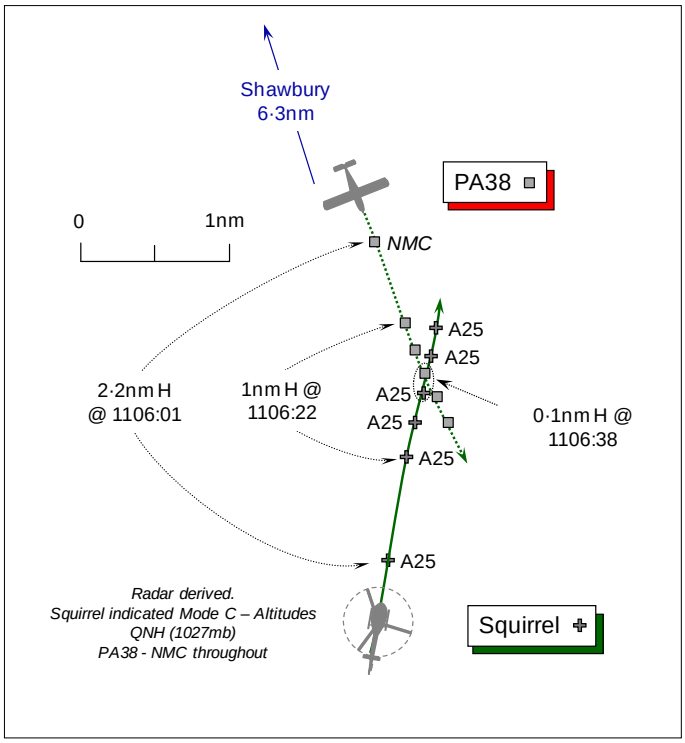
AIRPROX REPORT No 2011162

Date/Time:	23 Nov 2011 1106Z	
Position:	5242N 00235W (163° Shawbury A/D 6·3nm - elev 249ft)	
Airspace:	Shawbury AIAA	(*Class: G*)
	Reporting Ac	*Reported Ac*
Type:	Squirrel HT Mk1	PA38
Operator:	HQ Air (Trg)	Civ Trg
Alt/FL:	2200ft QFE (1014hPa)	2000ft QFE
Weather:	VMC CLOC	VMC CAVOK
Visibility:	10km	>10km
Reported Separation:	300ft V	NK
Recorded Separation:	<0·1nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SQUIRREL HT Mk1 HELICOPTER PILOT reports he was conducting an instrument training sortie from Shawbury; the PF in the RH seat was using an IF training visor. After departing 'Box 'C', which is part of the Shawbury instrument flying training area, the Squirrel was descended from 3000ft to 2200ft QFE under a TS from Shawbury APP on 282·00MHz. A squawk of A0237 was selected with Mode C; neither TCAS nor Mode S is fitted.

Heading 010° at 90kt, level at 2200ft QFE (1014hPa) in VMC with SCT cloud at 3000ft, inbound for a radar to PAR recovery to Shawbury, APP passed TI about traffic 4nm away but with no height information available; the traffic was not seen. The traffic was reported again at 3nm range without height information and remained unseen. About 2min later, a white single engine low-wing civilian light ac was first seen ¼nm away approaching from 1 o'clock on a reciprocal heading, which passed 300ft underneath his helicopter in level flight and slightly to starboard. Although in no immediate danger - he assessed the Risk as 'low' – both pilots were concerned at the late sighting and close-proximity of the ac as it passed.

His helicopter has a black/yellow colour-scheme; the HISLs and landing lamp were on.

THE PIPER PA38 TOMAHAWK PILOT reports he was conducting an instructional VFR flight with a student routeing from Hawarden direct to a turning point just S of Telford at 90kt, in a level cruise at 2000ft Shawbury QFE. Following the MATZ transit, he was in receipt of a BS from Shawbury RADAR (LARS) on 120·775MHz. The assigned squawk of A0241 was selected; neither TCAS, Mode C nor Mode S are fitted.

As they cleared the summit of the hill to the SW of Telford [after the Airprox occurred], heading 150° slightly into Sun, they began an 80kt cruise climb to 2300ft QFE to clear the operating cooling towers ahead, informing RADAR of their new height when level. After turning at Broseley they routed NW at the same height. The helicopter flown by the reporting pilot was not seen.

His ac is coloured white with a blue stripe; the HISLs were on.

