

## AIRPROX REPORT No 2012130

Date/Time: 14 Aug 2012 1445Z

Position: 5317N 00057W (0.5nm FIN  
APP RW21 Gamston - elev  
87ft)

Airspace: ATZ (Class: G)

Reporting Ac Reported Ac

Type: Tutor T Mk1 BE35

Operator: HQ Air (Trg) Civ Pte

Alt/FL: 700ft↓ 500ft↓  
QFE (1006hPa) QFE

Weather: VMC CLOC VMC CLOC

Visibility: 40km >10km

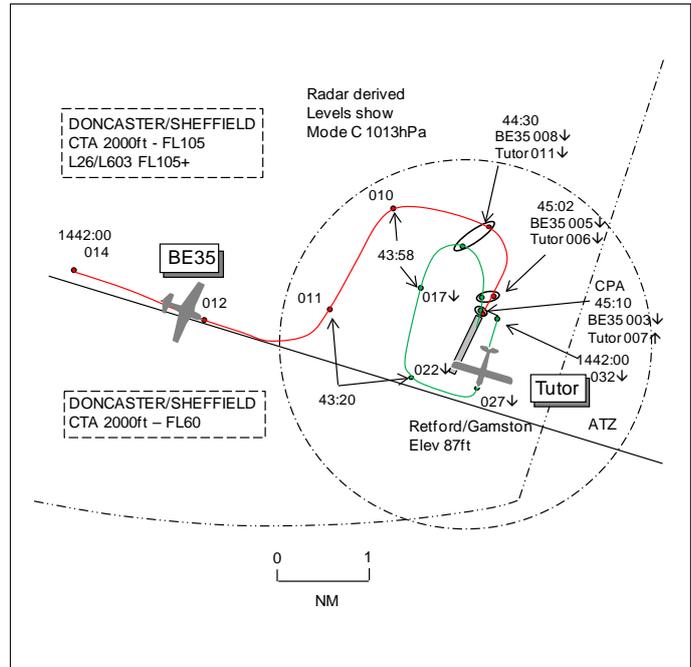
Reported Separation:

300ft V 150ft V/300m H

Recorded Separation:

100ft V/0.1nm H

Or 400ft V/Nil H



### PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE TUTOR PILOT** reports flying a dual local training sortie from Cranwell. The visibility was 40km in VMC and the ac was coloured white. After completing a missed approach from RW20 at Doncaster they had maintained a TS for a visual departure via GAM. The student was given a simulated engine malfunction, which he dealt with appropriately, and a PD to Retford/Gamston was arranged for a PFL. Doncaster asked them to maintain their transponder code to enable a return to service after the PFL. Gamston Radio gave the airfield details and traffic was heard leaving the frequency. The Tutor was positioned for 'High Key' RW21 RH cct at 75kt at about 3200ft on QFE 1006hPa. The RH cct suited the student's view of the procedure and as no IFR hood was in use the instructors view to the R was less obstructed than under normal I/F training. When the student called "High Key for low approach RW21" there was no cct traffic. The student called, "Low Key" at 1500ft, abeam the initial aiming point downwind and another ac's pilot was heard calling to join downwind. At 1300ft the student began the final turn and called, "(Tutor c/s) final". At 900ft they heard the previously mentioned traffic call "(BE35 c/s) R base" and this traffic appeared in their 7 o'clock low on a similar heading, just to the NW of Retford town and TAS sounded a proximity alert 'Traffic' with correct symbology; the audio warning was cancelled. Gamston Radio asked the BE35 pilot whether he was visual with the Tutor on final approach but there was no response initially so the Tutor pilot transmitted his position relative to the traffic, "Tutor in your 3 o'clock high". The Tutor was approximately 700ft QFE within 30° of the RW C/L and TAS sounded once more. The BE35 pilot transmitted, "Final I am landing RW21" and by now the Tutor was about 10° to the R of the RW C/L with the traffic in sight, just behind the port wing but about to go out of sight 300ft below. They initiated a go-around from their glide-approach, keeping to the R of the RW C/L (non-standard) to increase separation. He assessed the risk as medium.

