

AIRPROX REPORT No 2012066

Date/Time: 17 May 2012 1137Z

Position: 5107N 00149W (4nm
SW of Boscombe Down
A/D - elev 407ft)

Airspace: CMATZ (Class: G)

Reporting Ac Reported Ac

Type: Tornado GR4 DA40

Operator: HQ Air (Ops) Civ Club

Alt/FL: 1300ft↓ 1650ft
QFE (1002hPa) QNH (1013hPa)

Weather: VMC CLOC VMC NK

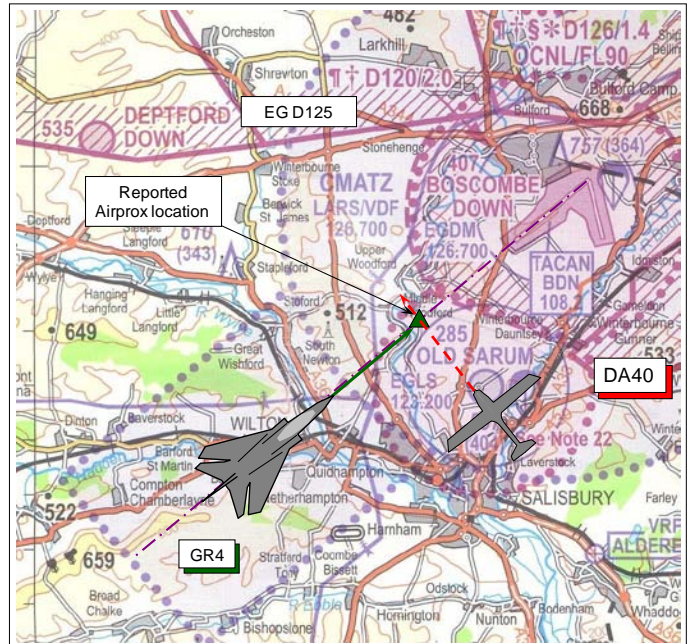
Visibility: 12km 15km

Reported Separation:

100-200ft V 900ft V/600m H

Recorded Separation:

Not recorded



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TORNADO GR4 PILOT reports he was in communication with TOWER whilst inbound to Boscombe Down for a visual join through initials to RW05. His ac has a grey colour-scheme and the HISLs were on. A squawk of A2602 was selected with Modes C and S on; TCAS is not fitted.

Approaching the visual cct heading 050° at 450kt, level at 1300ft QFE (1002hPa), he saw a flash of a light-coloured, probably white, ac – the DA40 - about 100-200ft just below and some 50-100ft off to starboard. There was no time to take avoiding action; he saw the DA40 far too late being occupied in searching for cct traffic before the break to land as it passed below his ac with a 'very high' Risk of collision. ATC had given details of those other ac in the cct area that were on a standard routing or lining up on the RW, but nothing was passed about any ac that would be crossing his approach path. He added the DA40 might have been obscured by the windscreen/HUD metalwork.

THE DIAMOND DA40 PILOT reports that he had departed from Shoreham bound for Old Sarum under VFR and was in communication with Boscombe Down ATC who monitored the whole incident. The squawk assigned by the Boscombe Down Controller was selected with Modes C and S on. The ac is coloured white and the HISLs were on; TCAS is not fitted.

Flying in a level cruise at about 1650ft QNH, heading 340° at 120kt, about 4nm SSW of Boscombe Down A/D [lat & long given], ATC informed them about the military jets and they were looking out for them. Two military jets (*sic*) were seen, which passed 900ft above and 600m ahead of his aeroplane; avoiding action was taken by descending with power selected to the idling position. He assessed the Risk as 'none', consequently, he finds it hard to believe that this was an Airprox - rather he thinks the military jet pilots wanted to frighten them.

THE BOSCOMBE DOWN LARS CONTROLLER (ZONE) reports that the DA40 pilot free-called Boscombe APP on 130.00MHz initially. APP instructed the DA40 pilot to free-call ZONE on 126.7, which he did, requesting penetration of the Boscombe ATZ en-route to view Stonehenge. The DA40 pilot was instructed to squawk A2650 and to remain S of Salisbury because a singleton Tornado GR4 was approaching Boscombe from the SW to join via Initials for RW05. The A2650 squawk appeared above Old Sarum A/D and he told the DA40 pilot again to hold S of Salisbury. The DA40 did not alter track and was getting closer to the centreline of RW05 so he suggested a southerly turn

