

## AIRPROX REPORT No 2012110

Date/Time: 24 Jul 2012 1308Z

Position: 5351N 00112W (Church Fenton RW24RH cct - elev 29ft)

Airspace: Church Fenton MATZ/ATZ  
(Class: G)

Reporting Ac      Reported Ac

Type: Tucano T Mk1      Grob Tutor T Mk1

Operator: HQ Air (Trg)      HQ Air (Trg)

Alt/FL: 1500ft↓      1500ft  
QFE (1015hPa)      QFE (1015hPa)

Weather: VMC NK      VMC CLBC

Visibility: NK      30km

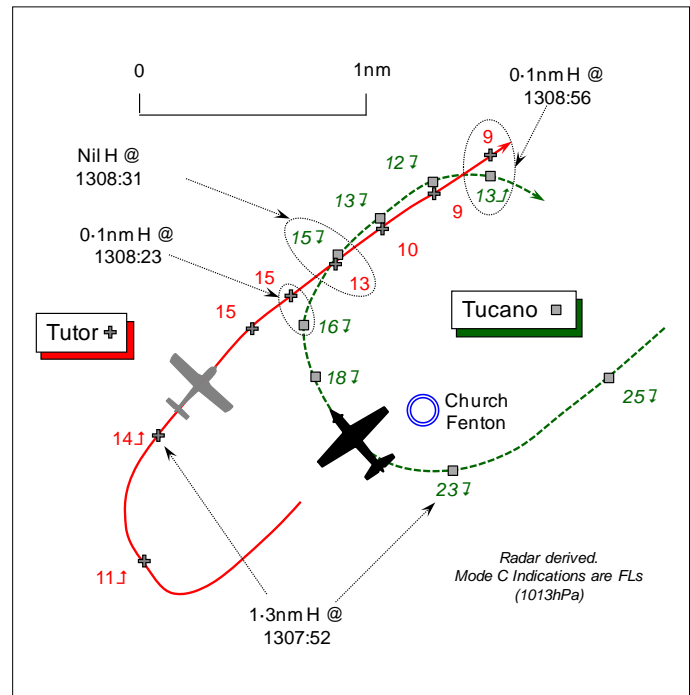
Reported Separation:

200ft V/Nil H      2-300ft V/30m H

Recorded Separation:

100ft Min V @ 0.1nm H

Nil H @ 200ft V



## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE TUCANO T Mk1 PILOT** reports he was flying solo in the cct to RW24RHC at Church Fenton and in communication with TOWER 'under MATZ control' on 234.1MHz. Setting up at 2500ft QFE for a PFL from HIGH KEY, he had tracked a Grob Tutor climbing away into the cct from a touch and go and called 'HIGH KEY' just as the Tutor pilot commenced his upwind turn. He judged that he had sufficient clearance from the Tutor since the equivalent position to HIGH KEY is the downwind position. When his Tucano was half-way between HIGH KEY and LOW KEY, he heard the Tutor pilot call downwind with intentions so he continued to lookout for the Tutor toward the 'dead' wing. TOWER told the Tutor pilot that there was one ahead – his Tucano - and asked the Tutor pilot if he was visual with his ac, stating his Tucano's position, but he did not hear the Tutor pilot reply or transmit after this point. Still feeling confident that they were sufficiently de-conflicted, he elected to continue with the PFL. Around the LOW KEY position he made a radio call asking if the Tutor pilot was visual or not, since he had still not heard any radio call and so started to level-off at 1500ft QFE. Heading 060° at 110kt, glancing at the TCAS display he noticed a contact indicating directly below at -200ft and rolled R to look below, where he saw the Tutor about 200ft below his ac. Immediately he initiated a 'go-around', applying full power and turning toward the deadside whilst transmitting to the Tutor pilot, warning him that his Tucano was directly above and he was going around. The Tutor pilot subsequently transmitted that he was heading out to Initial. He was 'relatively sure' that if he had continued his descent there would have been 'a fair chance' of collision or at least a close call. Nothing more was said by TOWER on the RT and he repositioned for a glide cct with no further incident.

