

## **AIRPROX REPORT No 2010083**

Date/Time: 1 Jul 2010 1256Z

Position: 5110N 00208W (14nm W of  
Boscombe Down A/D - elev 407ft)

Airspace: London FIR (Class: G)

Reporting Ac Reporting Ac

Type: Basset CC1 Dornier Alphajet

Operator: MOD ATEC MOD ATEC

Alt/FL: FL55 ↓FL50  
SAS SAS

Weather: VMC CLOC VMC CLOC

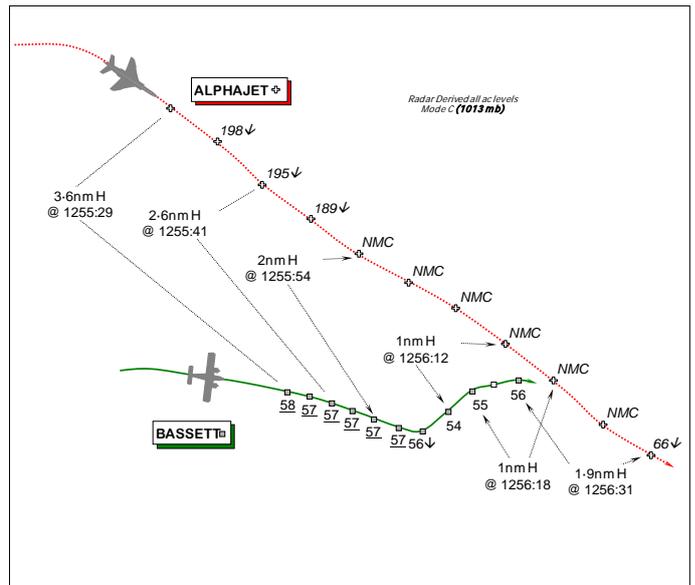
Visibility: 30km 30km

Reported Separation:

1000ft V Not seen

Recorded Separation:

1nm H



### **BOTH PILOTS FILED**

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

**THE BEAGLE BASSET CC1 PILOT** reports he was conducting a local dual training flight from Boscombe Down whilst in receipt of a TS from Boscombe RAD. A squawk of A2611 was selected with Mode C; neither Mode S nor TCAS are fitted. He was operating in a block between FL40-100 on a discrete frequency of 243.4MHz [Stud 15] in VMC with excellent horizontal visibility and visibility to the ground. Heading 100° at 135kt, he observed an Alphajet directly overhead and overtaking, about 1000ft above his ac on the same course. No avoiding action was necessary, but no TI had been passed about the Alphajet. The controller was challenged three times, but no reply was received to either transmission. A channel change to Stud 5, the common RAD frequency, was made and contact regained. At the same time, a Tornado reported airborne and eventually crossed overhead 1000ft above his ac without being called out either. After challenging RAD, the controller replied, 'we are busy', so an Airprox was filed.

After landing a telephone call to the ATC Supervisor revealed that the RAD controller was under training supervised by another controller. The crew of the Alphajet was also questioned as well; they claimed they had never received any TI about his Basset under their TS either, had not seen or been aware of his ac's location, whilst descending out of his block FL50-200 for recovery. He assessed the Risk as 'Medium'

The ac has a white, blue and red colour-scheme.

**THE DASSAULT-DORNIER ALPHA JET PILOT** reports he had been conducting dynamic flight test techniques training in a block from FL50 to FL240 under a TS from Boscombe Down ATC. The assigned squawk was selected with Mode C on; the ac is black with white wing tips and the white HISLs were on.

On completion of the medium altitude training, the aircraft was turned onto a suitable heading and a descent was carried out in VMC at 0.7Mach for recovery to base. During the descent, no warning of any proximate traffic was received from ATC; the aircraft's flight path was cleared by lookout. After landing, the crew was made aware that an Airprox had occurred during the recovery descent. The Beagle Basset was not seen, therefore, he was unable to make an assessment of the Risk.

He added that the pilot workload was low during the recovery phase and stressed that the vision from the front of the cockpit to clear his ac's flight path was good.

**THE BOSCOMBE DOWN RADAR CONTROLLER (RAD)** reports that at the time of the incident, the Basset was manoeuvring some 15nm W and NW of Boscombe Down and operating on frequency 243.4MHz. The Alphajet was about 25nm W of the aerodrome at FL150 operating on Stud 5 and a Tornado was preparing to depart, the crew having been instructed to contact Stud 5 once airborne.

