

## **AIRPROX REPORT No 2013023**

**Date/Time:** 25 Apr 2013 1335Z

**Position:** 5113N 00136W

(6nm Final App to Boscombe Down RW23)

**Airspace:** Boscombe Down CMATZ

(**Class:** G)

**Reporting Ac**      **Reported Ac**

**Type:** Squirrel HT2      BE58

**Operator:** HQ AAC      Civ Pte

**Alt/FL:** 2000ft      ↓2000ft

QFE (1006hPa)      QFE (1006hPa)

**Weather:** VMC CBC      VMC NR

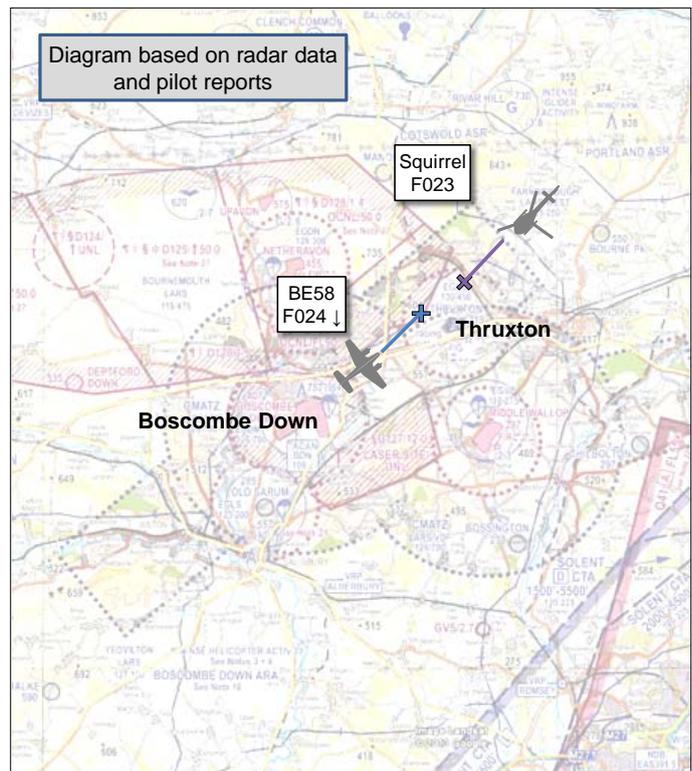
**Visibility:** 8km      10km

**Reported Separation:**

150ft V/100m H      NR

**Recorded Separation:**

200ft V/0.1nm H



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

**THE SQUIRREL PILOT** reports heading 230° at 95kts in a black and yellow helicopter with white upper and lower strobe lights and navigation lights turned on at 1500ft QFE, he thought. The crew consisted of an instructor and a student who had been tasked with carrying out an IF GH sortie including a series of instrument approaches. The instructor reports that they were in VMC with SCT cloud at around 2500ft and around 8km visibility below cloud; the student was wearing a visor to simulate IMC. Following a QFE check from PAR the instructor looked in to the cockpit to confirm the setting and then resumed his lookout. The PAR controller then called 'pop-up traffic' and the instructor simultaneously became visual with the BE58 in his 12-1230 o'clock position at a range of 100-150m and around 150ft below his ac and climbing, he thought. The Squirrel crew turned L 20° before resuming their approach and the instructor perceived that without their turn the two ac would have been 'perilously close' to each other.

He perceived the severity of the incident as 'High'.

**THE BE58 PILOT** reports flying the blue and gold ac, in VMC with greater than 10km visibility, from Henstridge to Thruxton. He was flying VFR at 2500ft on Boscombe QFE, heading 060° at 170 kt, squawking mode 3/A 2650 with modes C and S selected and his landing light on. Under a BS from Boscombe Zone, he received a MATZ crossing clearance and, as instructed, reported OH Boscombe. Around 3nm W of Thruxton at 2500ft he reported visual with Thruxton and Zone immediately instructed him to squawk 3/A 7000 and free-call Thruxton. Having completed the squawk change and established contact with Thruxton, he was positioning to join RH Downwind for RW25 when he saw the Squirrel around 1.5nm away on a reciprocal heading slightly below him. He stopped his descent at about 2000ft and turned slightly L (on to N he thought) in order to keep the Squirrel in sight. Once the helicopter had passed his ac he continued his descent and rejoined the Thruxton visual cct.