to avoid the Tornado and the Boscombe Down ATZ; the DA40 pilot advised he would look out for the fast-jet. At this point he struggled to regain communications with the DA40 pilot as the GR4 was getting closer; he then suggested to the DA40 pilot to take a R turn onto a southerly heading to avoid the GR4. The DA40 was then observed crossing the approach centreline about 2nm SW of Boscombe Down with the GR4 to the W of the DA40 with both ac's Mode C indications reading the same; the radar returns then merged. He tried several times to contact the DA40 pilot with no response; the DA40 then flew N into Salisbury Plain Training Area (SPTA) - EG D125. The DA40 pilot was informed that he was in the Danger Area and to get out by turning S; the pilot responded that he would exit the Danger Area and wanted to fly back to Old Sarum. When the DA40 was S of the RW05 centre-line the pilot was told to free-call Old Sarum and to contact the Boscombe Down SUPERVISOR after landing.

THE BOSCOMBE DOWN ATC SUPERVISOR (SUP) reports that he was made aware of the DA40 squawking A2650 (Boscombe Down Conspicuity) overhead Old Sarum A/D, tracking NW indicating 1800ft Mode C (1013hPa) under a BS from ZONE en-route to Stonehenge. Because of the Tornado GR4 inbound via Initials to RW05, he instructed the ZONE controller to advise the DA40 pilot to remain S of Salisbury. The DA40 continued to track NW towards the approach some 2-3nm SW of Boscombe so the pilot was then instructed to take up a S'ly heading to remain clear of the inbound GR4 but at this point the controller was struggling to communicate with the DA40 pilot. The GR4 was tracking towards the DA40 at a fast rate, indicating the same height and the radar returns merged. The DA40 continued to track NW, penetrating the ATZ and the visual cct, before proceeding N into SPTA. The APP controller spoke to Salisbury OPS to inform them of the ac in their Danger Area. At this point we were able to contact the DA40 pilot and provided him with instructions to vacate the Danger Area and return to Old Sarum A/D.

He spoke with the pilot of the DA40 a short period later and explained what occurred. The DA40 pilot informed the SUP of his RT callsign; the pilot said he had been confused when instructions were passed using a different callsign and believed they were for another ac. He then spoke to the GR4 pilot who advised he was raising an Airprox report.

[UKAB Note: (1): APP replied to the DA40 pilot's initial free-call using an incorrect callsign and instructed him, using this C/S, to free call ZONE on 126.7MHz, which the DA40 pilot acknowledged. Thereafter, in response to the DA40 pilot's RT calls to ZONE, which used an all letter C/S, the controller replied using variously "xx463" and "xxx463", however, the DA40 pilot responded to the majority of these transmissions with the exception of those noted in the BM SM Report.]

BM SAFETY MANAGEMENT reports that both pilots report they were operating VFR in VMC.

The Met Office gives the Boscombe Weather as -

1050UTC: 25km visibility in nil weather, FEW cloud at 3500ft and BKN cloud at 9000ft and 13000ft.

1150UTC: 30km visibility in nil weather, FEW cloud at 3500ft, SCT cloud at 6000ft and OVC 10000ft.

However, the ADC reported that 'visual conditions made it very difficult to spot aircraft outside 3 miles...due to the cloud and...the light conditions.'

The GR4 crew was initially in receipt of a TS from DIR, left DIR's frequency 37sec before the CPA and called TWR 23sec prior to the CPA. The DA40 pilot was in communication with ZONE at the time of the Airprox, although no ATS had been agreed. [ZONE quotes in his written report that a BS was being provided to the DA40 pilot.] The pilot of the DA40 was a foreign national whose accent over the RT was felt by the BDN controllers involved to be 'difficult to understand.' The ADC reported that his perceived workload and task complexity were moderate; there were 2 ac on freq including the GR4. ZONE reported that their workload was low and did not report the task complexity; there were 2 ac on freq including the DA40.

The incident sequence commenced at 1132:55 as the DA40 free-called APP stating, “[DA40 C/S] *err D-A-40, V-F-R from Manston, 6 miles south of erm Old Sarum, is it possible to cross your airspace for sight-seeing at Stonehenge?*” In reply, APP requested that the DA40 pilot free-call ZONE and the ac left APP’s freq at 1133:54. APP wrote out a flight-strip with the wrong DA40 callsign and handed this to ZONE stating, “*freecaller from Old Sarum.*”

