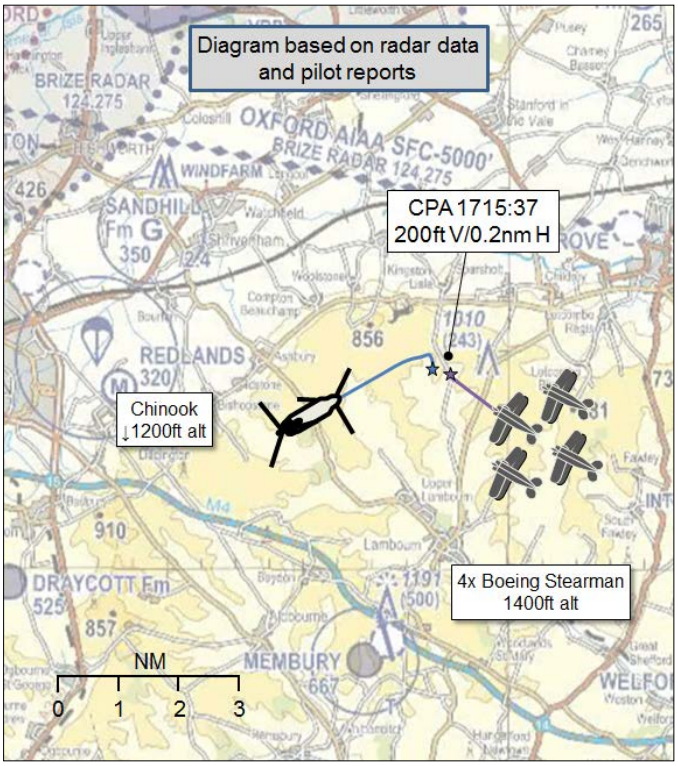
AIRPROX REPORT No 2016129

Date: 07 Jul 2016 Time: 1715Z Position: 5133N 00131W Location: 12 WSW Benson

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Chinook	4x Boeing Stearman
Operator	HQ JHC	Civ Pte
Airspace	Lon FIR	Lon FIR
Class	G	G
Rules	VFR	VFR
Service	Traffic	Basic
Provider	Benson	Fairford
Altitude/FL	1600ft	1400ft
Transponder	A, C, S	A, C, S
Reported		
Colours	Green	Orange, White
Lighting	Nav, Strobes, Landing	
Conditions	VMC	VMC
Visibility	15km	50km
Altitude/FL	1300ft	1300ft
Altimeter	QNH (1018hPa)	QNH (1016hPa)
Heading	170°	300°
Speed	NK	90kt
ACAS/TAS	Not fitted	Not fitted
Separation		
Reported	200ft V/300-400m H	0ft V/1nm H
Recorded	200ft V/0.2nm H	



THE CHINOOK PILOT reports that they were conducting a training sortie, including conducting PFLs on instruments, with the RHS pilot flying under the IF training visor. The aircraft was at 3000ft and heading 040° and the controller had previously called traffic well clear to the south east of the aircraft. Just prior to entry to a PFL the controller called further traffic 12 o'clock, but heading east, away from the intended PFL area. The crew (except the pilot under the visor) checked down and right of the aircraft, and the RHS pilot initiated the PFL by commencing a right turn and descending. At around 1400ft the No 1 crewman (rear left) called, in a forceful manner, traffic close in the 8 o'clock. The QHI took control, rolled wings level, and discontinued the descent; he was then just able to see a formation of 4 high-winged aircraft passing behind. The crew maintained visual with the traffic and, when sure it was clear, they climbed back to height for a radar recovery. Post-event, the controller reported that no traffic was visible on the radar anywhere near them. The crew described the aircraft as 4 high-wing single-engine aircraft, in a diamond formation.

He assessed the risk of collision as 'Medium'.

