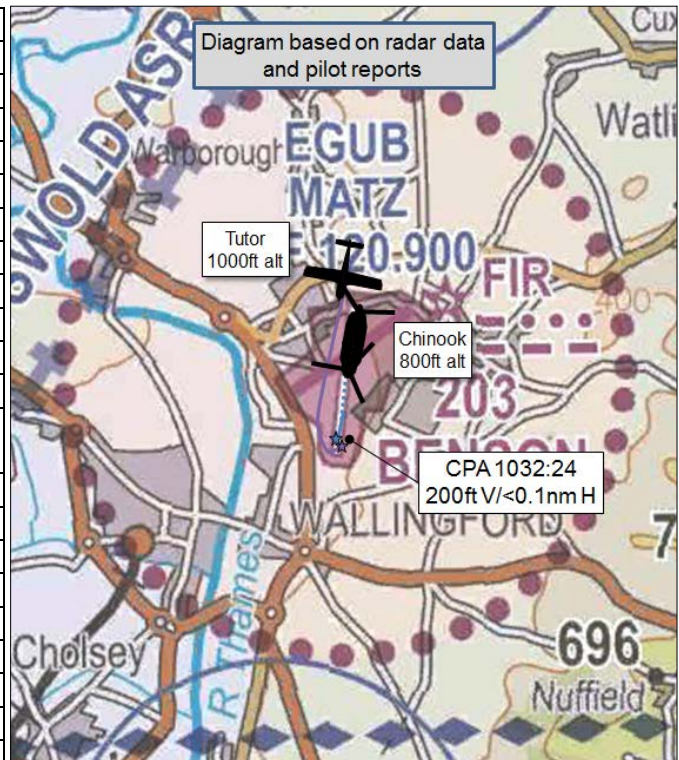


AIRPROX REPORT No 2016232

Date: 04 Nov 2016 Time: 1030Z Position: 5136N 00105W Location: Benson MATZ

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Chinook	Tutor
Operator	HQ JHC	HQ Air (Trg)
Airspace	Benson MATZ	Benson MATZ
Class	G	G
Rules	IFR	VFR
Service	Aerodrome	Aerodrome
Provider	Benson	Benson
Altitude/FL	800ft	1000ft
Transponder	On/S	On/C, S
Reported		
Colours	Green	White
Lighting	HISL	Strobe, Landing, Nav
Conditions	NK	VMC
Visibility	7km	8km
Altitude/FL	800ft	800ft
Altimeter	QFE (1003hPa)	QFE (1003hPa)
Heading	189°	190°
Speed	80kt	NK
ACAS/TAS	Not fitted	TAS
Alert	N/A	Unknown
Separation		
Reported	NK V/70m H	100ft
Recorded	200ft V/<0.1nm H	



THE CHINOOK PILOT reports that he was flying an IF GH training sortie. A crew change was conducted on the Eastern grass before calling ready to copy departure details on the Tower frequency. Once details had been obtained, the NHP called ready for taxi RW 19, ATC held them in position to deconflict with Tutor traffic. Upon obtaining clearance to line up, the aircraft was manoeuvred to RW 19 and the NHP called ready for departure once they were on the RW heading. A departure clearance was given, and the RHS HP was given control for an IF TO. The No2 crewman called visual with a Tutor on the deadside and called his 'padlock' [UKAB Note: padlock is a military codeword for maintaining visual contact]. The crewman continued to monitor the Tutor which was approximately 200m to the right of the Chinook at around 500ft. The RHS HP conducted an IF TO and the NHP called Tower to advise a change to the Approach frequency. Shortly after that, the No2 crewman called that the Tutor was converging, followed by calling avoiding action to descend. The LHS NHP became visual with the Tutor, which had turned across the front of the Chinook as the converging call was made. As the avoiding action was called, the LHS simultaneously called to take control and descended the Chinook immediately with a slight right turn. Immediately on avoiding the Tutor, the Chinook continued descent to around 300ft, and Approach were advised of the Airprox, and that the IF departure was being terminated. The LHS maintained control of the Chinook and advised that a join for downwind RW 19 would be required. They were subsequently transferred to the Tower frequency and the Chinook was recovered to normal circuit height once all traffic had been identified. An approach was made to RW 19 and the aircraft was taxied clear of the active onto the Eastern Grass. Had avoiding action not been taken, the Chinook captain believes that the aircraft would have collided. The sortie was immediately terminated due to the severity of the incident.