At 1134:04, the DA40 pilot free-called ZONE, stating at 1134:17, “[DA40 C/S] *DA40 from Manston, 3 miles south of Old Sarum, erm is it possible to cross your airspace for err sight seeing at Stonehenge?*” ZONE replied, “[wrong DA40 C/S] *squawk 2-6-5-0, hold south of Salisbury, one fast-jet recovering to Boscombe.*” The DA40 pilot replied, “*sorry, please say again and erm slow.*” At 1135:10, using a slower speaking rate, ZONE replied, “[wrong DA40 C/S] *squawk 2-6-5-0, can you hold south of Salisbury, one fast-jet recovering to Boscombe.*” The DA40 read back the squawk, then apologised and asked ZONE to, “*please say again the rest of your message.*” Using a more direct tone of voice, at 1135:39, ZONE re-stated to the DA40 pilot that they should, “*hold south of Salisbury [Salisbury is approximately 4.5nm SSW of BDN], which is your current position, one fast-jet recovering into Boscombe now!*” The DA40 pilot immediately replied that they were, “*looking out for that track.*” At this point the GR4 was 11.3nm SW of BDN, tracking 050°, indicating 2200ft, in receipt of a TS from DIR; the DA40 was not displayed on the radar replay, though the pilot subsequently reported flying at 1650ft QNH [about 1320ft QFE (1002hPa)]. The unit has stated that at the time of the DA40 pilot’s initial calls to APP and ZONE, the DA40 was not painting on radar - a reasonable suggestion given the likely relatively low radar cross-section of a DA40. An alternative hypothesis proposed by the Unit was that the DA40’s primary return was masked by the presence of multiple primary returns from ac operating in the vicinity of Old Sarum. Consequently, ZONE would only be able to determine the identity and location of the DA40 through its SSR return. Moreover, the unit has stated that Old Sarum traffic is required to arrive/depart from/to the S; consequently, even if the DA40 had painted on primary radar, it would not necessarily have been of concern to DIR until it had passed Old Sarum. Based on the DA40 pilot’s reported speed, it is likely that at 1135:55 the DA40 was S of Old Sarum. The unit’s investigation determined that ZONE’s instruction to the DA40 at 1135:39, to, “*hold south of Salisbury, which is your current position*” was based on the DA40 pilot’s reported position of, “*3 miles south of Old Sarum*”, not a radar derived position.

Based upon the report submitted by the SUP and subsequent investigation by the unit, given that ZONE was a newly endorsed, ab-initio controller, the SUP was focussing the majority of his attention on ZONE, prompting them to re-iterate to the DA40 pilot the instruction to remain S of Salisbury.

At 1135:55, the GR4 crew left DIR’s frequency having been given TI on an un-related ac crossing the extended centre-line on a SE’ly track indicating 2800ft; DIR has stated that they did not believe that there was any further traffic to affect the GR4 and did not recall seeing the DA40 on their surveillance display.

At 1136:09, the GR4 crew called TWR to request to join the visual cct. The ADC instructed the GR4 crew to, “*join runway 0-5, Q-F-E 1-0-0-2, one Tutor just lining up for departure on the main*”, which was acknowledged immediately at 1136:17. Following this acknowledgement, at 1136:22, the ADC issued a take-off clearance to the un-related Tutor; the acknowledgement from the Tutor ended at approximately 1136:31. The ADC has stated that their focus was on sequencing this un-related Tutor with the recovering GR4.

During the ADC’s transmission at 1136:16, ZONE transmitted to the DA40 pilot, “*suggest a southerly turn to the right to avoid the fast jet currently at your height, half a mile to the west*” which was not acknowledged. Subsequent investigation by the Unit has determined that this call was prompted by ZONE observing the DA40 squawking A2650 in response to ZONE’S code setting instruction; hence 1136:16 represents the first time that ZONE could positively determine the DA40’s position. At this point, the GR4 was 6.7nm SW of BDN, tracking 050°, indicating 1800ft. Based upon analysis of the radar replay, the GR4 was no more than 2nm W of the DA40 at 1136:16.

Based upon the DA40’s reported speed and previous position reports and analysis of the radar replay, it is likely that the CPA occurred at around 1136:32, 4.1nm SW of BDN, as the GR4 indicated

descent through 1500ft. The GR4 pilot assessed that the DA40 passed 100-200ft beneath their ac and that they saw the DA40 at or about the CPA. The DA40 pilot assessed minimum separation as 900ft vertically and 600m laterally; however, this is not supported by the available evidence. Unfortunately, the DA40 pilot did not report the range at which they first sighted the GR4.