THE BOEING STEARMAN PILOT reports that he was leading a 4-ship VFR transit in loose box formation to Fairford. They were talking to Fairford Approach and were wearing a Fairford squawk. He saw the Chinook when it appeared head-on, landing lights on, high in the 11-12 o'clock descending out of cloud, he thought, in a right hand turn. The closest that he came to the formation was 1nm as it continued a descending right turn through their level and headed west in their 9 o'clock position. Fairford radar said nothing, but his right-hand wingman called 'Chinook ahead' which he acknowledged. He didn't take avoiding action because he didn't deem it to be a threat; they were maintaining straight-and–level, and to turn 4 aircraft in formation would, in his opinion, have caused safety issues. The aircraft were vintage 1940s aircraft, each with a radio and transponder, but with no

other navigation aids or TCAS, are VFR only, and each carried 1 POB. Although forward visibility can be limited, in this case the Chinook was visible from the moment he descended below what he thought was the cloudbase.

He assessed the risk of collision as 'None'.

THE BENSON CONTROLLER reports that he was the Approach controller at the time, he couldn't recollect his workload level at the time and his only recollection of the incident was that the Chinook pilot mentioned in a 'relaxed' tone that he had flown over some wing-walker aircraft. Nothing was showing on the radar at the time.

Factual Background

The weather at Benson was recorded as follows:

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METAR EGUB 071650Z 24008KT 9999 FEW035 BKN045 21/13 Q1017 BLU NOSIG=
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Portions of the tape transcripts between Benson Approach and the Chinook are below:

From	To	Speech Transcription	Time
Benson Approach	Chinook	[Chinook c/s] traffic north west three miles tracking east indicating similar level	17:13:21
Chinook	Benson Approach	Traffic not sighted [Chinook c/s]	17:13:27
Chinook	Benson Approach	[Chinook c/s] traffic sighted	17:14:07
Benson Approach	Chinook	[Chinook c/s]	17:14:10
Benson Approach	Chinook	[Chinook c/s]have further traffic east two and a half miles, tracking north west (pop up) on site, no height information, possibly a glider	17:14:30
Chinook	Benson Approach	We'll be ,uh, descending [Chinook c/s]	17:14:40
Chinook	Benson Approach	Approach [Chinook c/s]	17:15:53
Benson Approach	Chinook	[Chinook c/s] send	17:16:14
Chinook	Benson Approach	[Chinook c/s] we've just had a formation of four pass directly, uh, beneath us. At the previously called traffic I , I, understood it was going away from us before we descended	17:16:18
Benson Approach	Chinook	Yeah I've got nothing showing anywhere near you at the moment	17:16:27
Chinook	Benson Approach	Uh, roger, it's four wing walkers in formation. Uh, we just, uh, missed them. Uh, we're just working out where they are now.	17:16:32
Benson Approach	Chinook	[Chinook c/s], uh, that is copied, they must be below my radar cover	17:16:41
Chinook	Benson Approach	Err, that's copied [Chinook c/s]	17:16:46
Chinook	Benson Approach	[Chinook c/s], uh, now general handling complete looking for radar pick up, eh, vectors for the ILS Runway 19.	17:19:27

Analysis and Investigation

Military ATM

At 1713:32 (Figure 1), the Chinook is tracking north climbing to position for a PFL, the Boeing Stearman formation is to the east of the Chinook tracking north west in level flight enroute to Fairford. The controller has passed the Chinook Traffic Information on the 7000 squawk to the North West at a similar level. No Traffic Information was passed on the 4207 squawk directly to the north of the Chinook indicating 010 on Mode C or the Boeing Stearman formation to the east. This would suggest that it was not visible on the controller's radar screen as these would have been relevant calls at this point.