A squawk of A4506 was selected with Mode C; TCAS I is fitted. The ac is coloured black/yellow and the HISLs were on.

**THE GROB TUTOR TMK1 PILOT**, a student, reports he was flying solo in the cct to RW24RHC at Church Fenton and in communication with TOWER under a 'procedural service', he thought, on 234.1MHz. During the cct consolidation phase of his briefed sortie a Tucano pilot called to join the cct through HIGH KEY. When he called downwind for a glide cct for a touch and go, TOWER

informed him that the Tucano was ahead between HIGH KEY and LOW KEY. He was visual with the Tucano and based on his limited experience, thinking his pattern would fit in behind it, he did not perceive the Tucano to be a threat at the time, so he continued with the pre-landing checks. During this process he neglected to update the position of the Tucano as he was pre-occupied with the checks. It was only as he closed the throttle, abeam the initial aiming point heading 060° at 80kt, that he once again became aware of the position of the Tucano and its close proximity to his Tutor. It was about this time that the Tucano pilot made an RT call trying to establish whether or not he was visual with the Tucano. He attempted to respond in the affirmative, but was unable to key the transmit button successfully in time. He then had to concentrate on descending in order to maintain sufficient vertical separation from the Tucano. As the Tucano went around above his Tutor, he transmitted his intention to descend and reposition to Initial. He estimated the minimum separation as 30m horizontally and 2-300ft vertically and assessed the Risk as 'low'.

He added that he thought his pattern would fit in with the Tucano and only realised that this would not be the case quite late. Additionally, this was the first time he had flown in the cct solo in the company of a Tucano. The Traffic Avoidance System (TAS) was switched off in accordance with the current SOP, although he was visual with the Tucano from the beginning of the downwind leg as a result of the TI given by ATC.

A squawk of A4506 was selected with Mode C/S. The ac is coloured white with a blue stripe; the HISLs were on

**THE CHURCH FENTON AERODROME CONTROLLER (ADC)** reports he was screening a trainee controller at the time of this incident. The Tucano pilot called HIGH KEY with intentions whilst the Tutor was crosswind. The Tutor pilot established himself on the downwind leg and called downwind with intentions. The trainee ADC replied correctly, 'one ahead between HIGH and LOW KEY, surface wind...'. Due to his experience at Church Fenton the controller knew that the Tucano PFL profile placed ac descending from HIGH KEY directly above the Control Tower, and that they would be unsighted for most of the Tucano's descent until around LOW KEY; also if the Tutor pilot maintained his course and speed, there might be a confliction. He moved as close to the VCR windows as his headset wire would allow him to see the downwind leg better; although it is a visual cct, he instructed the trainee controller to ask the Tutor pilot if he was visual with the Tucano ahead and this was done immediately. The Tutor pilot did not reply instantly and after a few seconds the Tucano pilot himself transmitted his height and called 'LOW KEY gear down'. At this point he was still not visual with the Tucano from the VCR. The trainee ADC transmitted 'clear touch and go' and he then saw the Tucano descending at LOW KEY. Once he acquired the Tucano he assessed the relative positions, courses and speeds of the two ac and was concerned that the Tutor had not seen the Tucano as he had maintained his course and speed, although from his perspective in the VCR, the Tucano looked like it would turn inside the Tutor on final and therefore there would be no collision. The Tucano pilot then transmitted asking if the Tutor pilot had seen his Tucano passing his position relative to the Tutor. There was another short pause before the Tutor pilot transmitted that he was going out to Initial. The Tutor pilot's instructor was in the VCR and he informed her of the situation in order that she could debrief the pilot after he had landed.

**BM SAFETY MANAGEMENT** reports that this Airprox occurred at Church Fenton, between a Tucano conducting a PFL and a Tutor conducting a glide cct, both in contact with Church Fenton TOWER.

