

## AIRPROX REPORT No 2011075

Date/Time: 12 Jul 2011 1346Z

Position: 5810N 00610W  
(2.5nm S Stornoway -  
elev 26ft)

Airspace: Scot FIR (Class: G)

Reporting Ac Reported Ac

Type: SF340B Tornado GR4

Operator: CAT HQ Air (Ops)

Alt/FL: 1100ft ↓ 600ft  
QNH (1025mb) RPS (1018mb)

Weather: VMC VMC

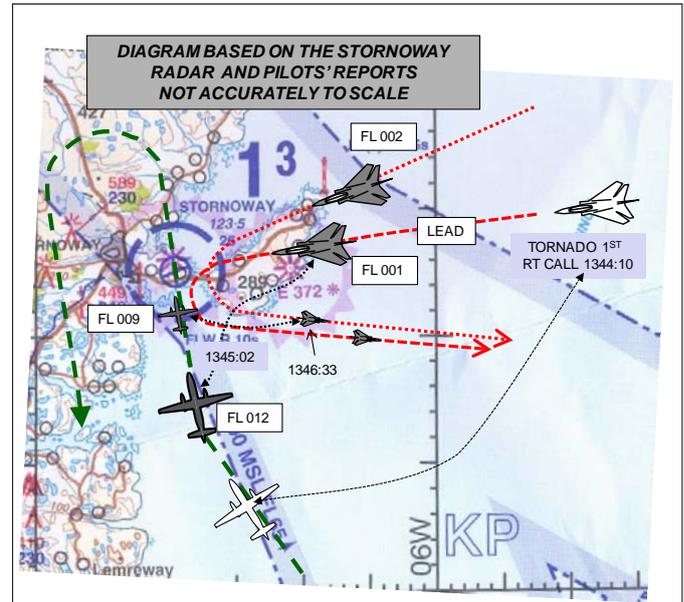
Visibility: 60km 20km

Reported Separation:

0ft V/0.5nm H 1000ft V/1.5nm (Ld)  
0 V 1.5nm H (No2)

Recorded Separation:

300ft V / 1nm H



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

**THE SF340B PILOT** reports flying a scheduled passenger flight to Stornoway in receipt of a Procedural Service (PS) from Stornoway APP and squawking 7000 with Modes C and S; TCAS was fitted. While heading 360° at 130kt on the instrument approach, 4xTornado ac called ATC to say they were E of the airfield. ATC advised them that a SF340 ac was on a visual final approach to RW36 and to remain to the E. At 1100ft on the approach they saw 2 grey Tornado ac straight ahead and coming towards them. A few sec later they had a TCAS RA climb command quickly followed by a monitor vertical speed command; the Tornado was then seen to pull up and away from them aggressively but they informed ATC they were going around due to the TCAS commands. They climbed to 2000ft and elected to turn left downwind to try and remain visual with ac and as they approached late downwind position they then saw two black Hawk ac underneath them also manoeuvring aggressively so they advised ATC of the other ac; ATC was not aware that they were there. ATC advised them to continue downwind at 2000ft until advised, which they complied with.

The military ac knew they had gone around due to TCAS RA, but still continued to attack their target (one Tornado acknowledged the fact that they had to go around).

On departure they spoke to Scottish ATC and were informed that there were in fact a total of 14 military ac close to them at the time of the incident.

He assessed the risk of collision as being high and reported the incident by radio to Stornoway APP.

UKAB Note (1): There were 4 Hawk ac engaged on the same exercise attacking another target to the SW of Stornoway. The radar recording showed them to be at low level throughout. Three min after the Airprox, while the airliner was downwind following the go-around, one of the Hawks flew 1600ft below it and another crossed 2nm ahead 1300ft below; none of the other Hawks came within 3nm of it. The second pair of Tornados conducted their attack at 1347:44 after the SF340 had gone around. Just after the Airprox there were 11 military ac within 25nm of the SF340 but the radar showed that only the 4 identified above namely 2 Hawks as above and the 2 Tornados involved came within 3nm of it.

**THE TORNADO GR4 (A) PILOT (Formation Leader)** reports that he was leading a formation consisting of 4 Tornado GR4s, tasked as part of an [large] exercise to simulate attacking a target on Stornoway airfield [exact position given – 0.2nm brg 290° from RW36 threshold].