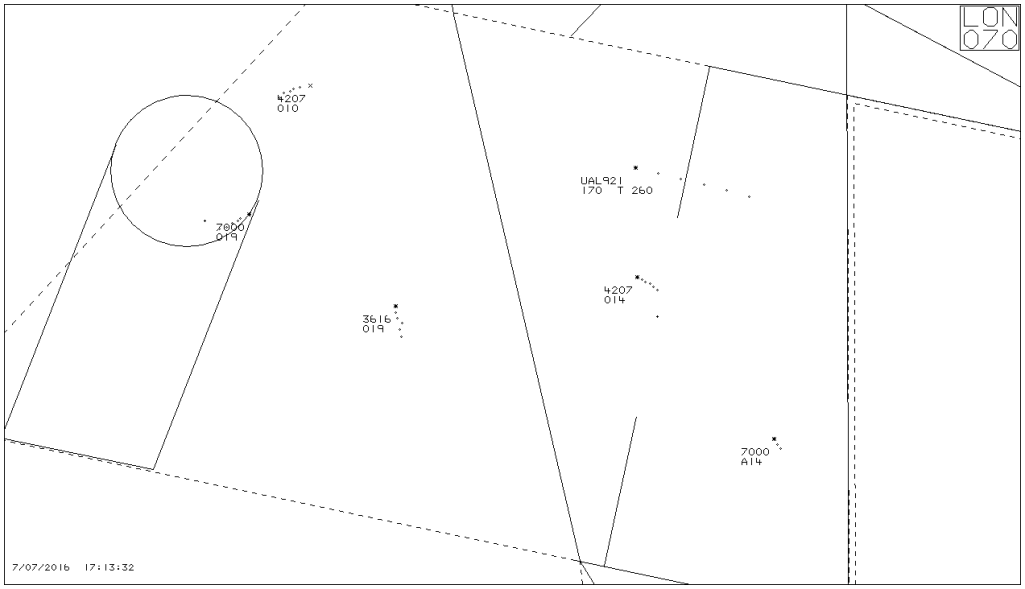


Figure 1: Geometry at 1713:32 (Chinook squawking 3616; Boeing Stearman formation squawking 4207, Mode C 014).

At 1714:19 (Figure 2), the Chinook is now visual with the aircraft squawking 7000 to the North West and begins to turn right and position to begin the PFL. The Boeing Stearman formation continues tracking northwest converging toward the Chinook.

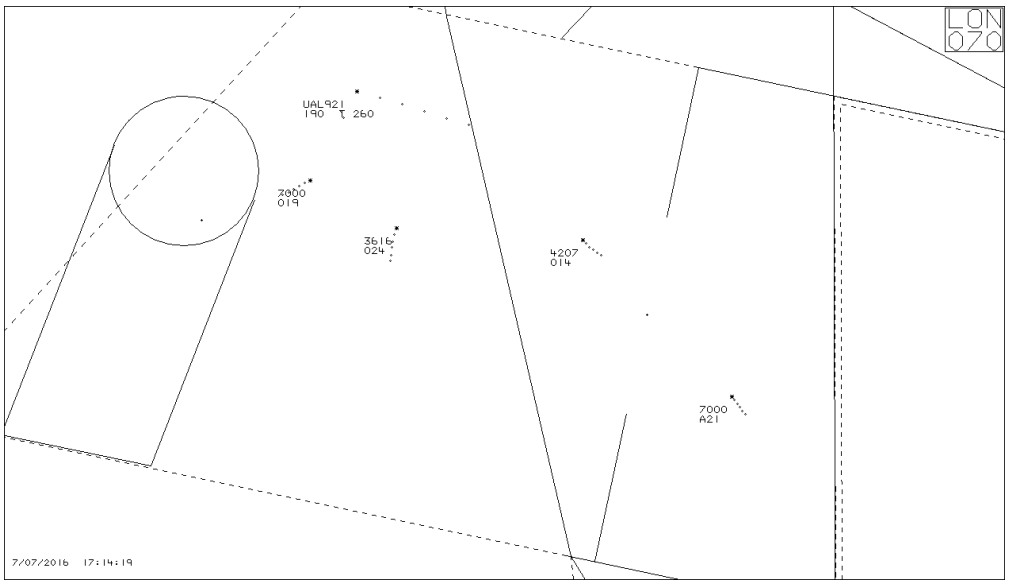


Figure 2: Geometry at 1714:19 (Chinook squawking 3616; Boeing Stearman formation squawking 4207, Mode C 014).