THE SHAWBURY APPROACH CONTROLLER (APP) reports he was mentor to a trainee controller on the APP position. The crew of the Squirrel helicopter was under a TS descending to 2200ft Shawbury QFE when conflicting traffic was spotted, he thought 3nm N of the Squirrel. TI was given in the correct format [and actually transmitted by the trainee at a range 4nm] and was subsequently updated, advising the Squirrel crew of the 'previously reported traffic 12 o' clock, 3 miles crossing left to right..', which the crew acknowledged. At no time did he believe there was a danger of collision as the correct TI had been passed and it was evident from his displayed radar picture that the contacts would not merge. The pilot of the Squirrel did not ask for any further TI or avoiding action, but then reported seeing a light civil ac passing about 500ft below them.

THE SHAWBURY ZONE CONTROLLER (LARS) reports taking over the position at about 1055Z; several tracks were handed over that were in receipt of a BS. One of these was a PA38 from Harwarden on a NAVEX, using the SWB beacon to transit through the Shawbury O/H from NW to SE. When he took over the operating position the PA38 crew had already been cleared through the MATZ at 2500ft QFE and then several other flights called for a BS in the area; traffic levels were moderate at the time. After the PA38 had passed through the O/H, it continued on its SSE'ly track towards The Wrekin and the Mode 'C' readout was intermittent, he thought [no Mode C is fitted to the PA38], but the weather and traffic conditions were such that he did not consider it an issue. At no point did he consider there to be any confliction or that the PA38 was likely to merge with any other contacts.

BM SAFETY MANAGEMENT reports that this Airprox occurred between a Squirrel HT1 in receipt of a TS from Shawbury APP and a PA38 in receipt of a BS from Shawbury LARS. Shawbury ATC benefits from open-microphone recording; consequently, BM SM had access to all communication between personnel within the ACR.

APP was manned by a trainee and an experienced screen controller who described their workload as 'medium to low' with minimal task complexity. Whilst LARS also described their workload as 'medium to low' with minimal complexity, the SUPERVISOR believed that the controller's workload was high to medium and this view is supported by BM SM. The controller had taken over the LARS position about 8½min before the Airprox and was providing a service to 8 ac on LARS – 5 with a BS and 3 under a TS – and bandboxed with Shawbury Low-Level.

The incident sequence commenced at 1058:15 as LARS passed TI to APP on the PA38 crossing the Shawbury CMATZ. LARS stated that the PA38 was, *"Sleap northeast 4 miles tracking south squawking 0-2-4-1 through your overhead 2 thousand feet Q-F-E",* which was acknowledged by APP. No further liaison was conducted between APP and LARS in relation to the PA38 and Squirrel. There was no liaison recorded between the SUP, APP or LARS throughout the incident sequence.

At 1104:12, APP turned the Squirrel onto N from its previous heading of 030°. By extrapolation, at this point the PA38 was 7½nm N of the Squirrel tracking SSE'ly at 2000ft Shawbury QFE, some 2.7nm SE of Shawbury crossing the CMATZ; however, the PA38 squawking A0241 was not displaying Mode C. At 1104:27, APP instructed the Squirrel crew to "*set Shawbury Q-F-E 1-0-1-4 descend to height 2 thousand 2 hundred feet*." Shawbury ATC has confirmed that the descent to 2200ft was to take account of the terrain safe level around The Wrekin, it was not to take account of the PA38 at 2000ft. At this point, the PA38 was maintaining its SSE'ly track approximately 6.4nm N of the Squirrel.

At 1105:14, APP provided TI to the Squirrel crew about the PA38 stating, "..*traffic north 4 miles* (2-sec pause) *tracking east no height information*." This TI was acknowledged by the Squirrel pilot who reported *"..roger now maintaining 2 thousand 2 hundred feet 1-0-1-4".* The radar replay shows the PA38 maintaining its SSE'ly track. At 1105:46, APP updated the TI to the Squirrel crew stating "..*previously called traffic now 12 o'clock* [radar replay shows 11 o'clock] *3 miles crossing left-right, no height information*." Analysis of the radar replay shows that the 2 ac were on constant, almost reciprocal, converging tracks from the start of the incident sequence. Subsequent to completing his written account, the Squirrel pilot has stated that the mental picture that the crew developed, based

upon this TI, was that the PA38 was no factor and would pass E of them; however, this may have been made with hindsight. APP gave no further update of TI and subsequently reported that 'at no time did he believe that there was a danger of collision…and it was evident from the radar picture that the contacts would not merge.'