TOWER was manned by a trainee and an experienced mentor who described their workload and task complexity as low.

The incident sequence commenced at 1307:29, as the Tucano pilot reported, "*HIGH KEY touch and go*", which was acknowledged by the trainee ADC. At this point, the Tucano was 2.4nm NE of the Tutor, tracking SW'ly, indicating 2500ft; the Tutor was in a R turn onto downwind, indicating 1200ft. The Tucano pilot had reported visual with the Tutor as he approached HIGH KEY; however, he had lost sight of the Tutor at some point after leaving HIGH KEY.

At 1307:47, the Tutor pilot reported, “*downwind glide, touch and go*” and was advised by the ADC of, “*one ahead [the Tucano] between high and low key, surface wind 3-1-0, 0-7.*” At this point, the Tucano was 1.7nm ENE of the Tutor, tracking SW’ly, indicating 2500ft; the Tutor was tracking NE’ly, indicating 1200ft. The Tucano pilot reported being aware of the Tutor pilot’s downwind call and ‘continued to lookout for him toward the ‘dead’ wing.

The mentor ADC reported that he ‘knew that the Tucano PFL profile [would] put him descending from HIGH KEY directly above the Tower, that we [the ADC mentor and his trainee] would be unsighted for most of his descent until around low key, and that if the Tutor carried on his course and speed there might be a confliction’. As a result the mentor instructed the trainee to ask the Tutor pilot whether he was visual with the Tucano; the trainee did this at 1308:23, but the Tutor pilot did not respond.

[UKAB Note (1): At this point, the radar recording shows the Tucano was 0.1nm SE of the Tutor, in a right-hand turn passing through N, descending through 1600ft Mode C (1013hPa); the Tutor is tracking NE’ly, indicating 1500ft Mode C (1013hPa). At 1308:31, the Tucano contact indicating 1500ft merged with that of the Tutor tracking NE’ly indicating 1300ft. The ac remain within 0.1nm of each other, on similar tracks, within 300ft of each other until the contacts separate after 1308:56.]

Based upon analysis of the individual pilots’ reports, it was not until just before the Tucano pilot broke the conflict at 1308:56, that both the Tucano and Tutor pilots became fully aware of the Tutor’s proximity and were not visual with it prior to the initial ‘merge’ at 1308:31.

At 1308:35, the Tucano pilot reported, “*LOW KEY gear down*” and was, “*cleared touch and go*” by the trainee ADC. At 1308:43, the Tucano pilot readback the clearance and asked, “*is he [the Tutor] visual with me?*” and then immediately stated, “*I’m right on top of you.*” The Tutor pilot replied, “[Tutor C/S] *descending downwind to [2-sec pause] initial.*”

Subsequent to completing his report, the ADC mentor has confirmed that by ‘moving as close to the window as his headset wire would allow’ they were able to visually acquire the Tutor for much of the incident sequence; however, they did not acquire the Tucano until it reached LOW KEY. Moreover, the ADC mentor reported and confirmed in a subsequent conversation that immediately after they had visually acquired the Tucano, the latter’s pilot questioned whether the Tutor pilot was visual with his ac.

The unit have completed a detailed investigation into this incident; however, this investigation was conducted without a radar replay. Consequently, the investigation concluded that the CPA occurred immediately prior to the Tucano pilot breaking the conflict at 1308:56. The BM SM investigation has determined that the CPA was earlier and the conflict prolonged, thus the severity of the incident was greater than it initially appeared.

