

whilst flying a reciprocal route inbound to Brighton, he received an ATS from Coningsby, but when released he was advised to call Humberside and not Waddington as he had requested.) Contact was not made with Coningsby until approx 10-12nm from their overhead as they were very busy with other traffic on UHF. During the interval between Humberside terminating their ATS and calling Coningsby, both crew members observed a dark coloured Dominie ac on a N'y heading about 1km away [0.54nm]. He turned R to avoid the Dominie, whose pilot also turned to the R in avoidance; the Dominie passed down their port side at an estimated range of 200m, about 200ft below his aeroplane with a 'low' Risk of collision.

The flight was continued southbound and contact established with Coningsby ATC, subsequently passing 2nm E abeam their overhead, as requested by the controller.

His DR400 has a white and blue colour-scheme; no external lighting was switched on.

UKAB Note (1): Wickenby Aerodrome is situated about 11nm NNE of Waddington and the UK AIP at AD 2-EGNW-1-3, promulgates the Wickenby ATZ as a circle radius 2nm centred on RW03/21, from the surface to 2000ft above the aerodrome elevation of 84ft. The ATZ intersects the Waddington MATZ stub, consequently at 2.22 it is noted that: flight within the ATZ above 1500ft aal is also subject to clearance from Waddington ATC.

WADDINGTON DIRECTOR (DIR) reports that he was instructing a trainee controller with up to 3 ac in the Radar Training Circuit (RTC). The Dominie was being vectored for an instrument approach to RW20 but, because of a large number of ac in transit and conducting general handling (GH), including aerobatics taking place at Wickenby up to 4000ft, the Dominie crew had been given a wide pattern out to the E. Whilst attempting to keep clear of Wickenby and other traffic in that area, TI was passed on a south-bound contact that was 2nm N of the Dominie and believed to be at a similar level. The Dominie pilot was not visual and the traffic was called again at a range of about 1nm; the pilot called visual and was instructed to turn L onto 280°, whereupon the Dominie pilot reported that he was taking avoiding action to the R and declaring an Airprox.

WADDINGTON SUPERVISOR (SUP) reports that the DIR trainee was working hard and had 2-3 ac on frequency. He passed TI on the conflicting traffic – the DR400 - and also updated it. The Dominie pilot called visual and was given a turn with that ac in sight. He then turned right to avoid the DR400 and declared the Airprox.

HQ 1GP BM SM reports that comparison of the radar replay and DIR RT tape transcript timings highlighted a significant discrepancy of about 21sec that was confirmed by engineers at the unit. Consequently, the RT transcript timings in this report have been amended to align with UTC and the radar recording time base.

DIR was manned by a mentor and trainee controller, albeit an experienced multi-tourist, whose workload was assessed as medium to high with 3 ac on frequency. Background traffic density was high and available airspace volume was reduced due to the activation of restricted airspace to the N of the aerodrome, of radius 5nm up to 9500ft agl [Scampton].

The Dominie was being vectored at 2500ft QFE (1004mb) on a wider radar pattern by DIR to avoid aerobatic ac operating from Wickenby, a local aerodrome to the NNE. At 1359:34 DIR instructed the Dominie crew to turn L onto 350° to, *“try and turn inside...traffic now manoeuvring easterly bound”* [which was not the DR400]. At this point, the DR400 was 7.6nm NNW of the Dominie indicating 3000ft Mode C (1013mb); the Dominie was indicating 2700ft Mode C (1013mb). The turn onto 350° brought the Dominie into conflict with the DR400.

CAP 774 states that:

“when providing headings/levels for the purpose of positioning and/or sequencing or as navigational assistance, the controller should take into account traffic in the immediate vicinity, so that a risk of collision is not knowingly introduced by the instructions passed.”

At 1400:13, DIR passed the Dominie crew accurate TI on the DR400 stating, “[Dominie C/S] further traffic north 4 miles south bound indicating 3 hundred feet above.” At 1400:25, an E3-D crew called DIR on climb-out from Waddington for a further RTC. At 1400:36 the Dominie crew requested an update of the TI, which was passed at 1400:41, DIR stating, “[Dominie C/S] Roger, north, 2 miles, 2 hundred feet above”. The PA responded, “visual” at 1400:45, with the PIC estimating the acquisition range as 1nm. At 1400:46, DIR replied, “roger, with that traffic in sight, turn left heading 2-7-0°.” At this point, the DR400 is in the Dominie crew’s 12 o’clock at 1.1nm indicating 200ft above it. At 1400:51 the Dominie pilot advised that they were “coming hard right” with the turn evident on radar and the DR400 0.4nm NNW of the Dominie. Although the DR400 pilot reports that they acquired the Dominie visually at a range of about 1km and turned right to avoid it, this turn is not apparent on radar.