As the Basset started to fly S at FL60, the Alphajet crew called for a GCA recovery to RW23 and was vectored towards Boscombe Down and instructed to descend to 3000ft QFE. During the internal handover to DIRECTOR (DIR), a Tornado crew reported airborne, climbing not above FL240. The Alphajet descended quickly and was about 4000–5000ft 10nm W of the aerodrome, therefore, it was called to the Tornado crew, who reported visual so the handover was continued. As the handover was taking place, the Basset crew made a couple of RT calls on 243.4MHz [Stud 15] and was instructed to standby. Once the handover was complete, the Basset pilot called on Stud 5 questioning why he was not receiving any calls on 243.4MHz, why he had not been told about the inbound Alphajet or the departing ac and reporting that he was filing an Airprox.

**THE BOSCOMBE DOWN ATC SUPERVISOR (SUP)** provided a full and frank account. He reports that at the time of the Airprox all positions were manned, with fresh controllers. The Unit is under substantial pressure to train controllers as quickly as possible but had struggled with meagre traffic levels throughout the week. However, there was suddenly an increasing level of traffic during the period 1200-1300Z. The Zone position - C/S RADAR - had 4 ac working in the Boscombe 'Triangle', 3 of which were on 371.825MHz (Stud 5) and one on 234.4MHz (Stud 15), which would provide excellent training value so he decided to reshuffle some personnel in order to get a trainee into the RAD seat. The trainee in question had only had half of her lunch break but was happy to go on console.

In addition to this, as the Local Examining Officer (LEO), he had previously been trying to complete a Supervisor check on another controller who was in the DIRECTOR (DIR) seat. The desperately needed radar pattern traffic was now about to materialise as some of the ac in the 'Triangle' started to recover. Although not under formal examination conditions because he was on duty as Supervisor, he was watching what the candidate in DIR was doing from his adjacent Supervisor position as the controller was about to have 3 ac in the pattern. BDN Approach (APP) had very little workload and was also a qualified and experienced Supervisor who was therefore asked to keep an eye on RAD's traffic levels, as the greater proportion of his own attention was focused on the DIR position.

An ac called for recovery from the NE of Yeovilton, which was handed over to DIR, who by this time had recovered the preceding ac into the visual cct and had a Tutor downwind on his second approach. Very shortly after this, the Alphajet crew called for recovery about 8-9nm W of BDN. He instructed RAD to descend the Alphajet down to 2500ft and hand it over to DIR as the slower Tutor, ahead in the pattern, was descending through 2000ft. RAD complied with this instruction, but then her workload began to increase with a Tornado on departure. Although a 'Call for Release' (CFR) was in place, APP had released the Tornado without a climb out restriction (COR) against the inbound Alphajet. The reason for this was that at the time of the take-off clearance, the inbound was sufficiently far away not to be a problem. Unfortunately, due to the length of time between the take-off clearance and the Tornado actually leaving the RW, this separation had reduced to a point where, in hindsight, a COR was needed.

The trainee RAD controller was working the Basset on the quiet frequency, the Alphajet descending inbound towards the aerodrome ready for handover and about to get the Tornado outbound on a reciprocal track. DIR had traffic downwind in the pattern, another ac inbound from about 20nm W and was about to be handed the Alphajet at about 7nm W. APP had only one or two ac on under BS, and LARS was not busy. RAD was fairly busy on Stud 5, having just completed a radar handover and about to commence another, whilst also receiving a further outbound track. The RAD

