

## **AIRPROX REPORT No 2010033**

Date/Time: 26 Apr 2010 1402Z

Position: 5746N 00313W (5½nm  
FINAL RW23 Lossiemouth –  
elev 41ft)

Airspace: Lossiemouth CMATZ (Class: G)

Reporting Ac      Reporting Ac

Type: Tornado F3      Tornado GR4

Operator: HQ Air (Ops)      HQ Air (Ops)

Alt/FL: 1000ft      1500ft↓  
QFE (1017mb)      QFE (1017mb)

Weather: VMC CLOC      VMC CLOC

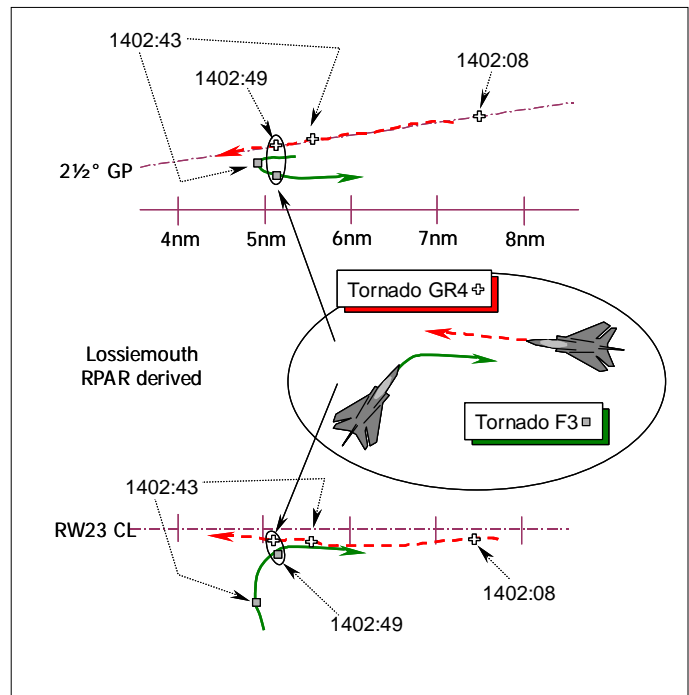
Visibility: 10km      20km

Reported Separation:

400ft V/500ft H      >200ft H

Recorded Separation:

See UKAB Note (6)



## **BOTH PILOTS FILED**

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

**THE TORNADO F3 PILOT** reports he was conducting a visual recovery [VFR] to RW23 at Lossiemouth from about 15nm SE of the aerodrome at 350kt. The SSR was selected to standby. Neither TCAS nor Mode S is fitted; his ac's AI radar was u/s.

Although requested, no TI was provided by the APPROACH (APP) controller about any other ac recovering before switching to TOWER (TWR) on 279.05MHz. Approaching the extended centreline to RW23 at 8nm, flying level at 1000ft QFE (1017mb), a standard 8nm instrument traffic call was broadcast by TWR, so he manoeuvred off of his westerly heading in an attempt to gain visual contact with the instrument traffic. Whilst in the turn he spotted a Tornado GR4 at close range – crossing from R – L about ½nm away – descending wings level on a 2½° glide-path instrument approach. To avoid the GR4 he initiated a descending RH break at about 3G. The GR4 passed about 500ft ahead with a 'high' Risk, some 400ft above his F3 after he had executed his avoiding action descent. Although the manoeuvre was not extreme he and his navigator believed that the 2 ac were on a collision course beforehand.

He added that having spoken to the GR4 pilot, the first TI received on their frequency was coincident with his own F3's avoiding action. He did not report the Airprox on RT, but subsequently contacted the ATC Supervisor by landline and reported it. His ac has a low-conspicuity, grey, air defence scheme but the white HISLs were on.

**THE CAPTAIN OF THE TORNADO GR4** reports he was conducting a pilot-pilot check from the rear-seat as the PNF and had just taken off from Lossiemouth into the radar pattern for RW23 to conduct a single-engine [SE] profile PAR under IFR in VMC. Whilst in receipt of a TS from TALKDOWN, flying level at 1500ft QFE at 8nm from touchdown, heading 230° at 300kt, the controller advised them about a 'visual joiner passing down your left hand side'. Looking L he saw an F3 at 9 o'clock in a RH descending turn belly up to his ac. Assessing the range visually as about 500ft at 'pick up', he estimated it was closer during the break manoeuvre by the F3 to a minimum horizontal separation that could have been as close as 200ft with a 'very high' Risk of a collision. He stressed that there was no time to react and take control of his GR4 to evade the other ac between his first sighting and

the F3 passing astern. There was no indication from ATC about the conflict until it was too late and he assessed that if the F3 crew had not taken evasive action a mid-air collision would have been a certainty.