He assessed the risk of collision as 'High'.

THE TUTOR PILOT reports that he was flying solo in the circuit and was on his 5th circuit of the sortie. On this circuit he had requested a glide, and was aware of the Chinook on the eastern grass preparing for a SID. As he initiated his descent from 1500ft and called finals for RW 19 he was instructed to go around by ATC. Because he was at approximately 1300ft, he continued to descend to Tutor circuit height (800ft) and positioned to the deadside. As he did this he watched the Chinook hover taxi sideways onto the runway to line up for departure. On coming abeam with the threshold for RW 19 he called deadside. Shortly after this the Chinook pilot called airborne and to Approach, but at this point he had lost visual with the Chinook. He then focused his attention on regaining visual contact with the Chinook. Due to the Chinook being low and on his left-hand side (he was seated on the right-hand side), he had to dip his wing several times before regaining visual with it low in his 7 o'clock. At this point, he was comfortable to turn over the aircraft to rejoin the circuit. After establishing his level left hand turn, he watched the Chinook unexpectedly turn right towards him in his climb and go behind him. He assessed they passed within 150-200' of each other. He heard the subsequent radio call from the Chinook that he was unhappy with the position of the circuit traffic and the mention of an Airprox. After another 2 circuits he completed his sortie. On changing to ground frequency from the busy tower frequency, he passed his callsign and informed ATC of his intention to speak to the Chinook pilot to discuss the Airprox. His TAS was switched off during the sortie due to the busy circuit traffic, but he was comfortable with good SA on the other circuit traffic throughout.

He assessed the risk of collision as 'Low'.

THE BENSON CONTROLLER reports that she was instructing a UT ADC controller at the time of the incident. They were working with a ground controller also in position. As ADC they had 5 aircraft on frequency, 4 Tutors and 1 Chinook. The Chinook was on the eastern grass conducting a crew change before his CPT SID departure, when he called for line up he was instructed to hold due to 1 Tutor on final cleared to use the runway, one on a continue and two downwind. The UT prioritised the Chinook for departure and made a decision, when it was safe to do so, to give a clearance for the second Tutor to land. Once the Tutor was on the ground, the Chinook was given a clearance to line-up and the first Tutor downwind was instructed to go around. The Tutor reported deadside just before the Chinook reported ready for departure. The Chinook was given a clearance to take off, immediately after departure he called changing to Approach. At that point the Supervisor, who was in the VCR, pointed out the Chinook and Tutor. The UT noticed that the Chinook had turned downwind and called him on frequency. He reported that he was joining downwind as he had just had an Airprox with another aircraft in the circuit.

She perceived the severity of the incident as 'Low'.

THE BENSON SUPERVISOR reports that due to the 'circuit full' light being on, and the ADC controller being under training, he positioned himself in the VCR between ADC and the ground controller. He was aware of the potential confliction but because the Tutor was in the visual circuit and would have known the Chinook had just been cleared for take-off he was not unduly worried. With about 10 seconds to go before the point of confliction, he said loudly that it looked 'very close'; unfortunately, it was too late to make any difference. He got the tower screen and controller under training out of ADC as soon as possible in order to debrief, and subsequently fill in the DASOR whilst it was fresh in their minds. He spoke to the Tutor pilot after he landed; he was visual with the Chinook, believed he was separated enough, and didn't seem overly concerned. He then spoke to the Chinook instructor who believed that had their courses carried on, then a collision would have taken place. The Tutor pilot, like himself, was keen to get air traffic and pilots in the room together to debrief the situation, but following his conversation with the Chinook pilot he thought it best that the safety management process should be followed to allow a full investigation to be completed.