**THE BE35 PILOT** reports inbound to Gamston from Netherthorpe, VFR and in communication with Gamston Radio on 130.475MHz, squawking 7000 with Modes S and C; TCAS was fitted. The Wx and flight conditions were good and the ac was coloured white/blue with strobes and anti-collision lights switched on. On departing the Netherthorpe cct for the short 9nm flight he established a SE'ly heading, remaining at 1000ft amsl to remain below Doncaster airspace. He configured the ac for a slow cruise as the flight was short and he was in no particular hurry. At about 6nm from Gamston he selected the Gamston frequency. He heard nothing on frequency so made his first call advising c/s,

inbound from Netherthorpe and requesting cct and landing information. He was advised the RW in use was 21 with a RH cct and given a QFE, which he selected. On receipt of this information he called again enquiring if there was cct traffic; the reply was "affirmative". He was visual with the airfield and observed a light ac on the RW21 threshold starting its take-off run. A few seconds after the "affirmative" response he heard an ac's pilot transmit, "(Tutor c/s) High Key for PFL" to which Gamston Radio acknowledged "Roger". Although he deduced from this transmission that an RAF training ac was on frequency, he had no idea what "High Key" meant; neither did he assume that the PFL was intended on the airfield. In 42yr of flying he had never heard this expression before. He positioned onto R base for RW21 and at 700ft and 90kt, shortly before turning final, he heard the Tutor pilot call, "(Tutor c/s) Low Key". From a subsequent discussion with the military instructor he understood the Tutor pilot recalled making a "final" call but he did not share this recollection. It was possible, though in his mind by no means certain, that the Tutor pilot called, "(Tutor c/s) Low Key to finals". He still had no idea that the military ac was in the cct with his ac. He called, "(BE35 c/s) R base turning finals" and at 700ft he turned on finals for RW21. He was fully configured for landing, gear down with first stage of flap at 90kt. Shortly after this turn Gamston Radio asked if he was visual with the Tutor ac to his R. He observed the Tutor as it appeared to be completing a RH turn, about 150ft higher and 300m away to his R. After landing he heard the Tutor pilot request his c/s and Gamston Radio advised that he had landed. After a second request, his c/s was given to the Tutor pilot. He assessed the risk as low. He commented that High Key and Low Key are not familiar civilian terminology. The Tutor instructor advised him that he was also trained as a civilian instructor and that these expressions are known and widely understood. He disagreed, having never heard them before and other experienced civil pilots also had no knowledge of these expressions. He believed that all military pilots should not use non-civilian RT terminology when operating at or near a civil airfield. He now understands the calls refer to circling PFL technique; however, civil pilots should be made aware of what is involved (non-standard cct pattern) if this procedure is flown at civil aerodromes. It might be prudent to ensure the cct is completely clear before commencing. His ignorance of the terminology/procedure caused him to assume that whilst a PFL by a military ac on frequency was underway, the Tutor pilot would maintain a good lookout and not compromise other traffic in the cct. He had no clear recollection of the Tutor pilot's "finals" call and had he heard such a call he would have reacted differently. The "Low Key" or possibly "Low Key to finals" call preceded his call "R base turning final"; he was not aware that a flight calling finals first had priority to land - only the lower of the ac closest to the threshold has priority. He had no idea that the Tutor intended to position on a circling finals approach to land on the active RW; it could have been positioning into a field off airfield, consistent with keeping clear of the active cct. Although his ac has been TCAS equipped for 5yr, he is always suspicious as to its accuracy when in the cct as indications can be erroneous and misleading; on this occasion he did not recall a TCAS alert.

**ATSI** reports that the Airprox occurred at 1445:08 UTC, at Retford/Gamston aerodrome, on short final for RW21, within Class G airspace and inside the Gamston ATZ. The Gamston ATZ comprises a circle radius 2nm, centred on the midpoint of RW03/21 and extending to a height of 2000ft above aerodrome level (elevation 87ft). Gamston Aerodrome is situated to the SE corner of the Doncaster Class D CAS, below the Doncaster CTA which has a base of 2000ft. Gamston is promulgated as providing an Air Ground radio (A/G) within the notified hours of operation. Gamston were using RW21 RH cct. There are no specific flight procedures for ac joining the cct.