The assigned SSR code was selected with Mode C; neither TCAS nor Mode S is fitted. All external lights were 'on' with HISLs on white.

**THE LOSSIEMOUTH APPROACH (APP) CONTROLLER** reports he was mentor to a trainee controller. RW23 was the duty runway; SSR was u/s and the Watchman ASR was operating without any filters selected.

The F3 was the first ac on frequency for recovery and was handed over by Scottish MILITARY for a visual recovery back to Lossiemouth. The F3 crew was given initial vectors for descent and then own navigation for the aerodrome westbound, the crew reporting visual about 8nm E. At this point the radar traffic – the GR4 - was just turning base-leg some 15-18nm from touchdown on an extended pattern, and was not considered to be a factor to the F3's visual recovery when it was switched to TOWER. There was no further liaison or communication with the F3 crew by APP; the estimated horizontal separation was ½nm.

**THE LOSSIEMOUTH TALKDOWN CONTROLLER** reports he was mentor to a trainee controller on TALKDOWN operating on 244.375MHz. The GR4 was at about 6-7nm from touchdown for a PAR to RW23 at 1500ft Clutch QFE (1017mb) when a contact appeared on the PAR screen to the GR4's L at a similar height and range. At this point the trainee pointed out the conflicting traffic to DIRECTOR (DIR) and was told that it was inbound radar - visual traffic passing down his LH side. The trainee then relayed the same message to the GR4 crew with the confliction evident in 1 plane only. As the conflicting traffic – the F3 - got closer it was slightly ahead and then turned hard R to pass astern of the GR4 on PAR. He did not offer avoiding action and reduced the displayed range at this stage to concentrate on the approach; the confliction was no longer evident. The GR4 pilot stated on RT that he wanted to speak to the F3 pilot when he landed and the talk-down was continued. The minimum separation was estimated as 100ft vertically and ½nm horizontally; the SUPERVISOR was briefed on the incident afterwards.

**THE LOSSIEMOUTH AERODROME CONTROLLER (ADC)** reports that he was mentor to a trainee controller whilst operating TWR band boxed with GROUND. The workload was low on the TWR frequency, with only one ac which had aborted a take-off, however several ac were taxiing out for departure on the GROUND (GND) frequency. Just as 2 other ac were calling ready for departure, the F3 crew called inbound for a visual join and was given the joining details for RW23 with the circuit clear. Shortly afterwards an 8½mile call was received from TALKDOWN on radar traffic – the GR4 – for a low-approach and depart the cct. The F3 crew made no further transmissions until they reported positioning behind the radar traffic, which was now inside 4nm.

[UKAB Note (1): 4 flights were under service from the combined TWR/GND position, including the F3, when the Airprox occurred.]

**THE LOSSIEMOUTH ATC SUPERVISOR** reports that SSR was u/s all day so no Mode C readout was available from any ac. When the Airprox occurred he was in the VCR due to the [expected] amount of traffic in the visual cct and the number of ac on recovery. Although not identified to him, he saw an ac orbit around the instrument traffic, which he believed was the F3 visual joiner.

When the visual cct traffic had eased, he returned to the ACR to be told by the DEPARTURES (DEPS) controller that the GR4 Captain might call when on the ground because he wasn't happy about his instrument approach. He then had a call from the F3 pilot who enquired about his visual recovery – specifically why he wasn't told about the instrument traffic when working with APP. He also stated that after he called TWR to join the visual cct he heard the broadcast 'Tornado 8 miles, low approach join'. After this he saw a GR4 on an instrument approach that was very close and he descended to avoid it.

The APP mentor said that when the F3 pilot advised that he was visual with the aerodrome they did not call the GR4 on PAR because they did not think it was a factor. He then spoke with the TALKDOWN mentor who said that they were informed by DIR that there was a visual joiner passing down the LH side of the instrument traffic. This was then relayed to the ac.

**SATCO LOSSIEMOUTH** comments that traffic information on the GR4 radar traffic was not passed to the F3 crew. At least 10nm track spacing existed between the F3 and GR4 when the F3 coasted out and APP perceived that as the F3 was expected to turn toward the IP it would not conflict with the following GR4. However, the F3 crew turned in a manner not consistent with the normal IP join expected by the APP controller, which would have been a continuing LH arc towards the IP.