Factual Background

The weather at Benson was recorded as follows:

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SPECI EGUB 041014Z 18006KT 8000 -DZ FEW011 BKN039 09/08 Q1010 BLU TEMPO 7000 SCT010 GRN
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Analysis and Investigation

Military ATM

An Airprox occurred on 4 Nov 16 at approximately 1030hrs UTC, at RAF Benson, between a Tutor in the visual circuit and a Chinook conducting an instrument departure. The Tutor was receiving an Aerodrome Service from Benson Tower and the Chinook was changing frequency from Benson Tower to Benson Approach.

Portions of tape transcripts between Benson TWR, the Tutor and the Chinook are below:

From	To	Speech Transcription	Time
[CHINOOK C/S]	Tower	[Chinook C/S] ready for taxi to runway one nine.	10:29:04
Tower	[CHINOOK C/S]	[Chinook C/S] Benson tower hold.	10:29:09
[CHINOOK C/S]	Tower	Hold [Chinook C/S].	10:29:11
[TUTOR C/S]	Tower	[Tutor C/S] downwind for glide touch and go.	10:29:24
Tower	[Tutor#2 C/S]	[Tutor#2 C/S] cleared to land one on.	10:29:30
[Tutor#2 C/S]	Tower	Land [Tutor#2 C/S]	10:29:31
[TUTOR C/S]	Tower	[Tutor C/S] downwind glide touch and go.	10:29:42
[TUTOR C/S]	Tower	[Tutor C/S] one ahead surface wind one eight zero, zero six knots.	10:29:44
[TUTOR#3 C/S]	Tower	[Tutor#3 C/S] ready for departure.	10:29:47
Tower	[TUTOR#3 C/S]	[Tutor#3 C/S] Benson tower hold	10:29:50
[TUTOR#3 C/S]	Tower	Hold [Tutor#3 C/S].	10:29:52
[TUTOR#4 C/S]	Tower	[Tutor#4 C/S] downwind to initial.	10:29:56
Tower	[TUTOR#4 C/S]	[Tutor#4 C/S].	10:29:58
[TUTOR C/S]	Tower	[Tutor C/S] finals.	10:30:10
Tower	[TUTOR C/S]	[Tutor C/S] go around.	10:30:15
[TUTOR C/S]	[TUTOR C/S]	Go around [Tutor C/S].	10:30:19
Tower	[CHINOOK C/S]	[Chinook C/S] line up Yankee runway one nine report ready for departure.	10:30:20
Tower	[CHINOOK C/S]	[Chinook C/S] line up x-ray runway one nine report ready for departure.	10:30:30
[CHINOOK C/S]	Tower	[Chinook C/S] taxi, wilco.	10:30:32
[Tutor#2 C/S]	Tower	[Tutor#2 C/S] vacated to ground.	10:30:36
Tower	[Tutor#2 C/S]	[Tutor#2 C/S]	10:30:38
[TUTOR C/S]	Tower	[Tutor C/S] dead side.	10:30:58
[CHINOOK C/S]	Tower	[Chinook C/S] is ready for departure.	10:31:03