In hindsight, the ADC mentor has acknowledged that they could have pursued a reply from the Tutor pilot to the question at 1308:23, whether he was visual with the Tucano. However, they were conscious of allowing the Tutor pilot time to reply and that both of the ac’s pilots were trainees and should not, ideally, have their checks interrupted. Moreover, the CPA occurred at 1308:31, meaning that any follow-up action by the ADC would not have prevented the Airprox, merely alerted both pilots to their potential proximity and, arguably, shorten the duration of the conflict. Finally, both crews were operating within a visual cct where it was their responsibility to ‘see and avoid’, to use the available RT calls to enhance their SA and to integrate themselves according to the order of recovery correctly provided by the ADC. On that basis, given the timescales involved and the limitations on the ADC’s lookout imposed by the construction of the Control Tower and the length of their headset lead, it is inappropriate to suggest that the ADC was in a position to affect the outcome of this incident.

**THE TUCANO T MK1 PILOT’S UNIT** comments that this was well handled by an inexperienced student. There are a number of points worth highlighting: the student had a strong understanding of the sequencing that should exist with regard to HIGH KEY and downwind calls, which is worth noting

by QFIs teaching these elements of the course; the student had the confidence and captaincy to act when events did not seem to be correct; mixed traffic patterns can lead to more confliction than would otherwise be the case; and strong SA was provided by TCAS being selected on in the visual cct and ac squawking in the visual cct. We have had many discussions on the merit of squawking/selecting TCAS on in the visual circuit and this occurrence vindicates such a policy. It is perceived that this policy is not RAF wide across fleets or Stations, which is possibly worth wider consideration.

**HQ AIR (TRG)** comments that this incident was well handled by the unit and triggered a Safety Investigation, which resulted in several recommendations. The Tutor student appeared to be aware of the confliction following completion of his downwind checks and was faced with an uncomfortable decision on how to avoid a collision. A hard turn away might have been the best option but this would have placed him unsighted on the Tucano then descending and overtaking him from his high 4 o'clock. Clearly an earlier decision to continue when the Tucano called 'High Key' created the conflict and an orbit or widen to go around would have been more appropriate; further guidance on such situations will now be provided to students. The consideration of CWS settings in the circuit is also under review and its continued use in the circuit should be considered by all users of such equipment. However, the lack of TAS warning to the Tutor was not critical in this instance as the pilot appears to have been visual and to be able to take late but effective avoiding action; by contrast, the TCAS warning appears to have highlighted to the Tucano pilot that his presumption that the Tutor student had taken satisfactory steps to deconflict were incorrect. His questioning of the Tutor pilot's SA was commendable.

## **PART B: SUMMARY OF THE BOARD'S DISCUSSIONS**

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

Although the mentor ADC had suspected that a conflict might materialize between the two ac and was looking for the Tucano, it was unfortunate that he had not acted on his instincts to press his trainee for a reply from the Tutor pilot to confirm that he had the Tucano in sight. The BM SM report had highlighted that although this might have alerted the Tutor pilot to look for the Tucano, as the CPA occurred only moments later it would have had little impact on the outcome. The Board was concerned that the ergonomics of the Control Tower, coupled with the length of their headset cables had impeded the controllers' ability to look-out of the VCR; the HQ Air (Trg) Member briefed the Board that the use of a wireless headset is being investigated, which would allow controllers greater freedom. However, a controller Member who is familiar with the Control Tower layout at Church Fenton suggested that the Duty Instructor's (DI) position in the VCR is best placed to observe the cct now that the cct direction is RH on RW24 and the Board was briefed that the DI was in the Tower for the Tutor student's solo ccts. As the cct relied on visual acquisition and separation, it was the responsibility of both the Tucano and Tutor student pilots to sequence themselves appropriately in the pattern. In the Board's view, the Tutor student was probably operating at the limit of his ability for that stage of training, which led some Members to suggest that the DI could have been more circumspect and prompted his student what to do when the Tucano started the PFL.