JSP 552 201.200.3 states that:

“the Rules of the Air require that notwithstanding a flight is being made with ATC clearance, it remains the duty of the captain of an aircraft to take all possible measures to ensure that his aircraft does not collide with other aircraft...When 2 aircraft are approaching head-on or approximately so and there is a danger of collision, each shall alter its course to the right.”

CAP 774 states that:

“Whether traffic information has been passed or not, a pilot is expected to discharge his collision avoidance responsibility without assistance from the controller. If after receiving traffic information, a pilot requires deconfliction advice, an upgrade to Deconfliction Service shall be requested.”

There are a number of potential explanations for DIR’s instruction to the Dominie crew to turn onto a heading of 350°. Arguably, as a result of both the mentor’s and trainee’s level of psycho physiological arousal caused by their workload and the more imminent threat posed by the aerobatic ac, attentional tunnelling may have reduced DIR’s field of view such that they were unable to see the DR400. Alternatively, DIR may have incorrectly assessed that the turn onto 350° would not have brought the ac into conflict; however, this hypothesis is unlikely given the experience of the trainee. The more likely hypothesis is that DIR’s plan was to turn L back towards Waddington earlier than they did and before the point of conflict with the DR400.

The CPA occurred about 15½nm downwind - NNE of Waddington aerodrome; local ATC procedures state that when flown by the PA for a PAR, Dominies should be positioned for a 12nm base-leg. The time when the Dominie reached the approximate point for a 12nm base-leg, accords approximately with the transmission made by the E3-D on climb-out, followed by the Dominie crew’s request for updated TI. DIR might have planned to turn the Dominie onto a base-leg earlier, but this turn instruction was delayed by having to respond to the E3-D crew and the Dominie crew’s request for updated TI. In a subsequent conversation with the controller, DIR stated that they were conscious of how far N the Dominie had transited, which lends support to this hypothesis. On this basis, DIR did not knowingly turn the ac into conflict.

Notwithstanding the turn onto 350°, DIR provided accurate and timely TI enabling the Dominie crew to visually acquire the DR400 at a range of about 1nm. However, this might have been hampered by the reduced visibility in haze and the reportedly poor visibility from the Dominie cockpit exacerbated by the colour scheme and attitude of the DR400, presenting the all white underside of the ac and a relatively small frontal aspect.

Whilst the turn onto 350° issued by DIR to the Dominie took the ac towards the DR400, DIR did not knowingly introduce a conflict as, on the basis of the foregoing hypothesis, their plan was to turn the Dominie onto base-leg before the point of conflict.

HQ AIR (TRG) comments that the Dominie crew ultimately complied with their responsibilities to avoid a collision. It is agreed that DIR did not *knowingly* turn the Dominie into conflict with the DR400. However, the Dominie would have rolled out of the turn onto 350° and 8 seconds later received the TI at 4nm range (the turn was completed at about 1400:05, and the 4nm TI was called at 1400:13). It is not clear why a further turn was not given immediately the 'conflict' became apparent to DIR, perhaps during the turn, unless DIR did not yet consider this to be a conflict, thus bringing into question the controller's SA on the DR400. It is also disputed that the plan was to turn the Dominie earlier; even an immediate turn onto a closing heading to 12nm finals would only have produced a CPA of between 2-4nm. In addition, opportunities existed to turn the Dominie earlier despite the call by the E3-D; the turn could have been called as part of the 4nm TI or the 2nm update, so it appears that there was an intent to transit the Dominie further N, even in light of the now apparent conflict. Turning the Dominie further W in the pattern would not have contravened any of the instructions to controllers vectoring traffic in a RTC under a TS. However, it is conceivable that these instructions may have influenced DIR's decision not to issue a turn instruction once the conflict became apparent.

Equally, the Dominie crew could have chosen to take their own avoiding action earlier, but might have expected DIR to provide this avoiding action turn instead. Potential for indecision exists when crews have to constantly switch between being directed to turn to follow the pattern (and avoid traffic in the case of the turn onto 350°) and having to initiate their own traffic avoidance turns. Opting for a Deconfliction Service in this situation might have provided clearer direction from DIR resulting in greater separation, but would still not have absolved the crew from their collision avoidance responsibilities. Crews need to be prepared to take their own positive avoiding action earlier in such situations. Furthermore, more specific emphasis that traffic has been assessed as a direct conflict by the controller might alert crews earlier to the fact that a conflict exists, rather than them having to process the TI and come to that conclusion themselves.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