mentor did not hear the Basset pilot on Stud 15; however, having heard the RT tape replay, the mentor is now aware that the Basset crew had called several times without reply and had then been told to 'standby' twice whilst the handovers were in progress. During this period, the RAD mentor had removed her headset several times so that she could liaise verbally with the controllers and had lost SA on the departing Tornado. His [the SUP's] instruction, which in hindsight was unnecessary, to RAD to descend the inbound Alphajet had caused a conflict against the Tornado, which was climbing. To make matters worse, the Tornado, flying VFR, had turned onto a westerly track directly towards the inbound Alphajet, having had no information on its position and although there was approximately 5-6nm separation at this point, a dangerous situation was now developing. APP suggested to RAD that the inbound jet be turned onto 070° to resolve the conflict, however he did not believe that RAD heard this as she was busy providing TI to each of the conflicting ac. The Tornado crew called visual with the Alphajet and vice versa and both ac continued on course. All of this took place on 371.825MHz - Stud 5. The Basset crew had been on the quiet frequency of 234.4MHz – Stud 15 - and had not been given TI on the two occasions it would have been beneficial. In addition, RAD had perhaps also neglected the Basset during the handovers to the DIR. The Basset crew then switched to Stud 5, which caused some confusion as RAD was trying to reply on Stud 15, not knowing that the crew had changed frequency. The Basset pilot announced that he was now on Stud 5 and asked if there was a problem with the other frequency, as he had not heard any calls for some time. RAD informed him that they had been busy on Stud 5. He appeared to be annoyed that he hadn't been told about this, and asked for guidance as he believed that he had come within 2000ft of two ac, which were not called. At this point, the RAD mentor stepped in and stated that traffic had not been called as (in her opinion) it was irrelevant. He believed this may have upset the Basset pilot further, who declared that he would file an Airprox, which the mentor acknowledged. A relief was then organised for RAD first and reporting action commenced.

The situation that had developed regarding the Alphajet and Tornado on Stud 5 was a more pressing matter to resolve than providing TI to the Basset. Whilst the TS provided for the Basset had been deficient, due to workload, he did not believe that an Airprox occurred. Nevertheless, he was sympathetic to the pilot's complaint and it is clear that the incident warranted reporting action.

From his perspective he was:

- Under operational pressure to provide as much training as possible.
- Also under similar pressure to complete the Supervisor check ride.
- The live traffic that was needed for both occurred at the same time.
- His attention as Supervisor was not equally divided amongst the control staff.
- He lost SA on the departing Tornado and inadvertently created a problematic situation for RAD, which increased their workload and contributed to degradation of service for the Basset crew.

This was a lesson in priorities for him; he incorrectly placed the needs of training and endorsement above his immediate duties as Supervisor, as a result, a potentially unsafe situation developed.

**SATCO BOSCOMBE DOWN** comments that whilst acknowledging the Basset pilot's concerns, he did not feel that an Airprox actually occurred, more that the pilot correctly wished to highlight certain points and see what lessons can be learnt. The whole situation arose due to a number of human factors that could possibly have been either avoided or mitigated against and the controllers involved have been de-briefed as to their part.

The RAD controller on whose frequency the incident occurred was instructing at the time and was in the area of 'how much do I allow the UT to continue on her present course' to gain the experience as to when or if he should have taken control. Had all ac been on the same frequency everyone would have been aware of the workload; however, the instructor was dealing with the priority and did not assess the Basset to be in unsafe conflict. Had the controller cross-coupled the frequencies each pilot would have known the work rate, or alternatively and as a minimum, a reduction of service due to workload should have been broadcast to all involved.

The SUP has been overly critical of himself. Despite his best intentions there is still a limit to how much a Supervisor can assimilate and although his attention was more focused on DIR, which is the traditional position where problems occur, he had an extremely experienced controller in each of the other positions who could have been more proactive in this situation. The point that all Stations are under pressure to endorse controllers is nothing new and although possibly a contributory factor, did not in his opinion, have an over bearing impact on this situation.

There have been lessons learnt in which my controllers have taken on board but it bears more to experience levels rather than to changes in procedures.

**HQ 1Gp BM ATC SM** reports that although from the RAD perspective the transcript commences at 1256:15, the Unit Safety Management Officer at Boscombe Down (BDN) has confirmed that there are no transmissions on the RAD frequencies for the 5min leading up to the occurrence timeline.

Both ac involved in the Airprox and the Tornado were operating under a TS and no reductions of service were issued. The Alphajet entered a descent from FL200 at 1255:29 and is shown descending through FL195 at 1255:41, at which point the Basset is about 2.6 nm SSE indicating a level cruise at FL57. The indicated level at 1255:47 was FL189; the Alphajet's Mode C data then 'drops out' and is not shown again until 1256:31, indicating FL66 [1000ft above the Basset]. Consequently, the Alphajet descended 12300 feet in 37sec over a distance of approximately 4.3nm, equating to a RoD of broadly 16800ft/min, assuming the descent was maintained throughout this period. This high RoD will have caused the SSR Mode C information to 'drop out' and it is highly likely that a similar effect will have been witnessed on the BDN radar displays, although this is impossible to determine conclusively.