UKAB Note 1: The METAR for Boscombe Down at 1250Z was:

METAR EGDM 251250Z 23009KT 9999 BKN013 15/11 Q1020 GRN BECMG SCT015 WHT=

**THE PAR CONTROLLER** reports that he was monitoring the Squirrel on the azimuth (AZ) and glidepath (GP) screens of the PAR display and informed the crew that they were approaching their descent point. He had observed a contact below the Squirrel, possibly in the Thruxton visual cct, and was dividing his attention between that traffic and the Squirrel's descent point when he observed 'pop up traffic' descending on to the GP screen in the Squirrel's 12 o'clock. PAR passed TI and the Squirrel crew reported visual with it and the controller reports that the conflicting traffic continued to descend through 2000ft.

He perceived the severity of the occurrence as 'Medium'.

**THE BOSCOMBE SUPERVISOR** reports that his attention was caught as he noticed PAR passing TI to the Squirrel; when the Squirrel crew confirmed they were visual with the conflicting traffic SUP turned his attention to the APP screen and assessed that the ac was the BE58 descending in to Thruxton. He confirmed that APP had approved the MATZ crossing but it had been released without the approval of the APP controller.

**BM SAFETY POLICY AND ASSURANCE** reports that the Squirrel was conducting an IFR instructional sortie under a TS and was receiving a GCA from Boscombe Talkdown utilising the PAR. The BE58 was operating VFR inbound to Thruxton and was in receipt of a BS from Boscombe Zone up until 1min and 8 secs prior to the incident.

Talkdown reported that his workload was low with the Squirrel in the early phase of the GCA. Zone described his workload as moderate and did not make an assessment of the task complexity. At the time of the incident, Zone was providing ATS to 2 ac, including the BE58.

The incident sequence commenced at 1329:29 as Zone approved the BE58's MATZ penetration at, "height 2500 feet, Q-F-E 1-0-0-6" and instructed them to, "report overhead Boscombe" which was readback by the BE58 pilot. The assigned height of 2500ft was intended to deconflict the BE58 from the Squirrel, which was operating within the RTC at 2000ft Boscombe Down QFE. At 1332:13, the BE58 pilot reported, "in the overhead" which was acknowledged by Zone. Figure 1 depicts the incident geometry at this point with 11.7nm lateral separation between the BE58 and Squirrel (squawking Mode 3/A of 2650 and 2617 respectively). The 7 hPa difference between the Boscombe QFE and the SAS equates to approximately 210ft; thus the BE58 and Squirrel's SSR Mode C information depicted in Figure 1 indicates that they were within the verification and level occupancy limits for their respective heights.

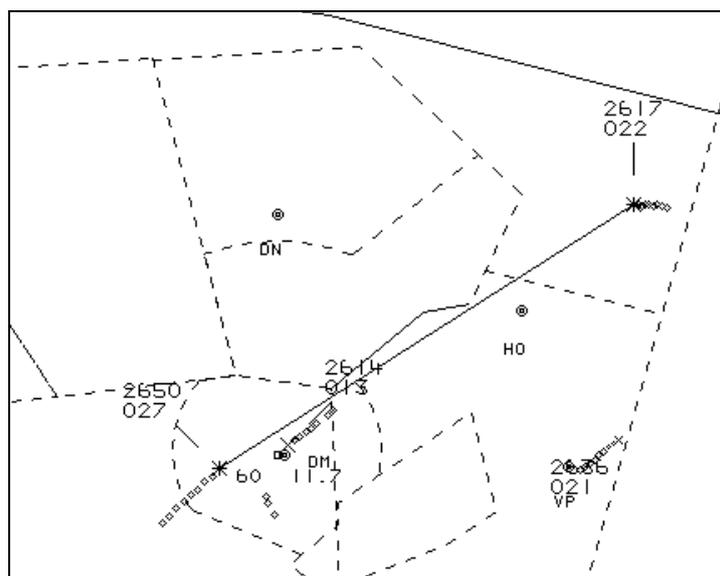


Figure 1: Incident Geometry at 1332:13.