The Tucano pilot was plainly aware of the Tutor in the cct when he passed HIGH KEY, had seen it climbing out from the 'touch and go' and perceived that he would be ahead of it in the pattern. He might also have expected the Tutor pilot to react to the 'HIGH KEY' call by extending upwind. In fact the Tutor pilot had already extended upwind from the point at which he would normally turn cross wind (500ft) in order to climb for a glide circuit (1500ft downwind) but this extension was insufficient to establish separation from the Tucano. As it was, the Tucano was between HIGH and LOW KEY when the Tutor pilot called downwind for his glide cct and a pilot Member perceived that this downwind call would have come earlier than the Tucano pilot expected and was the first clue that the Tutor was close by in both range and height. Nevertheless, TOWER correctly gave the Tucano priority in the cct and, in response to the Tutor pilot's downwind call, told the Tutor pilot that the

Tucano was ahead of him in the landing sequence. Up until this call, the Tucano pilot would have been unaware that the Tutor pilot was practising the higher 'glide' cct, flown at 1500ft. This eroded any anticipated vertical separation against the Tucano still further as the latter descended toward LOW KEY, directly above the Tutor, which was not spotted on the Tucano pilot's TCAS display 200ft directly below him until after his query on the RT he reports. It seemed that the Tucano pilot's relative inexperience had allowed him to press on, unsighted on the Tutor but knowing he had priority in the cct, possibly discounting it as a factor, unaware until a late stage that separation was not assured against the Tutor below him. Critically, the Tutor student had also been unsighted for a period downwind and it was not until he was abeam his touchdown aiming point on the RW he reports that he re-acquired the Tucano, descending above him. The Board recognised that the student would have been confronted with a difficult situation with virtually no experience to fall back on, but he still had to 'give way' and avoid the Tucano as best he could. An orbit downwind was an option – albeit rather extreme; a Tutor pilot Member suggested another way would have been to have widened his cct somewhat, thereby affording the Tucano priority in the cct and avoiding an unfamiliar final turn for the inexperienced Tutor pilot. However, this could only have been accomplished if the Tutor student had maintained his lookout during his checks and remained aware of the Tucano as it descended towards him; given the cct priorities, this led some Members to conclude that the Cause was that downwind the Tutor pilot lost sight of the Tucano. It was evident from the recorded radar data that the conflict had persisted for the majority of the downwind leg and the two ac were within 0.1nm, just before the Tucano steadied abeam the A/D at 1308:23; this was also just the point the mentor ADC instructed his trainee to clarify if the Tutor pilot was visual with the Tucano a mere 100ft vertically above him the radar shows. A further 20sec elapsed before the Tucano pilot queried whether the Tutor student was visual with his ac and about the point that the radar recording shows the Tucano turning R, which is when its pilot probably appreciated what was happening. Members suggested that the Tutor pilot's inability to react and answer the RT showed how he might have been at the limit of his capacity. Moreover, given the Tutor pilot's stage of training, it was not clear if he had been taught how to sequence in the cct with a faster ac and pilot Members opined that the DI should have been more proactive here. The Board concluded therefore that this Airprox resulted because the Tutor pilot did not give way to the Tucano ahead. Members were reassured to learn from the HQ Air (Trg) comments that additional guidance on sequencing in the cct will be forthcoming for tyro students as a result of this Airprox.

Turning to the inherent Risk, the Tutor pilot's chosen option to resolve the situation was to descend below the Tucano whilst clearing the cct back to initial. It was evident from the recorded radar data that the Tutor was descending during the 'merge' downwind, albeit that the reducing Mode C indications could also be a reflection of the glide cct. However, the Tutor pilot reports he descended to maintain sufficient vertical separation from the Tucano, albeit that his recollection did not correlate entirely with the radar and RT recordings. Nevertheless, it seems he was aware of the problem and was trying to resolve it. However at these close quarters, given both pilots' relative inexperience, the Board agreed that the safety of the ac involved had certainly been compromised in the circumstances conscientiously reported here.

### **PART C: ASSESSMENT OF CAUSE AND RISK**

Cause: The Tutor pilot did not give way to the Tucano ahead.

Degree of Risk: B.