The primary causal factors in this Airprox were the flight of the DA40 into conflict with the GR4 and the DA40 pilot's decision not to follow the instructions from ZONE to hold S of Salisbury and, by inference, the extended centre-line. Whilst the suggestion has been made that the DA40 pilot did not understand ZONE's instructions, responses during the incident sequence and the DA40 pilot's written report suggest that this is not the case. It appears reasonable to argue, therefore, that the DA40 pilot made a conscious decision to continue their NNW'ly track into conflict.

In terms of the ATM aspects of this incident, "reflections" on best practice in this case are fraught with difficulty, given the potential for hindsight bias. Subsequent to the investigation by the unit and based upon the DA40 pilot's responses, the continued NNW'ly track and the time at which the DA40's assigned SSR code was observed, the radar control team realised at around 1136:16, that the DA40 pilot was not going to hold S of Salisbury. Moreover, as previously stated, the Salisbury/Old Sarum area is viewed by the unit as a geographic 'line-in-the-sand' that, once crossed, precipitates further action. In this case, APP attempted to call the ADC on the landline; however, the ADC did not answer as they understandably prioritised issuing joining instructions to the GR4 crew and take-off clearance to the Tutor. An additional course of action that does not appear to have been considered would have been for the GROUND controller to have been passed the warning. Given that the DA40 was not following ZONE's instructions, once the GR4 crew left DIR's freq at 1135:55, the ATC personnel within the ACR were unable to affect the outcome of the Airprox.

The remaining ATM related safety barrier was the ADC. Notwithstanding that the ADC considered his workload and task complexity to be moderate, BM SM contends that the 2 ac on freq should not routinely have generated this perception. However, it is likely that the ADC's perception of workload is a description of the point event where they were engaged in the decision making process to sequence the GR4 and Tutor, rather than a descriptor of their workload and task complexity throughout the incident sequence. In terms of the ADC's taskload history during the latter stage of the incident sequence, there is a near-constant level of RT, which would have been associated with a requirement for the ADC to focus their attention visually on the GR4 and Tutor in order to sequence them. In so doing, it is reasonable to argue that the ADC's attention would not routinely have been drawn towards the Hi-Brite aerodrome traffic monitor and, given the reported conditions and the physical appearance of the DA40, it would be unlikely that the ADC could have visually acquired the DA40 4nm from BDN. Whilst best practice might suggest that the ADC could have utilised the Hi-Brite to identify the developing conflict and provide a warning to the GR4 crew, this observation is made with the benefit of hindsight. The timing of the sequence of events, combined with the requirements placed upon the ADC to deal with those events and the short window of opportunity afforded the ADC between 1136:16 and 1136:32, all militated against the ADC being able to affect the outcome of this occurrence.

UKAB Note: (2): This Airprox occurred outwith recorded radar coverage.

HQ AIR (OPS) comments that notwithstanding the fact that the DA40 pilot did not comply with ATC instructions (and subsequently penetrated an active Danger Area), ATC could have taken further measures to inform the GR4 crew of the presence of the errant DA40; the SUP could have made more of an effort to get a message to the VCR regarding the developing conflict, perhaps by using the Radar Clearance Line. This incident further highlights the need for a Tornado CWS to be fitted as soon as possible.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

It was explained to the Board that the correct all-letter C/S consistently used by the DA40 pilot, for whom English was not his first language and who reportedly had a strong foreign accent, had not been used when APP and ZONE replied to the DA40 pilot's RT transmissions. The Board understood how the pilot's accent may have been responsible for ATC's misunderstanding of his C/S and how this error was evidently perpetuated by APP in their liaison with ZONE and by recording the wrong C/S on the fps. However, the Members noted that, although the DA40 pilot may have been confused, he replied to the majority of ZONE's calls even when the wrong C/S was used and made no attempt to correct the controllers' error. With little other activity on ZONE's frequency, Members agreed it was not fundamental to the Cause; nevertheless, it was suggested that it could have had a bearing on the tardy responses from the DA40 pilot to some of ZONE's transmissions.