CAP 774 Chapter 3 Section 5 states that:

> 'The controller shall pass traffic information on relevant traffic, and shall update the traffic information if it continues to constitute a definite hazard, or if requested by the pilot. However, high controller workload and RTF loading may reduce the ability of the controller to pass traffic information, and the timeliness of such information.'

CAP 413 Chapter 5 1.6.1 states that:

> 'Whenever practicable, information regarding traffic on a possible conflicting path should (include the) relative bearing of the conflicting traffic in terms of the 12 hour clock with the optional prefix 'left or right' as appropriate; distance from the conflicting traffic; direction of flight of the conflicting traffic; relative speed of the conflicting traffic or the type of aircraft and level if this is known…Relative movement and level should be described by using one of the following terms as applicable: closing, converging, parallel, same direction, opposite direction diverging, overtaking, crossing left to right, crossing right to left.'

The PA38 was in receipt of a BS and no TI was passed on the Squirrel; RT on the LARS frequency was continuous throughout the incident sequence. LARS reported that 'at no point did I consider there to be any point of confliction, or that the PA38 was likely to merge with any other contacts.' LARS has subsequently stated that whilst they recall making this assessment at some point during the incident sequence, they cannot recall when.

Between 1106:00 and 1106:25, APP was involved in liaison with unrelated Squirrel traffic. [The CPA occurred, in between sweeps, just after 1106:38 when the PA38 was marginally L of the Squirrel's 12 o'clock at a range of 0·1nm.]

Notwithstanding the non-sighting and effective non-sighting respectively by the PA38 and Squirrel crews and their responsibilities to 'see and avoid' in Class G airspace, the ATM aspects of this Airprox warrant further analysis. Whilst APP passed the initial TI to the Squirrel crew on the PA38, the description of the PA38's track at 1105:14 as "..*tracking east..",* did not accurately describe that track. Moreover, given the PA38's converging track, the description of its track relative to the Squirrel at the update at 1105:46 "..*3 miles crossing left-right*..", did not adequately describe that track either. Combined, these errors may have caused the Squirrel crew's incorrect mental picture. Moreover, although the Squirrel crew did not request updated TI or deconfliction advice, given that they had not called visual with the PA38 and that it continued to pose a definite hazard, the TI should have been updated after 1105:46. Given APP's moderate taskload and low complexity, it is difficult to comprehend how both the mentor and trainee mis-perceived the surveillance display and determined that the PA38 did not pose a continued 'definite hazard' to the Squirrel. Furthermore, whilst it could be argued that the vector onto N at 1104:12 introduced the risk of confliction between the PA38 and Squirrel, there is a hindsight bias inherent in this argument, given the separation that existed when the turn was issued combined with the dynamic nature of operating in Class G airspace. However, given the respective ATSs, whilst the instruction to descend to 2200ft was in-line with regulation, it did not reflect good practice as APP had received prior notification of the PA38 maintaining 2000ft QFE.

LARS was not required to pass TI to the PA38 crew under a BS and even if he had judged correctly that a confliction existed between the two ac that warranted a warning the RT frequency was too busy.

The remaining ATM related safety barrier in this occurrence would routinely be expected to have been provided by a Supervisor. Whilst the SUP states that he witnessed the occurrence, he is

unable to recall the event with any clarity and does not appear to have taken a part in the incident sequence. However, whilst direct liaison between APP and LARS may have been difficult given LARS' workload and RT loading, the absence of any liaison being conducted within the ACR suggests that there was a disconnect between the control positions, which would routinely have been filled by the Supervisor.

From an ATM perspective, the TI from APP to the Squirrel crew did not accurately or adequately describe the PA38's track. Given APP's moderate taskload and low task complexity, as the PA38 continued to pose a definite hazard a further update to the TI was warranted.