From	To	Speech Transcription	Time
Tower	[CHINOOK C/S]	[Chinook C/S] clear for take-off surface wind one eight zero, zero six knots.	10:31:06
[CHINOOK C/S]	Tower	Clear for take-off [Chinook C/S].	10:31:08
Tower	[TUTOR#3 C/S]	[Tutor#3 C/S], line up.	10:31:11
[TUTOR#3 C/S]	Tower	Line up, [Tutor#3 C/S] .	10:31:13
?	Tower	??? Instrument traffic.	10:31:16
Tower	?	??? Benson Tower, say again.	10:31:18
?	Tower	The instrument traffic.	10:31:20
Tower	?	??? Instrument traffic, traffic.	10:31:23
[CHINOOK C/S]	Tower	[Chinook C/S] is airborne, stud 3.	10:31:34
Tower	[CHINOOK C/S]	[CHINOOK C/S]	10:31:36
Tower	[TUTOR#3 C/S]	[Tutor#3 C/S] cleared for take-off surface wind one eight zero, zero six knots, caution rotor downwash.	10:31:55
[TUTOR#3 C/S]	Tower	Cleared for take-off, [Tutor#3 C/S]	10:32:02
Tower	[CHINOOK C/S]	[Chinook C/S] Benson Tower are you still on this frequency?	10:32:35
[CHINOOK C/S]	Tower	[Chinook C/S] joining downwind for runway one nine, errr, not a hundred per cent sure of all the circuit traffic at the moment, just had an Airprox with one on departure.	10:32:37
Tower	[CHINOOK C/S]	[Chinook C/S] roger join runway one nine, QFE one zero zero three, two in.	10:32:48
[CHINOOK C/S]	Tower	Join and visual with one downwind, err, [CHINOOK C/S], just currently climbing to one thousand feet coming around the edge of Ewelme, could you just tell me the location of the circuit traffic please?	10:32:57
Tower	[CHINOOK C/S]	[CHINOOK C/S], one downwind one joining via initials.	10:33:09
[CHINOOK C/S]	Tower	[CHINOOK C/S], visual.	10:33:14
Tower	[CHINOOK C/S]	[CHINOOK C/S], one upwind.	10:33:16
[CHINOOK C/S]	Tower	[Chinook C/S] visual with the one up wind I will be turning finals behind him.	10:33:21

Portions of the tape transcripts between the Benson App Controller and the Chinook are below:

From	To	Speech Transcription	Time
[CHINOOK C/S]	Approach	Benson approach [Chinook C/S] on climb out following the Compton SID passing, err approaching four hundred feet on one zero zero three. Requesting traffic service.	10:31:40
Approach	[CHINOOK C/S]	[Chinook C/S] Benson approach identified traffic service Benson QNH one zero one zero, traffic right correction twelve o'clock half a mile crossing right left indicating one hundred feet above.	10:31:58
Approach	[CHINOOK C/S]	That's believed to be circuit traffic.	10:31:13
[CHINOOK C/S]	Approach	[Chinook C/S] now visual in the circuit and we will be reporting an Airprox about that err on that aircraft joining behind downwind for runway one nine.	10:32:16
Tower	[CHINOOK C/S]	[Chinook C/S] roger continue with tower stud two.	10:32:27
[CHINOOK C/S]	Tower	Tower stud two [CHINOOK C/S].	10:32:29

At 10:31:06 (Figure 1), the Chinook was cleared for take-off with the Tutor going around to deadside.



Figure 1: Geometry at 10:31:06



Figure 2: Geometry at 10:31:36

(Tutor SSR 7010 going around; Chinook not seen)

At 10:31:36 (Figure 2), the Chinook was airborne and transferred from Benson Tower to Benson Approach while the Tutor was mid-point dead side.

At 10:31:40, the Chinook pilot checks in with Benson Approach while climbing through 400ft QFE, requesting a Traffic Service. The Benson Approach controller passed TI on the Tutor, which was then in the Chinook's 12 o'clock, half a mile, crossing right to left, indicating 100ft above. The Chinook pilot reported visual with the Tutor and said that they would join behind, downwind, due to the Airprox. The Chinook was first visible on the radar replay at 10:32:23 (Figure 3).



Figure 3: Geometry at 10:32:23
(Tutor SSR 7010; Chinook SSR 3610)



Figure 4: Geometry at 10:32:37
(Tutor SSR 7010; Chinook not seen)

At 10:32:37 (Figure 4), the Chinook changed back to Benson Tower frequency and reported joining downwind to land. They stated that they were not certain of the position of all circuit traffic and that they had just had an Airprox.

At 10:33:27 (Figure 5), the Chinook became visible once again on the radar replay while positioning downwind to land.

