondered why the pilot hadn't asked to descend to remain VMC, as unfortunately, the climb meant they became IMC, although they were visual with the ground below. Whilst holding at 2000ft the pilot received alerts from both their TAS and the FLARM (**CF13**) informing them about the approaching traffic. Given that they were IMC, and could not see the other aircraft (**CF15, CF16**) the pilot became concerned and decided to take action by descending. Members wondered why the pilot hadn't questioned the controller about the traffic prior to taking the avoiding action, given that they were on a Deconfliction Service and therefore could have expected the controller to provide separation from other traffic (**CF11**). Although members were sympathetic to the reasons why the pilot descended, with both the TAS and the FLARM alerting, it was understandable that they wanted to become VMC to see the conflict, nevertheless in doing so they had deviated from their ATC clearance which was providing the separation (**CF9, CF10**). Members noted that the procedures for reacting to the on-board systems were optimised for VMC flight, with both TAS and FLARM developed to allow pilots to become visual with the conflicting traffic, unlike TCAS II which provides deconfliction advice, and they noted the Unit's recommendation to update the procedures for IMC flight. However, the avoiding action was not necessary on this occasion (because the controller had built in the separation). Furthermore, members thought that the avoiding action, with a descending 45° AOB whilst IMC, increasing to 60° as they gained sufficient visual references, could have put the aircraft in a UP and therefore had the potential to create a situation even more dangerous than that which the pilot had perceived (**CF12, CF14**).

The Tutor(B) pilot was in the RTC at 1500ft and also receiving a Deconfliction Service from the Approach controller. It was unfortunate that the early Traffic Information given by the controller was not acknowledged and members thought that the pilot had probably not heard it. However, given that the pilot saw the other Tutor on their TAS at range (**CF13**), but believed they had not received any Traffic Information, members wondered why they chose to take the turn onto a downwind heading and not question the controller about it (**CF11**). As they closed towards Tutor(A) the instructor became increasingly concerned, because they were IMC and could not see the conflicting aircraft (**CF15, CF16**) but still did not question the controller, until they too took avoiding action by descending (**CF12**). Some members opined that the permitted reduced separation of 500ft between RAF aircraft set the conditions for the Airprox, because if one aircraft was slightly above or below the cleared height, but still within accepted tolerances of level occupancy, as was the case with Tutor(B), it would alert the TAS, even though separation had been applied.

Finally, in determining the risk, members discussed the actions of both pilots and that of the controller. They thought that although the separation at CPA could be deemed to be adequate, the circumstances which led to the final geometry of the two aircraft, including high workload preventing the controller noticing the descent of the aircraft, that both pilots were IMC and both descended, and that Tutor(A) descended through the level of Tutor(B), all made for a situation where providence had a major part to play and they agreed that a risk of collision had existed. They accordingly assessed the Airprox as Risk Category A (**CF18**).

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2021003			
CF	Factor	Description	ECCAIRS Amplification	UKAB Amplification
	Ground Elements			
	• Regulations, Processes, Procedures and Compliance			
1	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			

2	Human Factors	• ATM Leadership and Supervision	An event related to the leadership and supervision of ATM activities.	
3	Organisational	• ATM Staffing and Scheduling	An event related to the planning and scheduling of ATM personnel	
• Situational Awareness and Action				
4	Human Factors	• ANS Traffic Information Provision	Provision of ANS traffic information	TI not provided, inaccurate, inadequate, or late
5	Human Factors	• Conflict Detection - Not Detected	An event involving Air Navigation Services conflict not being detected.	
6	Human Factors	• Conflict Resolution – Not provided	An event involving the non provision of conflict resolution	
7	Human Factors	• Task Monitoring	Events involving an individual or a crew/ team not appropriately monitoring their performance of a task	Controller engaged in other tasks
8	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				
9	Human Factors	• Flight Crew ATC Clearance Deviation	An event involving a deviation from an air traffic control clearance.	
• Tactical Planning and Execution				
10	Human Factors	• Action Performed Incorrectly	Events involving flight crew performing the selected action incorrectly	Incorrect or ineffective execution
• Situational Awareness of the Conflicting Aircraft and Action				
11	Human Factors	• Lack of Communication	Events involving flight crew that did not communicate enough - not enough communication	Pilot did not request additional information
12	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				
13	Contextual	• Other warning system operation	An event involving a genuine warning from an airborne system other than TCAS.	
14	Human Factors	• Response to Warning System	An event involving the incorrect response of flight crew following the operation of an aircraft warning system	CWS misinterpreted, not optimally actioned or CWS alert expected but none reported
• See and Avoid				
15	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
16	Contextual	• Visual Impairment	Events involving impairment due to an inability to see properly	One or both aircraft were obscured from the other
• Any other events				
17		• Any other event	Any other event not listed elsewhere within the event types list.	High controller workload contributed to the Airprox
• Outcome Events				
18	Contextual	• Near Airborne Collision with Aircraft	An event involving a near collision by an aircraft with an aircraft, balloon, dirigible or other piloted air vehicles	

Degree of Risk:

A.

Safety Barrier Assessment⁵

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

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

Ground Elements:

Regulations, Processes, Procedures and Compliance were assessed as **ineffective** because the ATCO I/C allowed the manning to drop below the minimum without following the procedures to inform the management chain.

Manning and Equipment were assessed as **ineffective** because the manning had been allowed to drop below the minimum without a corresponding change to the flying programme.

Situational Awareness of the Confliction and Action were assessed as **ineffective** because the controller was not aware that both Tutor pilots were descending to take avoiding action.

Flight Elements:

Regulations, Processes, Procedures and Compliance were assessed as **partially effective** because Tutor(A) pilot deviated from the ATC instruction to maintain 2000ft.

Tactical Planning and Execution was assessed as **partially effective** because Tutor(B) pilot did not query ATC when they gave an instruction to turn towards the TAS contact and Tutor(A) pilot deviated from the ATC instruction to maintain 2000ft.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **partially effective** because neither pilot requested more information from ATC even though both were concerned by their TAS indications and subsequently both pilots took action based upon the TAS/FLARM indications.

See and Avoid were assessed as **not used** because both pilots were in cloud and could not see the other aircraft.

Airprox Barrier Assessment: 2021003		Outside Controlled Airspace		Effectiveness				
Barrier		Provision	Application	Barrier Weighting				
				0%	5%	10%	15%	20%
Ground Element	Regulations, Processes, Procedures and Compliance	✓	✗	[Red bar: 0% to 5%]				
	Manning & Equipment	✗	✗	[Red 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	✓	⚠	[Yellow bar: 0% to 10%]				
	Tactical Planning and Execution	✓	⚠	[Yellow bar: 0% to 10%]				
	Situational Awareness of the Conflicting Aircraft & Action	✓	⚠	[Yellow bar: 0% to 17.5%]				
	Electronic Warning System Operation and Compliance	✓	✓	[Green bar: 0% to 15%]				
	See & Avoid	✗	○	[Red bar: 0% to 20%]				
Key:		Full	Partial	None	Not Present/Not Assessable	Not Used		
Provision	✓	⚠	✗	●	○			
Application	✓	⚠	✗	●	○			
Effectiveness	■	■	■	■	□			