The Tutor flight was operating VFR on a training detail and was conducting a PD to Gamston, with a simulated engine malfunction. The Tutor flight was in communication with Gamston Radio (A/G). The BE35 was operating VFR on a flight from Netherthorpe to Gamston at an altitude of 1000ft and was also in communication with Gamston Radio (A/G).

CAA ATSI had access to area radar recording, written reports from both pilots.

The Gamston QFE was 1006hPa and the Wx for Doncaster is provided:  
METAR EGNJ 141420Z 18006KT 160V220 9999 SCT043 24/14 Q1011=

The Tutor flight had been in receipt of a RCS from Doncaster Radar and, after the completion of an ILS and missed approach to Doncaster RW20, was departing to the S. As part of the training detail

the Tutor pilot simulated an engine malfunction and requested a PFL at Gamston. Doncaster Radar transferred the flight to Gamston Radio but requested that the Tutor retain the Doncaster squawk 6174 in preparation for the Tutor's climb out and departure from Gamston.

At 1441:03 radar shows the Tutor inside the Class D airspace, at a position 1.8nm N of Gamston at FL033 (converts to a height of 3100ft, using QFE 1006hPa with 1hPa equal to 27ft rounded to the nearest 50ft). The BE35 is 6.7nm W of Gamston at FL013 (height 1100ft), squawking 7000.

The Tutor pilot reported that he had contacted Gamston Radio and was passed the airfield details, with RW21 RH and QFE 1006hPa. The Tutor pilot reported hearing another flight leaving the Gamston frequency and the Tutor then positioned for RW21 RH, for 'High Key' at approximately 3200ft. (High Key is military specific phraseology).

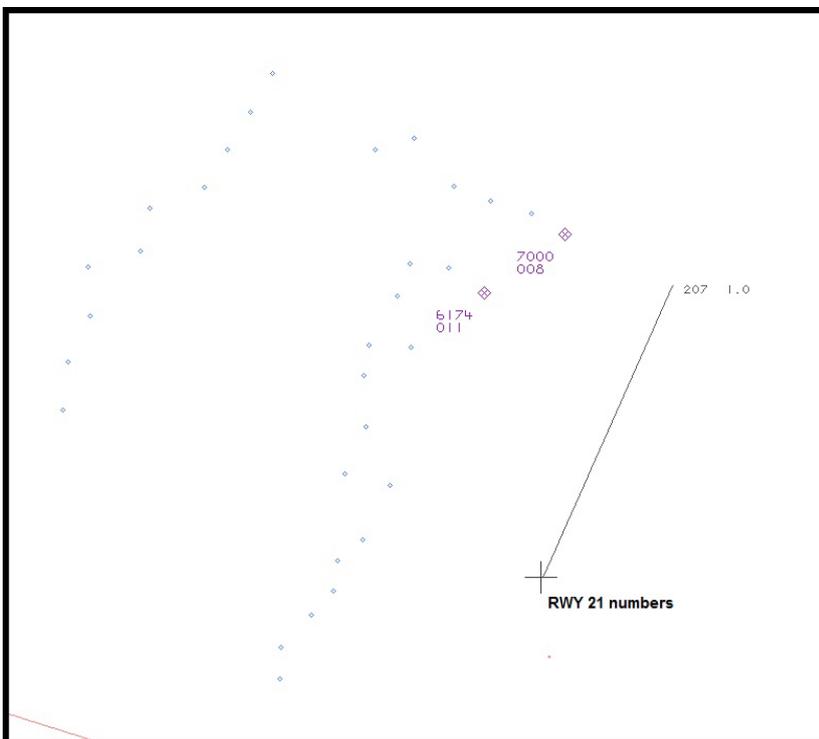
The BE35 pilot reported that on initial contact with Gamston he was advised RW21 (RH) and was passed the QFE and was advised that there was cct traffic. The BE35 pilot indicated that he had observed a light ac starting its take-off run on RW21 and shortly afterwards heard the Tutor pilot reporting "High Key for PFL".