Whilst the DR400 pilot was in receipt of a BS there was no requirement for Humberside ATC to track it on radar or proffer TI. It was also evident from the DR400 pilot's report that he might well have called Waddington ZONE on this return flight and it was unfortunate that he had not managed to do so, which might have prompted ZONE to point out the ac to the DIR. However, at the time the Airprox occurred the DR400 pilot had not established an ATS with Coningsby and was operating VFR without the benefit of either a radar service or BS after Humberside terminated their BS. Without any prompt from radar derived TI, both the DR400 pilot and his colleague spotted the Dominie just over ½nm away and turned R to avoid it in compliance with the Rules of the Air. The Board did not consider that this was a late sighting given the head-on geometry - the DR400 pilot assessing the Risk as 'low' with separation on the Dominie reported to be 200m horizontally and about 200ft below his aeroplane. So for his part the DR400 pilot had complied with his responsibilities to 'see and avoid' other ac in Class G airspace.

At the core of this Airprox was the issue of vectoring ac under a TS within the RTC, where Members recognised that the controller was also under remit when issuing vectoring instructions to take into account traffic in the immediate vicinity so that '...a risk of collision is not knowingly introduced'. Here the mentor and trainee manning DIR had elected to turn the Dominie onto 350° to keep clear of the ac conducting aerobatics. HQ 1Gp BM SM suggested that the controllers had not spotted the conflict with the DR400 before the turn instruction to 350° was issued because, with a high level of

background traffic, they were operating under a medium to high workload and concentrating on the more imminent threat posed by the aerobatic ac at the time. Alternatively, it was contended that DIR had been aware of the DR400 and had planned to turn the Dominie on to a base leg before the ac closed, but this plan was thwarted by the E3-D calling on climb-out. Controller Members sagely argued that it was rarely wise to point one ac directly at another, and this Airprox illustrated just that. Although the recorded radar data did not replicate exactly the radar picture in use by DIR at the time, there was no reason to suppose that the DR400 was not displayed to DIR, which suggested to some Members that this was a late sighting by the controllers. After much discussion, the Board agreed that the Cause of the Airprox was that DIR had vectored the Dominie into conflict with the DR400; the Board accepted HQ 1Gp's view that in this complex scenario DIR had not been aware of the DR400 and therefore had not turned the Dominie into confliction 'knowingly'.

The Board was divided over their assessment of the Risk. Controller Members observed that DIR had passed accurate TI at 1400:13; this was a crucial transmission that had provided the first warning to the Dominie crew about the reported ac. At that stage the ac were 4nm apart and closing head on at a combined speed of 290kt. Twenty three seconds later, as soon as the interchange with the E3-D crew had finished, the Dominie crew asked for an update on the DR400. Passing TI about another ac head-on at a very similar level was potentially more urgent and Members appreciated that the updated TI crucially facilitated the Dominie crew's subsequent sighting of the DR400 at a range of just over 1nm. Some might argue that DIR had fulfilled their responsibilities with that one transmission of TI, but the Command had suggested that here was an opportunity for the controllers to be proactive and turn the Dominie L in the pattern away from the other ac rather than provide the traffic update. However, this would have placed the Dominie 'belly-up' to the 'threat' and make the DR400 more difficult to see at close quarters. Therefore, it was understandable that the Dominie crew rejected DIR's vectoring instruction to turn L onto W after they reported visual. By that stage, it was evident from the radar recording, the DR400 was just 0.4nm away and the Dominie pilot elected to take control of the ac from his assistant and robust avoiding action in the opposite direction. The Board discussed the obligations of pilots being vectored in the RTC while receiving a TS. The Air Ops fast-jet Member was clear that, notwithstanding any navigational assistance around the RTC or TI provided by ATC, pilots receiving a TS have a responsibility to see and avoid other ac.

The CPA occurred in between radar sweeps, hence the horizontal separation could not be corroborated independently. Whilst the Dominie pilot had fulfilled his responsibilities to 'see and avoid' the other ac, he estimated the separation to have been about 150m horizontally and 50-100ft vertically with a 'high' Risk of collision. This suggested to some Members that the safety of the ac had been compromised despite his avoiding action. Whilst this separation was less than that estimated by the DR400 pilot, it was of the same order of magnitude and the latter pilot's vertical estimate was spot-on from the ac's Mode C indications. The DR400 pilot reports he spotted the Dominie at a range of 1km – just 0.54nm; this was closer than the Dominie crew, who called visual at just over 1nm before they executed their R turn. Thus each pilot had seen the other ac in time to assess the situation and avoid each other's ac in-line with the Rules-of-the-Air, which convinced other Members that the pilots' combined avoiding action had effectively removed any Risk of a collision. Given the broadly equal division of the Members, the Board concluded by a majority vote that there was no Risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Dominie was vectored into conflict with the DR400.

Degree of Risk: C.