No orders were in place regarding the controllers' responsibilities for a radar-visual or visual joiner. In the interim, it has been specified that visual joiners must be advised of radar traffic, and this acknowledged, before transfer to TOWER. Radar-visual joiners must be separated from instrument traffic until visual with it before transfer to TOWER. A Safety Survey [Completed 20 Aug 10] was conducted to review visual and radar-visual joining procedures.

**HQ AIR BM ATM SAFETY MANAGEMENT** reports that the point at which the F3 crew became visual with the airfield and transferred to the ADC's freq, the F3 was reported to be 8-10 miles S/SE of the aerodrome, with the GR4 to the N, at 13.5 track miles, positioning for a PAR to RW23. Although APP considered their workload to be low at the time of the occurrence, at the point at which the F3 crew reported visual with the aerodrome, APP appears busy conducting liaison on the landline.

[UKAB Note (2): At 14:00:08, the F3 crew advised, "*Lossie Approach [F3 C/S] is visual with the tower if no further traffic to effect?*" At the time of the transmission APP was liaising with TWR and DEPS to, "*call for releases*" because of the F3 that was, "*..south of the airfield at 10 miles just visual with the aerodrome now*". Without passing any further advice to the F3 crew, at 1400:22, APP instructed the F3 crew to, "[F3 C/S] *squawk standby to tower stud 2*", which was acknowledged.]

Whilst in the opinion of APP the F3's position was such that it would run well ahead of the GR4, given the F3 crew's requirement to position outside Lossiemouth town in accordance with the FOB, the track distance for both ac was actually relatively similar. Consequently, best practice suggests that APP should have warned the F3 crew of the presence of the GR4 positioning for PAR. Whilst APP's liaison/planning task might have distracted them from an effective assessment of the track distance, APP reports that they assessed the F3 would not affect the GR4's recovery.

[UKAB Note (3): At 1400:37, the F3 crew called TWR requesting to join. TWR responded 6sec later, "[F3 C/S] *Lossie Tower join runway 2-3, clutch Q-F-E 1-0-1-7 circuit clear*", the RW and QFE being read-back by the F3 crew. At 1401:50, TALKDOWN made the standard liaison call to TWR via the on-channel intercom, "*8 and a half miles [GR4 C/S] low approach and depart*". Some 10sec later TWR responded, "*say again*". A broadcast was made by the ADC on the TWR frequency at 1402:08, "*Tornado 8 miles low approach depart*", which would have been the first notification to cct traffic - the solitary F3 - of the presence of the inbound GR4 as instrument traffic. TALKDOWN made another call on intercom at 1402:17, "*7 miles [GR4 C/S] low approach depart*", which TWR immediately read-back, "*7 miles low approach depart roger TOWER*", but no further broadcast was made.]

The PAR replay shows that at 1402:39, the F3 began to paint in both azimuth and elevation and was quickly spotted by the PAR controller, with TI being sourced from DIR and passed to the GR4 crew.

[UKAB Note (4): At 1402:36, the GR4 crew was told by TALKDOWN they were, "*on glide path slightly left of centreline correcting slowly*", followed 7sec later at 1402:43 by a warning about the presence of the F3, "*5 and a half miles visual joiner on your left hand side*". The GR4 pilot reported visual 4sec later. At 1403:10, TALKDOWN made the standard clearance request to TWR via the on-channel intercom, "*4 miles [GR4 C/S] low approach*"; coincident with this message at 1403:11, the F3 crew reported to TWR, "*..[F3 C/S] is repositioning behind instrument traffic*". TWR issued the clearance to TALKDOWN for the GR4 at 1403:12, "[GR4 C/S] *cleared low approach deadside only 1*

**on** [the RW],” and added 3 sec later, “*circuit clear.*” TALKDOWN relayed a clearance to the GR4 crew at 3½ miles and after TOWER corrected the message to “1 in” at 1403:19, TALKDOWN transmitted “*..low approach deadside only 1 in* [the cct],” which the GR4 crew read-back omitting the cct state. The F3 crew then queried at 1403:21 with TWR, “*is there any other further instrument traffic to affect?*” after broadcasting “*Tornado 4 miles low approach deadside only*”, TOWER requested the F3’s “*..present position*”, which was reported at 1403:31, about 48sec after the occurrence as “*currently [5] 5 miles on the extended centre line*”. The RPAR recording shows the F3 cleared out to 7¾ nm from touchdown before turning in again towards Initials some 3nm astern of the GR4; the F3 crew reported “*initials*” at 1404:25.]