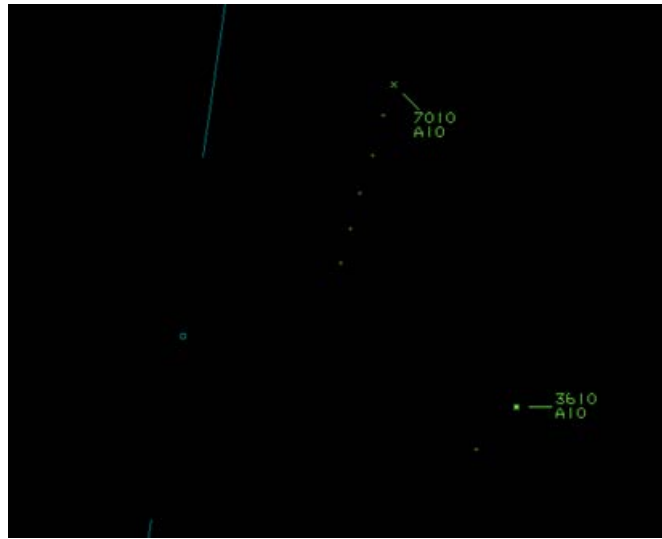


Figure 5: Geometry at 10:33:27 (Tutor SSR 7010; Chinook SSR 3610)

The Chinook had conducted a crew change on the Eastern grass prior to an instrument departure. Once ready to line up, the aircraft was initially held as a Tutor had been cleared to use the runway. Once a take-off clearance was given, the Chinook lined up on the runway and a crewman called visual with a Tutor dead side, which he perceived to be approx. 200m to the right and at 500ft. As the handling pilot conducted the simulated IF departure, the non-handling pilot advised the Tower controller of their frequency change to Benson Approach. The crewman provided updated TI that the Tutor was now converging, followed by a call for avoiding action. The non-handling pilot became visual with the Tutor crossing right to left, took control and initiated an avoiding action turn and descent.

The Tutor was operating in the visual circuit and was on his 5th circuit, a glide circuit at 1500ft QFE (standard Tutor circuit height 800ft QFE). The pilot was aware of a Chinook on the Eastern grass and had heard an instrument departure clearance passed by the Tower controller. The Tutor was instructed to go around and began a descent to standard circuit height. When the Tutor pilot called dead side, he was visual with the Chinook on the runway, but as he proceeded dead side he lost visual contact with the Chinook, who was airborne and changing to Benson Approach. The Tutor pilot dipped his wing repeatedly to regain visual contact and, once visual, elected to turn left to position downwind.

The Benson Tower controller was under training, with a Ground controller in situ and with 4 Tutors and one Chinook on frequency. When the Chinook called ready for departure, there was one Tutor cleared to land, another on a continue, and 2 more downwind. The Tower controller made a plan to allow the Chinook to depart after the Tutor on a continue had landed, therefore instructed the first Tutor downwind to go around. Said Tutor called deadside, abeam the RW 19 threshold, as the Chinook was cleared for take-off and then immediately changed frequency to Benson Approach. When the Supervisor voiced concern over the proximity of the Tutor and the Chinook, the Tower controller transmitted to ask if the Chinook was still on frequency, to which he received an affirmative response that the Chinook was joining downwind for recovery due to the Airprox.

Due to the Tower controller being a UT and the visual circuit being full, the Benson Supervisor was present in the Visual Control Room (VCR). He was aware of the potential for confliction but was not overly concerned as the Tutor had been in the visual circuit and able to hear all transmissions between the Chinook and the Tower controller to gain Situation Awareness (SA) and deconflict. As the 2 aircraft grew closer, he became more concerned about their proximity; however, he was unable to offer any intervention by that time

The Benson Approach controller identified and agreed a TS with the departing Chinook and immediately passed TI on the Tutor traffic in its 12 o'clock, half a mile, crossing right to left, indicating 100ft above. The Chinook reported visual and stated that they would now be joining behind the Tutor, downwind, due to the Airprox.

A local investigation determined that the crews involved in the Airprox had differing perceptions of the hazard posed. The Tutor pilot had been operating in a busy visual circuit for some time and was content with the separation achieved from the Chinook whereas the Chinook crew, who were conducting simulated IF training, felt that, although visual with the Tutor, they were unexpectedly confronted with an aircraft cutting across their path at close range. It was not established what the Chinook crew's expectations of the Tutor were.