At 1714:34 (Figure 3), the controller passes the Chinook Traffic Information *'[Chinook c/s] have further traffic east two and a half miles, tracking north west (pop up) on site, no height information, possibly a glider'*. This traffic call would indicate that for a moment the Boeing Stearman formation created a small return on the controller's radar screen.

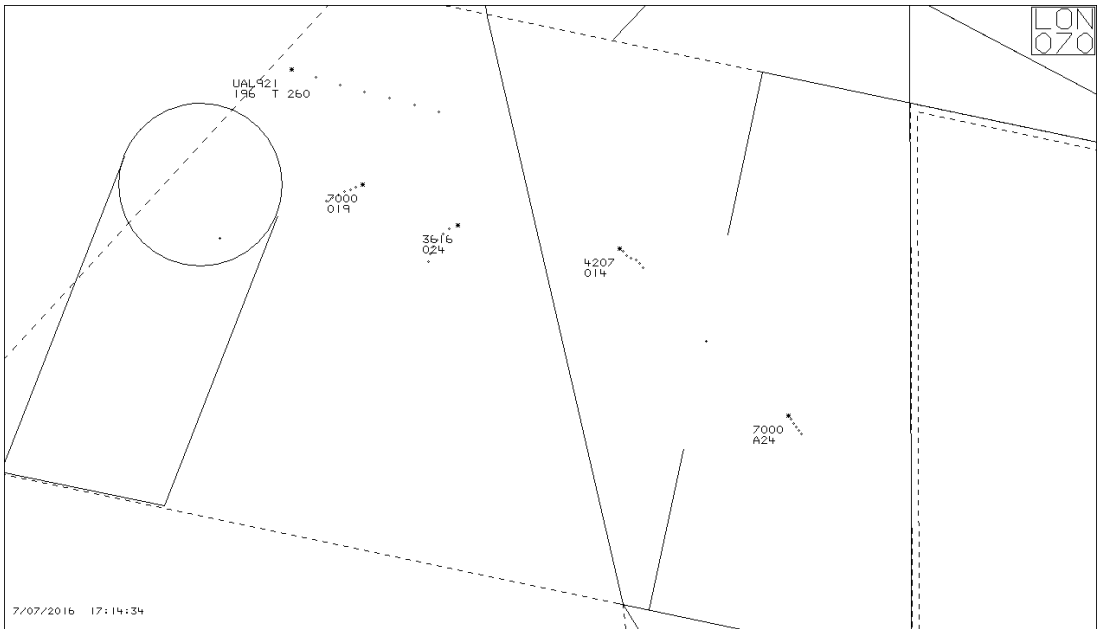


Figure 3: Geometry at 1714:19 (Chinook squawking 3616; Boeing Stearman formation squawking 4207, mode/C 014).

At 1715:24 (Figure 4), the Chinook is in the descent, passing 018 on Mode C, through the 12 o'clock of the Boeing Stearman formation. This correlates with the Boeing Stearman pilots report of becoming visual with the Chinook as it descended 'out of cloud' in their 11/12 o'clock in a right hand descending turn [UKAB Note: the Chinook crew report that they were VMC at all times]. Separation at this point it 0.6 nm and 400 ft.