Whilst DIR could have been more proactive in telling TALKDOWN earlier of the potential presence of the F3 joining visually, this also would not have prevented the Airprox. At the point that the TI was passed to the GR4 crew, the F3 appears on the PAR replay to have reversed his left-hand turn, in keeping with the pilot’s report that he had become visual with the GR4 crew and manoeuvred to avoid what he perceived to be a conflict. Only 4sec elapsed between passing the TI to the GR4 crew and the pilot becoming visual, with a further 2sec to the CPA. This gave the PAR controller no time in which to react further to the situation and pass avoiding action to the GR4 crew.

The Supervisor reports that TWR was busy and the tape transcript broadly supports this assessment, although the only airborne ac on TWR’s frequency was the F3. [UKAB Note (5): the ADC himself reports the workload as low.] DSATCO Lossiemouth reports that ‘*..visual joining traffic often does not paint in primary [radar] once they have squawked standby and been transferred to TOWER.*’ Bearing in mind this potential weakness, best practice would suggest that as the Supervisor was in the VCR to oversee the busy departure and recovery wave, he should be visually scanning to attempt to identify the F3, to aid the ADC in his integration of this traffic with the GR4. Whilst, the Supervisor reports that he was visual with ‘*an aircraft [the F3] orbit[ing] around the instrument traffic*’, it is not clear at what point he became visual with it and no mention is made as to whether he brought this to the attention of the ADC. The absence of any information passed by the ADC about the GR4 to the F3 crew would suggest that the SUPERVISOR had not made TWR aware of the potential for conflict and indicate that the ADC had not spotted it themselves. Whilst the potential lack of radar data, as suggested by the Lossiemouth DSATCO, can be viewed as an aggravating factor in this occurrence, the lack of timely TI to the F3 crew about the GR4 indicates a breakdown of visual scan, situational awareness and CRM of both the ADC team and, critically, the SUPERVISOR. The ATC team fulfilled their duty in making the 8nm broadcast and expecting the VFR traffic to sequence themselves accordingly, best practice suggests that as much information as possible be given to the aircrew to facilitate their rejoin. The SUPERVISOR had positioned in the VCR to assist the ADC because of the reported amount of traffic in the cct and the number of departures, yet the available evidence suggests that they did not become aware of the potential for conflict until it was too late to resolve the situation. Given that the only 2 ac airborne at the time were the GR4 and the F3, it is contended that the SUPERVISOR had not developed his situational awareness sufficiently such that they could perceive this potential for conflict and as a result, the opportunity to pass TI to the F3 crew was lost.

This occurrence highlights the criticality of visual monitoring of all ac within the visual cct environment and the utility of the Highbrite VRD in aiding IFR/VFR integration. HQ Air BM ATM recommended that Lossiemouth ATC conduct a safety survey of visual joining procedures and IFR/VFR integration.

Subsequent to this Airprox Lossiemouth ATC initiated a review of visual joining procedures and IFR/VFR integration, which found that there was mixed understanding amongst ATC personnel and aircrew of visual joining procedures. It was recommended that more definitive guidance be placed within ATC and aircrew orders. As a result, a change of operating procedures proposal was raised, which has defined the visual and radar-visual approach procedures and provides clear instruction on the provision of TI by ATC to ac recovering visually.

UKAB Note (6): Analysis of the RPAR video recording suggests that at the minimum horizontal separation displayed was in the order of 300m at 1402:49, as the F3 turned R to pass astern of the GR4. Non-linear expansion of the azimuth display does not facilitate a more accurate assessment.

Vertical separation at the same point appears to have been no less than 500ft but the same caveat applies.

**HQ AIR (OPS)** comments that this Airprox may have been avoided if the F3 had been made aware of the radar traffic earlier. The situation was exacerbated by the pattern speed of the GR4 conducting a simulated SE approach which eroded the separation perceived by APP to be sufficient, APP did not call the GR4 on PAR because they did not think it was a factor, this was proven to be an incorrect assumption. Given the F3 crew's requirement to position outside Lossiemouth town in accordance with the FOB, the track distance for both ac was relatively similar and it is disappointing that this was not assimilated. Consequently, best practice suggests that APP should have warned the F3 crew of the presence of the GR4 positioning for PAR.