HQ AIR (TRG) comments that they concur with the BM SM assessment of the incident and agree that the Squirrel crew formed an incorrect mental air picture based on misleading TI. This TI was based on an erroneous assessment that the geometry of the situation was not a definite hazard. Without accurate height information on the PA38, it is not clear how this assessment was reached. As it was, the PA38 was spotted at a late stage and slightly low, so avoiding action was not required to prevent an actual collision. Had the crew opted for a DS, a more comfortable separation might have been achieved. However, with the information provided and the flight conditions prevailing it was entirely reasonable to be operating under a TS.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Members noted that the Squirrel pilot had received two transmissions of TI from APP, but did not see the PA38 until it was ¼nm away, moments before it passed slightly to starboard and beneath his helicopter. The BM SM report shows that the first TI was passed at 4nm and stated that the PA38 was, "..*tracking east no height information*." This TI was incomplete because it did not include the PA38's height of 2000ft QFE, which was known traffic to APP from the co-ordination effected by ZONE, when the PA38's squawk was pointed out to APP prior to the MATZ crossing. The TI was also inaccurate. It was evident to Members that the PA38 was not tracking E when this TI was given and it should also have been clear to the APP mentor that his trainee's TI was plainly wrong as the PA38 cleared from the Shawbury overhead heading SSE, which should have been corrected. It had been suggested by BM SM that the Squirrel safety pilot's mental air picture had been distorted by this inaccurate TI and pilot Members agreed that the pilot's perception would have been of traffic ahead clearing to the E and not flying towards his helicopter. This perception would have been reinforced by the subsequent call of, "..*3 miles crossing left-right*..", which inadequately described the geometry of the situation less than 1min before the CPA. Members agreed that inaccurate TI was part of the Cause. Moreover, as the PA38 continued to pose a hazard, notwithstanding that the Squirrel pilot had not asked for it, a further update of TI was warranted. It was not until the PA38 crossed ahead of the Squirrel into its 1 o'clock that the instructor safety pilot spotted it passing beneath his helicopter. This convinced the Board that the safety pilot in the LH seat had not seen the PA38 until after the conflict was subsiding; therefore, with the PF in the RH seat 'under the hood', this was effectively a non-sighting by the Squirrel instructor and another part of the Cause.

Moments after the first transmission of TI was given by APP the Squirrel pilot reported *"..now maintaining 2 thousand 2 hundred feet 1-0-1-4"* – on the QFE. Therefore, in following the trainee's instructions the Squirrel crew had descended to just 200ft above the PA38's height that had earlier been passed to APP. This should have raised a concern with the APP mentor and controller, and Members questioned the mentor's appreciation of the traffic situation. It was accepted that under the ATSs afforded the respective crews, neither APP controlling the Squirrel under the TS, nor ZONE providing the BS to the PA38 crew, were required to effect separation between these two ac. Nevertheless, Members were perplexed as to why the two controllers had not foreseen the possibility of a confliction or that these two ac contacts were likely to merge with each other. Whilst the radar

recording does not reflect the same radar picture displayed to the Shawbury APP and ZONE controllers, the potential for a conflict should have been readily apparent, contrary to both controllers' reports, as it is clear from the recorded radar data that these ac would fly into close quarters. This caused some Members to question why a warning had not been issued to the PA38 crew about the proximity of the Squirrel under the ZONE controller's duty of care. However, no liaison had been effected with ZONE to advise of the Squirrel's descent and, as the BM SM report had contended that the frequency was too busy and the controller's workload was 'high to medium', the Board accepted that ZONE might not have seen the helicopter's Mode C indications, thus a warning might not have been feasible in this instance. Operating under VFR, without the benefit of a TS, the PA38 crew were relying solely on their own lookout scan, but the PIC reports they did not see the Squirrel. It seemed that the PA38 pilot had requested a BS but a TS from ZONE, if available, might have forewarned the pilot of the approaching helicopter. Given that the PA38 crew had an equal responsibility to 'see and avoid' other traffic operating in Class G airspace and did not do so, the Members agreed this was the final part of the Cause. The Board concluded, therefore, that this Airprox had resulted from a non-sighting by the PA38 crew and, following inaccurate TI, effectively a non-sighting by the Squirrel instructor.

Turning to the inherent Risk, only one pilot here had sighted the other ac and that was after the conflict had passed. In the absence of any intervention by ATC, neither crew had seen the other ac in time to take positive steps to ensure appropriate separation was maintained. Indeed it was fortuitous that there was about 200ft of vertical separation as the PA38 passed less than 0·1nm ahead and then down Squirrel's starboard side. Although the Squirrel instructor's sighting at a range of ¼nm and his estimated vertical separation of 300ft would have been sufficient to avert an actual Risk of collision, the Members concluded unanimously that the safety of these two ac had been compromised.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the PA38 crew and, following inaccurate TI, effectively a non-sighting by the Squirrel instructor.

Degree of Risk: B.