At the time of issuing the take-off clearance, the Benson Tower controller and Supervisor did not believe that there was a hazard because the transmissions relating to the go around and the departure could be heard by both aircraft, which should enable all aircraft to develop good SA and maintain visual contact with other aircraft in the visual circuit. This is a reasonable expectation and there is no requirement for the Tower controller to ensure that a departing aircraft is visual with circuit traffic.

Although in this incident both aircraft were visual with each other, Benson ATC have been tasked with reviewing the procedures for releasing IFR departures when there are aircraft in the visual circuit, paying particular attention to traffic dead side and to the point of departure utilised. This review is ongoing.

UKAB Secretariat

The Chinook and Tutor pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard¹. An aircraft operated on or in the vicinity of an aerodrome shall conform with or avoid the pattern of traffic formed by other aircraft in operation².

Comments

HQ Air Command

This Airprox was the subject of a local investigation which uncovered some lessons for all sides. Chinook flying from RAF Benson is still relatively new and this change to the station's operations brings together two types (Chinook & Tutor) for the first time. Prior to flying at RAF Benson, student Chinook crewmen would quite likely have only flown at RAF Shawbury and possibly RAF Odiham, both of which have very little exposure to fixed-wing platforms. During the local investigation, it became apparent that junior crewmen in particular may not be familiar with fixed-wing circuit procedures and radio calls, such as 'dead-side'. The crewman in this case clearly called that he was visual with the Tutor and gave the key phrases "clear above and behind" and "my padlock" (he/she will keep eyes on the other aircraft); however, it appears that the Tutor manoeuvre to re-join the live side of the circuit caught him/her by surprise. RAF Benson have now raised an action to ensure that all crews (including crewmen) arriving at RAF Benson from another unit will receive a compulsory brief on the circuit procedures at RAF Benson with extra emphasis on fixed- and rotary-wing interaction, there will also be efforts to provide fixed-wing air experience flights to all new aircrew (especially rear-crew) to demonstrate their circuit profile and the Tutor field of view. The local investigation also noted that the Chinook, having considerably more power available, has a different Instrument Flying departure profile (with a very high rate of climb). Tutor crews have become accustomed to sharing the circuit with Puma and Merlin platforms, who share similar flight profile, when launching on an instrument departure, and could be taken by surprise by the rate of climb and separation from Chinooks. This Airprox report will

¹ SERA.3205 Proximity.

² SERA.3225 Operation on and in the Vicinity of an Aerodrome.

be used as a case study for crews at RAF Benson and will also be sent to the RAF Shawbury Air Safety team to be considered for use as during initial rotary wing training. The incident took place in the visual circuit and the barrier of 'see and avoid' is expected to take primacy, it is clear that there were different perceptions of the severity of the incident.

JHC

Although the UKAB Secretariat comments regarding the Chinook and Tutor pilots sharing an equal responsibility for collision avoidance are supported, it is apparent that there was little more that the Tutor pilot could have done to avoid this conflict; this is not the case for the Chinook crew. Rotary Wing pilots are taught at an early stage of training to ensure that their departure path will be clear of conflicts despite having a departure clearance from ATC – at DHFS Squirrel pilots are taught to conduct a spot turn to clear the area above and behind the aircraft following receipt of an ATC departure clearance before transitioning. On graduating to multi-crew aircraft, the Captain/Handling Pilot learns to rely on the crewman's lookout rather than conducting spot turns. If the Captain/Handling Pilot receives a "clear above and behind" from the crewman then they can be confident in transitioning to forward flight. If anything other than a "clear above and behind" is heard then the Captain/Handling Pilot should ensure they have full situational awareness of other aircraft flight paths before transitioning at an appropriate point to fit in to the flow of traffic. In this Airprox the Chinook crew transitioned into conflict with the Tutor, who continued to fly the standard pattern whilst trying to maintain visual with the Chinook almost directly below him.