The Tutor pilot indicated that when he called "High Key" (O/H) for a low approach to RW21 RH, the cct was clear. At 1442:00, radar shows the Tutor approaching the Gamston O/H on a S'ly heading and commencing a descent. The BE35 was 4.3nm WNW of Gamston at FL014 (height 1200ft).

The BE35 pilot's written report indicated that he was unfamiliar with the term 'High Key' and wasn't sure if the PFL was intended O/H, or away from the airfield. The BE35 continued towards a R base for RW21.

At 1443:20, the Tutor is shown to be crosswind passing FL022 (height 2000ft) with the BE35 positioned 1.1nm NW of the Tutor and joining downwind at FL011 (height 900ft).

The Tutor pilot indicated that at 1500ft, when at 'Low Key' (downwind), another ac (BE35) was heard calling on frequency to join downwind. (Low Key is military specific phraseology). At 1443:58, radar shows the 2 ac downwind, with the Tutor on a short cct pattern and the BE35 on a normal cct 1nm NW of the Tutor and just commencing a R turn onto base leg. The 2 ac continued to base leg and at 1444:32 are shown in radar print 1 below. The GS of the BE35 was 106kt and the Tutor 80kt.



The Tutor pilot's written report indicated that Gamston Radio had asked the BE35 pilot if he was visual with the Tutor on final approach, with no initial response. The Tutor pilot indicated that he transmitted, '*Tutor in your 3 o'clock high*'. The Tutor pilot indicated that the BE35 was about to go out of sight 300ft below his port wing.

[UKAB Note (1): The radar recording at 1445:02 shows the 2 ac on short final, the Tutor at FL006 and the BE35 100ft lower at FL005, lateral separation 0.1nm. The CPA occurs on the next sweep 8sec later, the radar returns merge with the Tutor now climbing through FL007 and the BE35 descending through FL003. On the next sweep the BE35 has disappeared from radar with the Tutor continuing its climb on a SSW'ly heading.]

The 2 ac were in communication with Gamston Radio (A/G) and were not in receipt of an ATS. The Airprox occurred inside the Gamston ATZ within Class G airspace and pilots are ultimately responsible for collision avoidance using the 'see and avoid' principle.

With the cct clear, the Tutor pilot commenced a PFL approach from the O/H. At this point the BE35 was 4.1nm W of the airfield. The RoA Rule 12(a) states:

‘..that the commander shall... conform to the pattern of traffic formed by other aircraft intending to land at that aerodrome or keep clear of the airspace in which the pattern is formed...’

The Tutor was already established crosswind in the cct, albeit on a short pattern glide approach, when the BE35 pilot reported downwind. However the BE35 pilot was confused by the use of the military specific phraseology, 'High Key' and 'Low Key'. The Foreword to CAA CAP413, paragraph 1.2.2 and 1.2.3, state:

‘Chapter 10 of this Manual details Military Specific Phraseology for specific use by military ATCOs and military aircrew. The RTF described in Chapter 10 is complementary to NATO STANAG 3817. It is also complementary to the remainder of CAP 413, as it either differs from civil phraseology or there is no equivalent civil phraseology, e.g. in the case of arrestor system procedures.’

[UKAB Note (2): Chapter 10 Para 3.10 Flameout/Engine Failure – Aerodrome Phraseology does show RT exchanges for High and Low Key but there is no explanation/diagram of cct position associated with the phraseology.]

As the 2 ac continued in the cct, neither of the 2 pilots saw each others ac until they had established on final approach.

The Tutor was descending from inside CAS from 3000ft may have been above the normal scan of the BE35 looking for traffic in the standard cct pattern which lies below CAS. Equally the BE35 was always below the Tutor and may have been below the visible scan of the Tutor pilot.

The Airprox occurred when the BE35 flight joined the visual cct at Gamston and flew into close proximity with the Tutor ac. The PFL procedure using military specific phraseology caused a misunderstanding and was considered to be a contributory factor.