The Alphajet crew called RAD at 1256:15 requesting a, "*pickup for radar PAR*" at which point the Basset was about 1nm SW at FL54. The end of the Alphajet pilot's transmission on Stud 5 was coincident with the Basset crew's transmission on Stud 15. The CPA of 1nm horizontally is maintained through 1256:18, but it is impossible to determine the vertical separation in the absence of Mode C data. At this point RAD had 2 ac on frequency (the Alphajet on Stud 5 and the Basset on Stud 15) with a 3<sup>rd</sup> (the Tornado) about to get airborne. CAP774 states that

"..traffic is normally considered to be relevant when, in the judgement of the controller, the conflicting aircraft's observed flight profile indicates that it will pass within 3nm and, where level information is available, 3000 ft of the aircraft in receipt of the Traffic Service. However, controllers may also use their judgement to decide on occasions when such traffic is not relevant, e.g. passing behind or within the parameters but diverging."

When RAD responded to the Alphajet pilot at 1256:24, the radar replay shows that the 2 ac were no longer a factor to each other and that there was no longer a requirement for RAD to pass TI to these ac about each other. However, an earlier opportunity to pass TI to the Basset and the Alphajet existed. Had RAD had access to Mode C for the Alphajet they would have been expected to be aware of the risk of conflict between the 2 ac. However the BDN USMO has confirmed that there were no transmissions on the RAD freq for 5min prior to the Alphajet crew calling for recovery, which suggests that the RAD controller did not perceive a risk of conflict. This supports the hypothesis that the high RoD of the Alphajet caused the ac's SSR Mode C information to drop off BDN's radar display, thereby removing the visual prompt for the impending conflict. However, this characteristic is well known and, given that the Mode C data was not displayed for around 37sec, this should have provided an opportunity for RAD to recognise the conflict and provide TI to the Basset and Alphajet crews before the latter called for recovery.

BDN reports that the RAD position was manned by a trainee and an experienced mentor. It is possible that the trainee was unaware of the problems associated with high RoD/RoC and their impact upon Mode C data. The absence of any input from the RAD mentor suggests that they did not detect that the Mode C information was not being displayed, which could have alerted them to the high RoD of the Alphajet towards the Basset. Given the length of time that the Mode C had not been displayed the level of oversight provided by the screen controller to the trainee is questionable.

Normally, the SUP would provide an additional level of oversight at this point; however, the SUP had tasked another SUP qualified controller on APP with monitoring RAD, allowing the SUP to focus on DIR. Whilst it is unclear what APP understood were their responsibilities towards RAD, the SUP reports asking them to 'keep an eye on the RAD traffic levels' which does not imply the level of oversight that a SUP normally exercises. This lack of supervision can be seen to be a further contributory factor to the Airprox.

From 1256:15, when the Alphajet crew called for recovery, until 1258:41, it is clear that RAD's workload was high, with no opportunity to respond either to the Basset crew's RT call or to pass TI to them about the Alphajet, given that RAD had, arguably, higher priority tasks. CAP774 states that: 'controllers shall aim to pass information on relevant traffic before the conflicting aircraft is within 5nm'. Given RAD's workload, it is clear that the TI passed to the Tornado crew about the Basset at 1257:57, "*traffic 12 o'clock 2 miles crossing right left at flight level 5-5*" represented the first opportunity to pass any information. At this point, although RAD described the range between the Tornado and the Basset as "*..2 miles..*" the radar recording reveals it was about 3.5nm, with the Tornado climbing through FL65, already some 900ft above the Basset.

[UKAB Note (1): Minimum horizontal separation between the Basset and the Tornado occurred at 1258:56, as the westbound Tornado passed 0.6nm astern of the southbound Basset; vertical separation of 3600ft was evident at this point - the Basset indicating FL56 and the Tornado FL92 respectively.]

CAP774 states that:

"..there may be circumstances that prevent controllers from passing timely traffic information ... e.g. high workload... Controllers shall inform the pilot of reductions in traffic information along with the reason and the probable duration; however, it may not always be possible to provide these warnings in a timely fashion."