The review being conducted by RAF Benson ATC in to their procedures for releasing IFR departures when there are aircraft in the visual circuit is welcomed, as in this case it may have been prudent to delay the departure clearance slightly until the Tutor was ahead of the Chinook and visual to the pilots (or perhaps to have issued a conditional clearance). Ultimately, the Chinook crew should not have transitioned into conflict, despite having a departure clearance from ATC.

Summary

An Airprox was reported when a Chinook and a Tutor flew into proximity at 1030 on Friday 4th November 2016. Both pilots were operating under VFR in VMC, the Chinook pilot in receipt of an Aerodrome Service from Benson Tower and a Traffic Service from Benson Approach, and the Tutor pilot in receipt of an Aerodrome Service from Benson Tower.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from the pilots of both aircraft, transcripts of the relevant RT frequencies, radar photographs/video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

The Board began their discussion with a military member summarising the RAF Benson review of the incident prior to the Board meeting. He said that the Chinook had only recently started operating at Benson as a permanent asset, and went on to explain that although the airfield has seen a mixture of helicopter and light aircraft operations in the past, the difference between the Puma and the Chinook is sometimes not necessarily appreciated - especially the ability of the Chinook to climb faster than the Puma. He opined that this may have been a factor in the Chinook and Tutor being in closer proximity than the Tutor pilot planned as he turned, and therefore the Chinook pilot being startled by the Tutor turning across his flight path. He also commented on rear-crew understanding of visual circuits; when they are under basic training they don't experience fixed-wing circuits and therefore the actions of the Tutor pilot may have been unexpected during what are normal fixed-wing operations. Being perhaps surprised when the Tutor pilot turned across the departing Chinook, this lack of experience exacerbated the situation because the rear crewman was the only crew member visual with the Tutor.

The Board then looked at the actions of Air Traffic Control. Members acknowledged that the visual circuit was busy and that the controllers had created a gap in the circuit flow to allow the Chinook to depart. Having done this, members wondered why the controllers had then released the Chinook when the Tutor was in such proximity as it went around from the glide approach. Some controller members opined that a controller's only responsibility was to ensure that the runway was clear before releasing aircraft, and that the departing aircraft must maintain their own separation from circuit traffic. In essence, their view was that the release of the Chinook had only been an invitation for the Chinook pilot to depart, not a guarantee that there would be no conflicting traffic to affect. Taking a contrary view, other members felt that this was not the case and that controllers must ensure that an aircraft's initial departure route is clear so that they can safely depart during a time of high cockpit workload, especially because the Chinook crew were simulating an IF departure. The Board agreed that, notwithstanding the fact that pilots share an equal responsibility for collision avoidance, controllers also have a duty of care to ensure that they do not release aircraft to depart unless they can safely climb on their requested profile; given the intentions of both the Tutor and the Chinook pilots, the prospect for the aircrafts' flight paths to cross was highly likely, and so members felt that the controllers should not have given the Chinook a release clearance.

The Board then turned to the actions of the Chinook pilot. They agreed that, regardless of the rear crewman accepting responsibility for the visual acquisition and tracking of the Tutor, the Chinook pilot would have been better served by delaying his departure until he could see the Tutor. Accepting that under IFR conditions and departing on a SID there would be a degree of urgency to contact Approach, some members wondered why the Chinook pilot had changed frequency so quickly before leaving the circuit pattern. This had effectively reduced his ability to hear any traffic information from the tower controller or other circuit traffic, thereby removing this means of increasing his situational awareness. The Board opined that it would have been safer for this frequency change to have been delayed until the aircraft was safely airborne and had departed the environs of the visual circuit.

For his part, the Board noted that the Tutor pilot was visual with the Chinook prior to turning across the runway from the deadside. Knowing that the Chinook was departing IFR on a SID as he commenced his go-around, members opined that the Tutor pilot would have been better served by either turning downwind early behind the Chinook as it lifted, delaying his turn until he could see the Chinook was well above his level as it climbed out, or repositioning from deadside to rejoin the circuit. Turning across the Chinook's path had resulted in him suddenly appearing in the Chinook pilot's line of sight and likely startling the Chinook pilot who then made an avoiding action turn.