**HQ AIR (TRG)** comments that the Tutor pilot resolved the confliction in a safe and professional manner. It is good to note the benefit of TAS even in a visual cct pattern in alerting crews to potential conflicts. However, it is disappointing that the BE35 pilot distrusted his TCAS to such a degree. It is also disappointing that having visually acquired the Tutor inside him in the circuit he did not ask his intentions, or respond to the Tutor pilot's call, and did not realise that he was cutting in below an ac ahead of him in the pattern. Whilst the BE35 pilot did not recognise the military terminology within CAP413, one might expect that this would have prompted a question as to its meaning. An amendment to the CAP to illustrate the 'High Key' (O/H) and 'Low Key' (abeam the threshold) positions, is of little use if civilian pilots are not obliged to read the whole document. Military pilots

should be aware of the very limited functions provided by a 'Radio' c/s in terms of the service being provided.

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

Information available included reports from the pilots of both ac, radar video recordings and reports from the appropriate ATC and operating authorities.

It was clear that the BE35 pilot was unfamiliar with the military RT phraseology used by the Tutor pilot. Civil controller and pilot Members agreed that civil pilots operating at civil aerodromes would normally not be exposed to military RT and hence would not assimilate the meaning of the "High Key" and "Low Key" phrases. When the Tutor pilot called "High Key" at 3000ft the ac would have been above approaching BE35 pilot's visual scan; his focus would have been looking for other traffic joining either through an O/H join or directly through a crosswind join at cct height. The BE35 pilot joined through the downwind position on a normal cct whereas the Tutor was tight-in to the RW on the dead-side and high on its PFL cct pattern. By joining the cct downwind, one Member questioned whether the BE35 pilot had to conform to the pattern established by the Tutor or vice-versa, or whether neither ac had established a cct pattern (priority) ahead of the other. On radar, it seems the BE35 was in the downwind position as the Tutor was high crosswind and turning high downwind. Later, as the Tutor pilot called "Low Key" the BE35 was late downwind and then turning R base leg before both ac turned towards final approach. Members wondered why the BE35 pilot did not question/query the Tutor pilot on the RT at the time in an attempt to understand the flight profile being flown. With only A/G in operation, the onus was on both pilots to integrate themselves safely into the cct. Had there been full ATC with positive control of the visual cct, Members were sure that this incident would not have occurred. Military pilot Members opined that when the Tutor pilot called "High Key" there was nothing else in the cct and if it had been a military aerodrome, the pilot would have expected priority for the PFL procedure. Civil pilot Members opined that when the equivalent civil PFL was carried out, the pilot conducting the PFL would give way to all other traffic as the PFL pattern did not conform to that flown by normal cct traffic. The CAA Strategy and Policy Advisor informed Members that there was no phraseology for civil PFLs within CAP413 and this anomaly would be highlighted to the CAA Phraseology Working Group. Both pilots used different phraseology for position reporting into and around the visual cct. Members agreed that the Tutor pilot's use of military RT and procedures at a civil airfield had denied the BE35 pilot the SA normally afforded through RT exchanges to assimilate and visually acquire other traffic and this had caused the Airprox.

Turning to risk, the BE35 pilot had not seen the Tutor before being given the 'heads-up' by the A/G operator whilst establishing on final approach. From his perspective, at this late stage, he had priority since his ac was lower than the Tutor, which was perceived to be forcing its way in ahead. The Tutor pilot did not see the BE35 downwind and crossing ahead as he descended between High and Low Key and was alerted to its presence by his TAS, which enabled him to see it behind and to his L below. After A/G's transmission to the BE35 pilot, the Tutor pilot had reinforced his relative position with another broadcast as the 2 ac both turned onto final approach. The disparate speeds flown by both ac had led to the BE35 rapidly catching-up the Tutor as they converged which led to the Tutor pilot executing a go-around as the BE35 was about to disappear under his port wing. Although this had had the potential for becoming a very serious incident, the actions taken by the Tutor pilot were enough to allow the Board to conclude that any risk of collision had been effectively removed.

Members noted that the BE35 pilot was suspicious of the accuracy of his TCAS equipment. Although this suspicion is justified with regards to the azimuth (relative bearing) element, which is known for its inaccuracy particularly a short range, this should not translate across to the vertical separation element. TCAS collision avoidance algorithms are designed to provide information and guidance based on Mode C reporting to generate TAs and subsequent RAs and is accurate.

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

Cause: A conflict caused by the use of military RT and procedures at a civilian airfield.

Degree of Risk: C.