Whilst a Member noted that no 'contract' had been established between ZONE and the DA40 pilot over the provision of an ATS - the controller was endeavouring to provide a BS, he reports - Members recognised the limited mandate of the controller to pass executive instructions to the civilian DA40 pilot operating in Class G airspace under a BS. Ultimately, the DA40 pilot had remained outside the Boscombe Down ATZ, had chosen to call ATC, "...3 miles south of Old Sarum.." to ask if, "...possible to cross your airspace for...sightseeing at Stonehenge?" The Board noted that the DA40 pilot was not compelled to call Boscombe Down: the MATZ has no status as a controlled airspace, albeit it is a regulated airspace for military pilots and any instructions issued by ZONE to civilian pilots were advisory rather than obligatory. This prompted a discussion as whether a MATZ should be classified as Class D CAS for the benefit of civilian pilots, especially foreign pilots who have little conception of the status of a MATZ. However, a military controller Member highlighted that ZONE had not said 'no' to the DA40 pilot's request to fly to Stonehenge from his reported position 3nm S of Old Sarum, but then neither had ZONE acceded to the DA40 pilot's request. A Member opined that the foreign DA40 pilot showed little awareness of the UK airspace structure, in that he appeared to have entered the Old Sarum ATZ before the conflict and subsequently infringed a promulgated Danger Area after the Airprox had occurred. A CAT pilot Member agreed that the DA40 pilot's SA was poor, but all of ATC's actions were predicated on an assumption that the DA40 pilot would comply with the controller's recommended course of action. Patently he did not, for whatever reason, and although the radar recording does not illustrate this encounter it seems that the DA40 pilot took no account of ZONE's requests to either hold S of Salisbury or turn S'ly to remain clear of the GR4, which could have forestalled the conflict. This suggested to some Members that the Cause of the Airprox was that the DA40 pilot did not comply with ATC's recommendation to remain S of Salisbury resulting in a conflict with the GR4. However, this ignored the GR4 crew's responsibility to see and avoid traffic in accordance with the RoA. Military pilot Members were critical of the GR4 crew for flying at such high speed as it was not necessary to run-in to the break at 450kt. This gave little opportunity for ATC to intercede effectively when things went wrong and here it was evident that DIR had switched the GR4 crew to TWR only 37sec before the CPA and the crew then called TWR only 23sec prior to the CPA. Whilst BM SM had established that ZONE might not have been able to identify the DA40 on radar any earlier than when the squawk became evident at 1136:16, with any primary contact not obvious amongst the background Old Sarum cct traffic, the ZONE controller and the SUP certainly knew there was a civilian ac in the vicinity to the SE of the RW05 centreline, on a heading to cross it toward Stonehenge, whose pilot did not seem to be responding to ZONE's requests. Furthermore, the DA40's altitude was never positively established before the Airprox. The Board understood this was a difficult situation for ZONE and the SUP, but it was unfortunate that ATC had not forewarned the GR4 crew to look out for the DA40; the Board considered that a warning, albeit with little notice, should have been feasible through DIR or the ADC. A controller Member opined that on the evidence provided in the BM SM report the ADC was not busy and could have responded if warned by the SUP. Notwithstanding the ATS provided to the GR4 crew by either ADC or DIR, if the GR4 crew had been told about the DA40 then they would have been primed to look for it and given the

DA40 a wider berth. As it was, the GR4 crew remained unaware of the DR40 until it was overflown. The Board agreed that the lack of TI to the GR4 crew was a contributory factor.

However, in this VFR scenario in Class G airspace it was the crews involved who had the ultimate responsibility to 'see and avoid' each other's ac. Having been warned of the conflict with the GR4 by ZONE, the DA40 pilot reports seeing two military jets pass ahead of his aeroplane that were avoided by descending. This was vastly at odds with the GR4 pilot's view of the geometry of the encounter who saw the DA40 far too late and glimpsed merely a flash of a light-coloured ac just below and some 50-100ft off to starboard with no time available to take avoiding action. This suggested to other Members that the Cause was a sighting issue; the Board seemed divided on this point and a vote was taken, which by a significant majority finally resolved that the Cause was effectively, a non-sighting by the Tornado GR4 crew.

Turning to the inherent Risk, whilst occurring outwith recorded radar coverage, Boscombe Down ATC reports the radar contacts merged on their displays indicating the same level. This supported the GR4 pilot's recollection of overflying the DA40 by 100-200ft, but was at odds with the DA40 pilot's report that the two jets he saw passed 600m ahead and 900ft above as he descended to avoid them at idle power. It was only this reported avoiding action by the DA40 pilot that swayed the Board from concluding that an actual Risk of a collision existed. However, there was certainly only one jet flying in the vicinity at the time – the singleton GR4 - and the only other cct traffic was a Tutor. This suggested to some Members the DA40 pilot might be reporting a different encounter and that he might not have seen the GR4 flown by the reporting pilot at all. This anomaly could not be resolved, but it was accepted that these two ac were shown in close proximity on the Boscombe Down radar at the time with the GR4 pilot unaware of the DA40 until he overflew at high-speed, leading the Board to conclude that the safety of the ac involved had been compromised.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Effectively, a non-sighting by the Tornado GR4 crew.

Degree of Risk: B.

Contributory Factors: Lack of Traffic Information.