The Board then looked at the safety barriers that were relevant to this Airprox and decided that the following were the key factors:

- **Airspace Design and Procedures** was assessed as being **partially effective** because current procedures allowed the Chinook pilot to change to the Approach frequency whilst effectively still part of the visual circuit; this serves not only to limit the Chinook pilots awareness of circuit traffic but also prevents any instructions the tower controller may need to convey at the early stage of flight within the visual circuit.
- **ATC Conflict Detection and Resolution** was considered **ineffective** because the tower controller released the Chinook with the Tutor in close proximity and, although the Supervisor noticed the proximity of the Tutor and Chinook to each other, the controller did not detect the confliction early enough to carry out sufficient control to prevent the situation from occurring.
- **Situational Awareness** was assessed as being **partially effective** because although all the aircraft were initially on the same frequency, the Chinook pilot's SA was reduced when he changed frequency with only a generic and arguably misinformed awareness of the other aircraft's position from the No2 crewman.

- **See and Avoid** was assessed as being **partially effective** because: a) the Chinook pilot was initially not visual with the Tutor and was relying on the No2 crewman to maintain visual contact and update him; b) the No2 crewman may have misinterpreted the Tutor's flightpath; c) when the Chinook pilot gained visual contact with the Tutor he considered that he needed to carry out emergency avoiding action to maintain separation; and d) the Tutor pilot was initially visual with the Chinook, lost contact as he passed by, and then only became visual again just before he turned downwind.

The Board then debated the cause of the incident at much length. Some members opined that the Chinook had been released into conflict with the Tutor; whilst others pointed out that, it was the Chinook pilot's responsibility to ensure that he did not fly into conflict with the Tutor. Others opined that the Tutor pilot had flown into conflict by turning across the Chinook's path as it departed. It was clear to the Board that all of the parties involved could have done better, and that this incident rather highlighted the risks of operating in uncontrolled military circuits where the pilots had ultimate responsibility for their sequencing and separation. Recognising that in accordance with military Air Traffic regulations the Chinook and Tutor pilots were responsible for ensuring they remained separated from each other, but also acknowledging the duty that the controllers had in ensuring a safe release path, the Board decided that the incident could not be attributed to any specific action and that it was therefore probably best described as a conflict in the visual circuit. In order to capture the related actions, the Board agreed that contributory factors were: the Tutor pilot turning across the departing Chinook's track; ATC releasing the Chinook with the Tutor in close proximity; and the Chinook not integrating with the Tutor in the visual circuit. Turning to the risk, the Board agreed that although safety had been degraded, there had not been a risk of collision because the Tutor pilot had been visual with the Chinook, as he had turned across its path. Therefore, the Board assessed the risk as Category C.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A conflict in the visual circuit.

Contributory Factor(s):

1. The Tutor pilot turned across the departing Chinook's track.
2. ATC released the Chinook with the Tutor in close proximity.
3. The Chinook crew did not integrate with the Tutor in the visual circuit.

Degree of Risk: C.

Barrier Assessment³:

Modern safety management processes employ the concept of safety barriers that prevent contributory factors or human errors from developing into accidents. Based on work by EASA, CAA, MAA and UKAB, the following table depicts the barriers associated with preventing mid-air-collisions. The length of each bar represents the barrier's weighting or importance (out of a total of 100%) for the type of airspace in which the Airprox occurred (i.e. Controlled Airspace or Uncontrolled Airspace).⁴ The colour of each bar represents the Board's assessment of the effectiveness of the associated barrier in this incident (either Fully Effective, Partially Effective, Ineffective, or Unassessable/Absent). The chart thus illustrates which barriers were effective and how important they were in contributing to collision avoidance in this incident.

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

⁴ Barrier weighting is subjective and is based on the judgement of a subject matter expert panel of aviators and air traffic controllers who conducted a workshop for the UKAB and CAA on barrier weighting in each designation of airspace.

Airprox Barrier Assessment: 2016232.

Outside Controlled Airspace