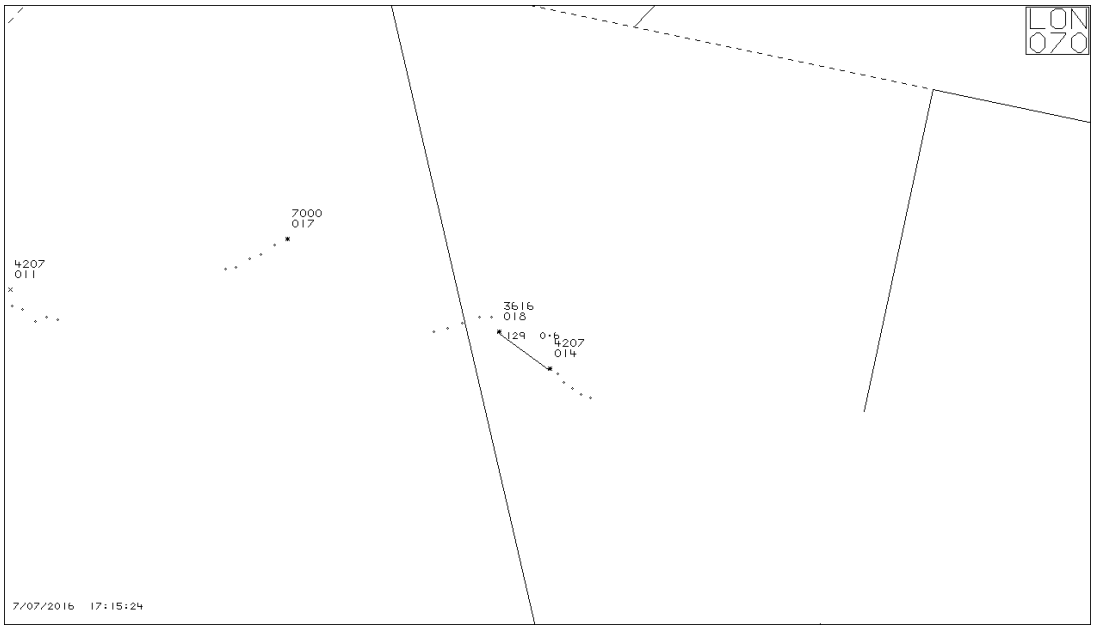


Figure 4: Geometry at 1715:24 (Chinook squawking 3616; Boeing Stearman formation squawking 4207, Mode C 014).

The Chinook pilot reported being in receipt of a Traffic Service and the controller had passed Traffic Information on two different contacts that were away from their intended PFL area. The pilot reports descending shortly after the Traffic Information call at 17:14:30, this would correlate with the response at 17:16:18 and would indicate the pilot has assimilated the traffic information incorrectly believing there was no threat to the PFL area and manoeuvre. The PFL was initiated with a right-hand turn and descending; at around 1300ft the rear left crewman called traffic in the 8 o'clock position.

The Controller reported their only recollection of the incident was the Chinook pilot mentioning in a relaxed tone having flown over some wing-walker aircraft, and that nothing was showing on radar at the time. Further discussion with the controller indicated that the location of the Airprox has poor primary and secondary radar coverage at low level. The tape transcript shows the controller called a pop-up contact to the Chinook at 17:14:30; this correlates with the radar replay and the position of the Boeing Stearman formation. The lack of prior Traffic Information or further updates would imply that the Boeing Stearman formation were either below radar cover or presenting a poor radar aspect.

The Stearman pilot reported flying in a loose box formation at 1300ft QNH. The pilot reported receiving no Traffic Information from Fairford, but became visual with the Chinook as it descended 'out of cloud' in a right-hand turn, descending through their level, heading west (in the 9 o'clock position). The pilot estimated the closest the aircraft came was 1nm. The pilot reported taking no avoiding action and felt that at no point did the Chinook pose a threat.

The primary barrier in this incident for both pilots was 'see and avoid'. The limits of radar coverage no doubt prevented the Boeing Stearman formation showing on the Benson controller's radar screen for a prolonged period of time. The controller did pass Traffic Information to the Chinook pilot on a pop up contact; it would seem that this Traffic Information was incorrectly assimilated, perhaps due to the pilot focusing on the impending PFL. This incident highlights the limitations of radar performance and the associated ATS.