Immediately after the BE58 pilot reported in the overhead, between 1332:17 and 1333:01, Zone was involved in an R/T exchange with a freecalling ac undertaking an air test. There was then a further, shorter, exchange of R/T with this ac between 1333:21 and 1333:32. Concurrently, at 1332:41, the Squirrel established R/T contact with Talkdown advising that they had Boscombe QFE, "1-0-0-6 set" which was acknowledged by Talkdown. Between 1333:55 and 1334:08 there were some minor communications issues; however, these were fully resolved by 1334:08 with the Squirrel at 7.1nm from 'touchdown'.

At 1333:45, the BE58 pilot advised Zone, "Thruxton in sight". Zone immediately replied, "[BE58 c/s] roger, squawk 7000, freecall Thruxton 1-3-0 decimal 4-5 good day", which was acknowledged; Figure 2 depicts the incident geometry at this point.

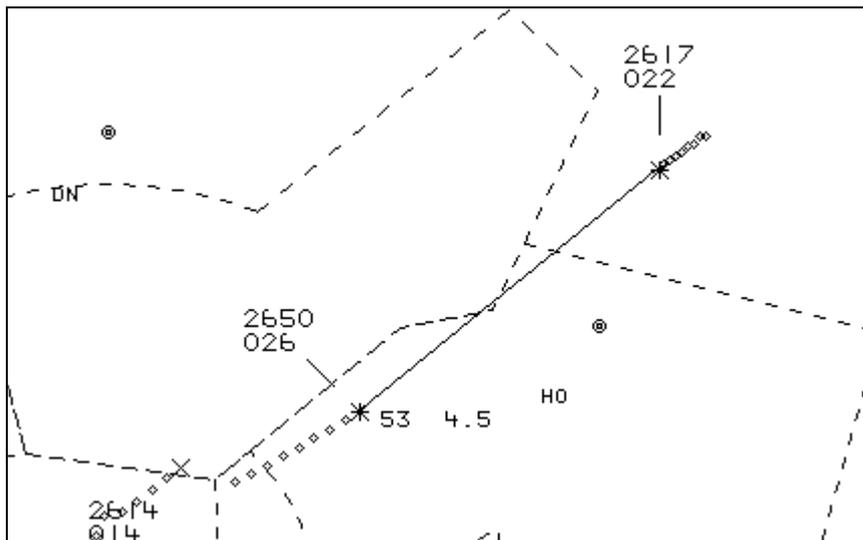


Figure 2: Incident Geometry at 1333:45.

At 1334:02 the BE58 began to squawk Mode 3/A 7000 then, at 1334:06, commenced a slow descent inbound to Thruxton. At that point the Squirrel was 2.8nm NE of the BE58, heading 235°, indicating 2300ft; the BE58 was tracking NE'ly indicating 2500ft. The Letter of Agreement between MOD Boscombe Down and Thruxton airfield states that ac recovering to Thruxton should enter the ATZ at 1200ft AAL (1112ft Boscombe QFE) and that:

'unless otherwise coordinated with Thruxton A/G, aircraft transferred to Thruxton A/G frequency must be expected to comply with the notified entry level. To reduce the possibility of inadvertent CMATZ or ATZ penetration, arriving traffic from the north/east/southeast will normally be routed via a point 1 NM north of Andover. Once the aircraft has reported at this point it will be advised to free-call Thruxton A/G.'

The Letter of Agreement does not specify the arrangements for ac recovering to Thruxton from the S, W or SW. SATCO Boscombe has related that this omission is due to the rarity of Thruxton recoveries from the W but has stated that these profiles are covered in Boscombe ATC trg.