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

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

The HQ Air Ops fast-jet pilot Member reiterated the Command's view that this Airprox might have been avoided if the F3 had been made aware of the GR4 instrument traffic earlier. He was concerned that despite the F3 crew's request for information about any other traffic on recovery – and he stressed that these were the only two ac on recovery in the vicinity – APP did not pass TI about the GR4. Controller Members concurred that APP had an opportunity to warn the F3 crew and the controller had misjudged the potential for the two ac to fly into close quarters. The F3 had seemed well ahead at the outset and was reportedly faster, but the ATM Safety Analysis report indicated the track distance for both ac was actually relatively similar when the requirement for the F3 to remain clear of Lossiemouth town to seaward was taken into account, albeit that the absence of search radar data here did not allow the ac's track made good to be analysed at all. Military controller Members affirmed that in a normal aerodrome environment the visual cct traffic joining through the IP should avoid traffic conducting an instrument approach – see Post meeting Note below. However, APP's omission to all intents suggested that there was no other ac on recovery. Moreover this perception would have been reinforced when the F3 crew switched to TWR and was advised by the ADC that the cct was clear. Thus the crew would have had no inkling of any other ac airborne in the vicinity at the time. Whilst clearly the ultimate responsibility was on the F3 crew to 'see and avoid' other traffic whilst flying their visual recovery, the ATM Safety Analysis report reinforced the Board's view that the passing of a warning by APP to the F3 crew about the GR4 positioning for PAR was 'best practice'. Other than seeing it for themselves, the first occasion the F3 crew would have been aware of another ac close by was when the ADC broadcast the standard 8nm call – that was actually transmitted by TWR when the GR4 was at 7½nm from touchdown and barely 35sec before the Airprox occurred.

Perception of range and hence whether ac are actually in conflict can be difficult for controllers just by visual observation from the VCR and here the F3 was visible according to the SUP's account, albeit that that the ac had not been identified to him. The ATM Safety Analysis report is critical of the SUP for a lack of SA and for not giving additional support to the ADC team whilst in the VCR, but the Board did not concur with this view. Whether the poor radar coverage reported might also have affected the Highbrite VRD was unclear, but controller Members agreed with the Command's contention that the ADC might also have spotted the potential conflict earlier from the Highbrite suggesting a breakdown in the ADC's scan and SA. Moreover, the aborted take-off and traffic preparing to depart might have focused the mentor ADC's attention at the time. As it was, no information was forthcoming from ATC before the regular TWR broadcast. The Board agreed that a lack of TI about the inbound IFR GR4 was a fundamental element within the Cause of this Airprox.

Whilst executing their instrument approach, albeit under a TS, Members agreed that the GR4 crew would expect timely TI on any traffic that was likely to affect their approach and that the onus was on the F3 to avoid the instrument traffic. As it was the GR4 crew was not warned about the F3 by TALKDOWN until they were at 5½nm from touchdown, just as the Airprox occurred, when they were

advised about a “..visual joiner on your left hand side”. Thus the F3 was not acquired by the GR4 safety pilot in the rear seat until he saw it at 9 o'clock in a RH descending turn belly up to his ac some 500ft away already taking robust avoiding action. Therefore, in the Board's view, the GR4 crew was not able to affect the outcome and did not contribute to the Cause. The F3 pilot reports that when he heard the ADC's broadcast he started to manoeuvre off his westerly heading in an attempt to gain visual contact with the instrument traffic. It was whilst in the turn that he spotted the GR4 for the first time at about ½nm away crossing from R – L. It was clear that that this late sighting by the F3 crew was the other important element. Following a comprehensive debate the Board agreed that the lack of TI led to a late sighting by the F3 crew and that was the Cause of this Airprox.

Whereas the GR4 pilot estimated the horizontal separation could have been as close as 200ft within this encounter, the RPAR recording suggests the minimum horizontal separation was in the order of 300m as the F3 turned R to pass astern. Vertical separation was about 500ft at this point and in accord with that reported by the F3 pilot after he had executed his avoiding action descent, who was probably in a better position to judge the separation accurately. Although the F3 pilot reported that the Risk was 'high' and the GR4 pilot had reported there was no time to react and evade the other F3, it was clear to the pilot Members that the F3 pilot was already taking robust and effective action to resolve the conflict. Whilst some Members contended that safety had not been assured here, the majority of the Members concurred that the F3 pilot had seen the other ac in time and that his manoeuvre had been effective in removing the actual Risk of a collision.

Post meeting Note: Extract from AP3456 - The Circuit – The Join From the Initial Point.

...the IP should be approached at a height which will provide vertical clearance from radar approach traffic in that vicinity. Once the aircraft is positively established as running-in on the airfield's deadside, height and speed can be adjusted to arrive abeam the runway threshold at circuit height and at a suitable speed to commence the decelerating turn onto the downwind leg.

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

Cause: Lack of TI led to late sighting by the F3 crew.

Degree of Risk: C.