UKAB Secretariat

The Chinook and Stearman 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]. If the incident geometry is considered as converging (prior to the Chinook's right-hand descending turn) then the Chinook pilot was required to give way to the Boeing Stearman formation[3].

Comments

JHC

The Chinook was operating in Class G airspace conducting a standard Simulated IFR Flight Profile. Whilst the PF was 'under a hood' there were still 3 crew-members conducting lookout. The Chinook believed he was clear to descend and turn right, but he had not seen the vintage aircraft formation, possibly due to distance/cloud between them. However, separation was maintained by the Chinook until the vintage aircraft formation was clear.

Summary

An Airprox was reported when a Chinook and a 4-ship of Boeing Stearman flew into proximity at 1715 on Thursday 7th July 2016. Both pilots were operating under VFR in VMC, the Chinook pilot in receipt of a Traffic Service from Benson and the Stearman pilot in receipt of a Basic Service from Fairford.

[1] SERA.3205 Proximity.
[2] SERA.3210 Right-of-way (c)(1) Approaching head-on.
[3] SERA.3210 Right-of-way (c)(2) Converging.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board first looked at the actions of the Chinook pilot. He was operating in Class G airspace, practising PFLs with a pilot under an IFR visor. Notwithstanding, provision had been made to mitigate this by using a look-out pilot and crew members, and an appropriate ATS; the Board thought that appropriate mitigation had been made for the circumstances. That being said, some members were concerned that the Chinook crew had turned towards previously reported traffic as they initiated their PFL. In this respect, they noted the Military ATM investigation comments that this indicated that the crew had incorrectly assimilated the Traffic Information; however, Board members could not verify that this was the case, and they worried that the crew may have become task-focused on the presumably pre-briefed PFL entry direction at the expense of assimilating at all that aircraft might be coming into conflict from that sector. However, members noted that, having seen the four Stearman aircraft during the descent, the Chinook pilot reacted swiftly to take avoiding action. Members commented that although the Stearman pilot had reported that it looked like the Chinook had come out of the cloud, it was probably more likely that cloud had simply obscured the Chinook from view rather than it being IMC *per se*.

For their part, members noted that the Stearman pilots were transiting to Fairford under a Basic Service and had reported that they didn't receive any Traffic Information on the Chinook. The Board noted that, under a Basic Service, they were unlikely to receive any and, had they wanted such information, they should have opted for a Traffic Service - particularly if they were concerned about the ease of manoeuvrability of their formation. Members observed that, having seen the Chinook early, the lead pilot had elected not to take any avoiding action, opining that it may have caused safety issues to turn the formation. The Board were concerned by this notion, with some members disputing that turning the formation would be more dangerous in comparison to the proximity of a rapidly descending Chinook that had ended up passing only 400m or so from the lead aircraft. Although they accepted that in a vintage aircraft with less than ideal visibility the pilot was probably keen to keep to his track, they warned that pilots should pro-actively avoid conflicts rather than expect or hope that others would get out of their way. That said, members noted that the Stearman pilot was obviously content with his perception of the separation even though others in his position might not have been.

In looking at the actions of the Benson controller, the Board were puzzled as to why the Stearman formation did not show up on their radar even as an SSR return given that the Chinook obviously did in the same area. One of the military ATC members informed the Board that the SSR feed for Benson was from Brize Norton, meaning that the two radar sources, Primary and SSR were in different locations, adding to the mystery. Noting that the controller did give plenty of Traffic Information, the Board were content that he would have called the confliction had he seen it; indeed, some members thought that his call at 1714:30 regarding pop-up traffic could well have been the Stearman formation.