Shortly after Talkdown advised the Squirrel pilot that the ac was approaching descent point, they observed on the PAR display 'pop-up traffic' descending onto the glidepath screen and appearing in '[the Squirrel's] 12 o'clock'. Subsequent conversation with the unit confirmed that the controller perceived there to be a risk of collision in both azimuth and elevation. At 1334:33, Talkdown advised the Squirrel's pilot, "...there's traffic, pop-up traffic, 12 o'clock, 1 mile, are you visual?" and the pilot immediately advised that they were "...visual." Based upon the Squirrel pilot's report, the timing of the TI was co-incident with his visual acquisition of the BE58; however, the instructor's perception was that the BE58 was 'below [them] but climbing'. The pilots of both ac reported taking action to avoid the conflict, although this was not evident on the radar replay.

RA 3024(3) supported by MMATM CH24 Para 43 states that:

'With regard to radar separation, there are no set requirements to be maintained by the PAR controller... In this sense therefore, the PAR controller's duties will provide the pilot with the necessary information to avoid a collision rather than to maintain any specified separation distance...[where the conflicting ac is displayed in both elements with a collision risk only apparent in one] no avoiding action [is] required. Traffic Information [is] to be provided to [the] pilot if considered relevant...[where a] collision risk is apparent in both elements [of the PAR display] advice on suitable action for collision avoidance [should be] passed to [the] pilot together with information on [the] conflicting traffic. Instructions for manoeuvres in a vertical plane should normally only result in stopping descent or applying a climb. Where a heading change is involved, aircraft should be climbed to the relevant RVC height if the aircraft cannot be maintained within PAR Azimuth cover'

The CPA occurred between radar sweeps at 1334:44 as the Squirrel passes around 0.1nm down the BE58's starboard side; the radar sweep prior to the CPA shows the BE58 100ft below the Squirrel with the next sweep showing the BE58 200ft below. The BE58 pilot reported that he 'noticed a helicopter about 1.5nm away flying in the opposite direction below me' and 'stopped [his] descent at about 2000ft [Boscombe QFE] and turned slightly left in order to keep the helicopter in sight until it passed'.

Notwithstanding the responsibilities for both pilots to see and avoid each other, this Airprox occurred as a result of Zone releasing the BE58 to Thruxton, introducing the potential for conflict with the Squirrel. Whilst this investigation has determined that there were procedural weaknesses evident in the MoD Boscombe Down and Thruxton airfield Letter of Agreement, resolving those weaknesses would not have prevented this incident. Zone was aware from his training of the potential for the BE58's profile to conflict with RW23 IFR traffic; however, an 'unthinking moment' caused him to release the BE58 without first assessing the situation. Zone has intimated that his workload leading up to the decision to release the BE58 was a causal factor to that decision. Whilst this is not borne out by the taskload itself, it is the controller's perception of that taskload and his ability to deal with it that will have begun to determine his workload. Talkdown's quick response to the conflict was laudable; however, it was not in line with that outlined in MMATM Chapter 24 Para 43. The unit has related that the controller was surprised by seeing an unknown ac appear on PAR which provoked a 'startle response', in this case the automatic provision of TI to the Squirrel, rather than deconfliction advice; albeit that they requested confirmation that the pilot was visual. It is reasonable to argue that, had the pilot replied that they were not visual, sufficient time remained for Talkdown to provide some deconfliction advice. Moreover, it is also reasonable to argue that Talkdown's reaction could have been conditioned by 2 factors: that the Squirrel was in receipt of a TS and the rarity of conflicting traffic on PAR; thus the correct response was not automatic. A brief and un-scientific 'straw-poll' of a small number of RAF ATM units determined that the training and checking of controller responses to conflicts on PAR made inconsistent use of synthetic training aids. Whilst traditional training methods are used to determine that the controller understands the theoretical requirements of MMATM Chapter 24 Para 43, this is no replacement for the 'conditioning' style of training that can be achieved using synthetic training aids. RAF ATM Force Orders 300.135.6 already states that the ATA3 simulator '...should...be utilized to allow controllers to practise procedures that may be seldom witnessed in the "live" environment such as: RPFL [Radar Practice Forced Landing], formation splits/joins, Deconfliction Service/avoiding action, emergencies and any infrequent local procedures'.