Insofar as it applies to the Basset and the Tornado, RAD's workload prevented them passing TI to the Basset crew and prevented them passing a reduction of service to all ac on their frequency. RAD was however able to supply TI to the Tornado on the Basset. This was clearly a short burst of intense workload affecting the RAD position that was exacerbated by operating 2 separate frequencies. Whilst SATCO BDN has stated that the RAD mentor was trying to ensure that the trainee received the most training value, CAP774 states that 'controllers shall aim to pass information on relevant traffic before the conflicting aircraft is within 5 NM.' Insofar as it applies to the reported Airprox between the Basset and the Alphajet, the 37sec absence of Mode C data should have allowed both the trainee to assimilate the information and pass TI and for the mentor to interject to provide TI in the absence of a response from the trainee. The fact that this did not occur suggests that neither controller perceived the risk of conflict, drawing into question the level of oversight provided by the screen to the trainee.

The self imposed pressure on the SUP to eke out the maximum utility from this busy session for ATC training, seeing them delegate part of their Supervisory responsibility can be seen to have been a contributory factor to this Airprox. Insofar as the Basset and the Tornado was concerned, within the limitations imposed by their workload, RAD fulfilled their obligations for the provision of TI under a TS.

BDN ATC are completing work to include high RoC and RoD profiles and their subsequent impact on the surveillance picture within local training materials. When operating at high intensity levels, all ac will be put onto one frequency if BDN controllers believe that the provision of TI to all ac may be prejudiced. All BDN mentor and instructor controllers have been briefed that whilst they should give trainees every opportunity to learn, this should not be at the expense of safety and expedition.

## **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 authority.

The Board noted that the recorded LATCC (Mil) data shows that the Alphajet's Mode C was not captured by the Burrington SSR recording in the period of 44 sec before the point of minimum horizontal separation. Members were aware that, in general, a RoD in excess of 10000ft/min will not be captured by ground based SSR interrogators or TCAS equipment. So when the Alphajet crew initiated their recovery to base, their high RoD – in the order of 16800ft/min - had prevented the Burrington SSR interrogator from displaying their descent because their steep descent caused the SSR Mode C information to 'drop out'. Pilots should always bear in mind that a RoD in excess of 10000ft/min could mask their ac's Mode C from SSR interrogators and importantly, make their ac invisible to TCAS, which might well prevent an RA from being triggered when warranted.

The LATCC (Mil) radar recording was all that was available to the Board, as Boscombe Down ATC does not record their data separately. Controller Members accepted that, in all probability, the Boscombe Down SSR would also have been affected in a similar manner (albeit that it rotates at a higher rate than the Burrington SSR and provides a quicker data refresh rate) and probably did not display the Alphajet's Mode C to the controllers as the ac descended. It was understandable that the Basset pilot was concerned when he did not get a reply on the quiet frequency he was operating on. If RADAR had seen the Alphajet's Mode C winding down then the controllers would almost certainly have proffered TI if they had the capacity to do so. However, the report from HQ 1Gp ATC shows that the RADAR controllers' workload was a factor here and both were apparently unaware of the Alphajet's descent before it passed the Basset. The Basset pilot was somewhat mistaken when he reported the Alphajet had passed directly overhead as the radar recording had shown that the minimum horizontal separation was 1nm as the Alphajet crossed from L - R ahead, just moments before its crew called RADAR. Moreover, when the Alphajet's Mode C was next evident it was 1.9nm away to the SE of the Basset and shown to be 1000ft above the latter whilst clearing rapidly to the SE. Although not illustrated here, when the Tornado passed by about 2½min later it flew clear astern of the southbound Basset with vertical separation of 3600ft.

There were clearly several points within the provision of the ATS, together with the Supervisory aspects, that had warranted review here and it was evident that the Unit had drawn some useful learning points from this report. However, the HQ Air (Ops) Member stressed that if the Basset pilot had been concerned about the absence of TI, then a better reporting mechanism was that of a Hazard Report on a DFSOR. As it was, given the geometry of this encounter and the separation evident, the Board agreed that this report had been the result of a sighting by the Basset pilot and no Risk of a collision had existed.

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

Cause: A sighting report.

Degree of Risk: C.