Looking at the barriers that were not effective in this Airprox; 'ATS threat awareness' and 'Flt Crew acting on information' did not appear to contribute because the Stearman formation had not shown up on the Benson radar (so the controller was unable to give Traffic Information), and the Stearman formation was only under a Basic Service and therefore could not expect to receive Traffic Information. That being said, the Board suspected that the Chinook pilots had been given Traffic Information on the Stearman formation just before the PFL descent, but had simply not assimilated it. None of the aircraft in this incident had a TAS fitted, meaning that neither pilot received any information to act upon from this source and thus making that barrier unavailable. See-and-avoid was deemed to be partially effective, in that the Chinook crew only saw the Stearman formation just before or at CPA, later than he would have liked, and took avoiding action; for their part, the Stearman formation saw the Chinook early, but did not think that any avoidance was required.

This led the Board onto determining the cause of the Airprox, which they quickly agreed was a late sighting by the Chinook pilot. The risk was assessed as Category C; although safety had been degraded, there had been no risk of collision because the Chinook pilot took effective avoiding action.

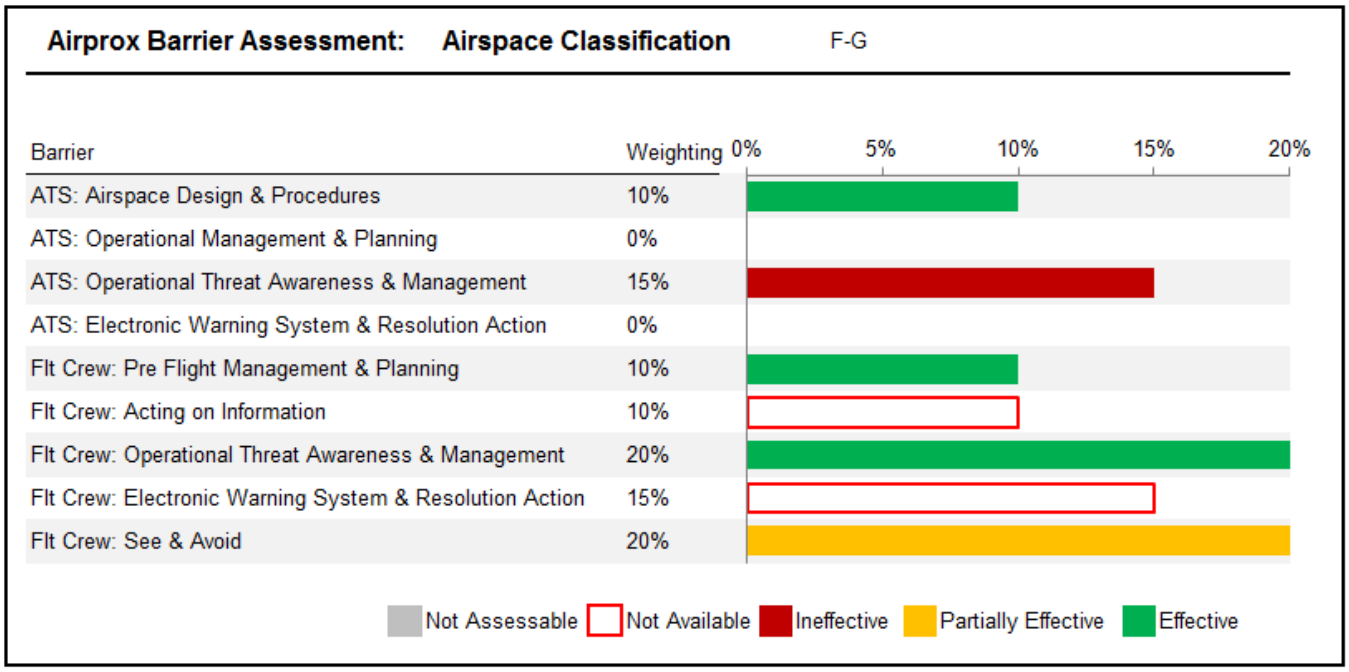
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A late sighting by the Chinook pilot.

Degree of Risk: C.

Barrier Assessment:

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).[1] 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, Not Available, or Not Assessable). The chart thus illustrates which barriers were effective and how important they were in contributing to collision avoidance in this incident.



[1] 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.