This investigation has also highlighted a potential issue with MMATM Chapter 24 Para 43 in terms of the controller's ability to detect a risk of collision on the PAR display and what they must achieve in terms of separation. It is reasonable to argue that a controller will assess the risk of collision in worst case terms but common understanding of the separation requirement is to achieve a gap between contacts on the display. However, due to the nature of the processing of the radar data to enable

their display to the controller, the radar contact does not represent the physical extremities of the ac. Thus, there is a possibility that controllers could achieve a gap between the radar contacts on the display but have no physical separation between the ac or the separation could be such that one or both ac are affected by turbulence.

## Recommendations

BM SPA has recommended to the Chief Test Pilot at MoD Boscombe Down that they consider reviewing their Letter of Agreement with Thruxton airfield, specifically with regards to the inclusion of arrival profiles from the W, S and SW.

BM SPA will highlight to RAF ATM units, through RAF ATM STANEVAL, the correct controller responses to conflicting traffic when providing ATS to ac on a GCA, and the value of simulating conflicting traffic on PAR.

BM SPA will liaise with JHC and RN Fleet ATM to highlight the learning points raised by this incident.

BM SPA has recommended to the MAA that they consider reviewing MMATM Chapter 24 Para 43 to determine whether the guidance for controllers is sufficient in assessing and achieving collision avoidance requirements.

BM SPA has recommended to the RAF ATM Force Command that they consider revising RAF ATM Force Orders 300.135.6 to include specific reference to avoiding action on PAR.

**HQ JHC** comments that it agrees with the conclusion from BM SPA and supports the recommendations. However, whilst not a direct contributing factor, the fact that the Traffic Advisory System (TAS) had been disabled, could have contributed to a reduced situational awareness of the BE58 by the Squirrel crew. Clear direction is given in the Units Standing Operating Practices (SOPs) on the use of the TAS.

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

Information available to the Board consisted of the reports from the pilots, the PAR Controller and the Boscombe ATC Supervisor as well as the radar recording and RT transcripts.

The discussion initially focussed on the actions of the ATC team. It was clear that the Zone controller had released the BE58 too early, which may have been an inappropriate conditioned response following the BE58 pilot reporting visual with Thruxton. ATC Members agreed that the Zone controller should have assimilated the situation more carefully before releasing the BE58 and the Board concluded that the early release was the Cause of the Airprox.

The PAR controller has azimuth and elevation displays which are stretched to allow more accurate 'talkdown' guidance to be given to pilots. This display format makes it difficult to assess the position of conflicting ac or offer deconfliction advice. PAR traffic is normally protected by the Director and Approach controllers and it is rare for PAR controllers to have to offer deconfliction advice. Consequently, the Board felt that the PAR controller had done extremely well to offer effective TI.

The incident has also highlighted an anomaly in the PAR regulations which require controllers to try and achieve a 'gap' between radar returns. Due to the processing of the radar, the ac return does not represent the size of the ac and there is a possibility that the gap achieved could be unacceptably variable. HQ Air ATC is investigating this issue.

The Squirrel had a TAS system fitted but the instructor had muted the alerts in order to avoid distracting the student pilot. As the TAS display is not in a position where it can easily attract the pilots' attention, it was felt that muting the system was not good practice as it might otherwise have offered earlier warning of this confliction.

Discussion turned to the BE58 pilot's actions and whether he had avoided the Squirrel by a large enough margin. While the Board was satisfied that the BE58 pilot's early sighting of the Squirrel had removed any risk of collision (Risk Category C) the relatively close pass was unwise and caused the Squirrel pilot concern.

The Board agreed that the safety barriers pertinent to this Airprox were ATC and aircrew rules and procedures, visual sighting, controller and aircrew action and situational awareness gained from RT and ACAS. As the Squirrel's TAS does not offer deconfliction advice compliance with a TCAS RA was not relevant. It was agreed that overall these barriers had offered a 'limited' effect and the Airprox was allocated a score of 4 on the Event Risk Classification Matrix.

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

Cause: The Zone Controller 'released' the BE58 in to conflict with the Squirrel, which was on PAR.

Degree of Risk: C.

ERC Score: 4.