During the planning process they were informed by the Exercise Planning Staff deployed to the Exercise base, that there were no planned movements at Stornoway during the time allocated to carry out the simulated attack.

[UKAB Note (2): A report was requested from the Exercise Planning Staff but was not forthcoming since the officer who planned that part of the Exercise has been posted overseas and was not contactable.]

The GR4 crews planned to attack in 2 pairs split by 2min 30sec and briefed the leading elements of both pairs (Tornado's A and C) to contact Stornoway APP prior to commencing the attack.

At 1344:10Z he contacted Stornoway APP; during the initial contact call he [Tornado (A) pilot] overheard the reporting SF340 being cleared to land on RW36. He then informed Stornoway of the planned attack and that the first pair of ac was 1 minute out, with the second pair following 2min 30sec later, with all ac remaining to the E **of the RW** and this was acknowledged by Stornoway APP. Immediately after Stornoway APP transmitted an area broadcast repeating the information the GR4 leader passed.

He prosecuted his attack heading 262° at 470kt and 600ft and at 1345:16Z at a point 2.1nm E of the target commenced a 4G turn to the left onto heading 110°. At 1345:35Z Tornado (A) heard on the RT that the SF340 had a TCAS RA and was going round. He was visual with the SF340 and assessed that there was no risk of collision.

At 1345:45Z he informed Tornado (B) that he (Tornado B) was clear of the SF340 and passed the information to the following pair (Tornados (C) and (D)).

All times and positions taken from ac post flight video analysis.

**THE TORNADO GR4 (B) PILOT** reports that he was the northerly ac of the pair (Tornados A and B) and was not in contact with Stornoway ATC; his leader was in contact and had informed the APP controller of the formation simulated attack plan. At 1344:52Z while he was 7.1nm from the target Tornado (B) commenced a climb from 600ft/500kt to 1500ft/460kt. At 1345Z he prosecuted the simulated attack on heading 243°. At 1345:20Z he commenced 1.5G L turn onto 083° maintaining a minimum of 1.3nm from the target [verified by the unit on the mission tapes]. At 1345:45Z his leader informed them that he was clear of the SF340. At 1345:50Z Tornado (B) confirmed in cockpit that he was visual with the SF340 and assessed no risk of collision, maintaining a min separation of 1.5nm.

UKAB Note (3): In a subsequent telephone conversation with the UKAB Secretariat, the Lead Pilot of the Tornado formation reiterated that he was pre-briefed by the Exercise Planning Staff that they had called Stornoway, who had agreed the attack and that there were no planned civil movements at the agreed time; the attack on Stornoway was co-ordinated with other ac (the Hawks) and both elements were 'on time' as given by the exercise planners. The leader also stated that his initial RT call to Stornoway was later than he would have wished; this was because immediately before the attack at Stornoway he had been engaged by a formation of fighters just to the E and was fully engaged in evading them.

UKAB Note (4): The Exercise was the subject of ACN 2011-07-0218, AL1 and an associated NOTAM as follows:

**Q)** EGPX/QWELW/IV/BO/W/000/550/5849N00331W103  
CQWI FIGHTER AREA OF RESPONSIBILITY NORTH. INTENSE AERIAL ACTIVITY  
WI AREA BOUNDED BY 5940N 00130W-5910N 00100W-5747N 00100W-5740N  
00131W-5740N 00258W-5819N 00553W-5950N 00602W-5940N 00130W. LARGE  
FORMATIONS OF FAST JET ACFT WILL CONDUCT HIGH ENERGY MANOEUVRES AND  
MAY NOT BE ABLE TO COMPLY WITH RULES OF THE AIR. NON-PARTICIPATING  
AIRCREW ARE STRONGLY ADVISED TO REMAIN CLEAR OF THIS AREA. ROUTINGS  
THROUGH THE UIR OF THIS AREA MAY BE TACTICALLY AVBL ON REQUEST  
FM PRESTWICK CONTROL OR SHANWICK OCEANIC. CTC 01309 617964 OR  
07917 506038.  
AUS 11-07-0218/AS 3  
**LOWER:** SFC  
**UPPER:** FL550  
**FROM:** 12 JUL 2011 12:15 **TO:** 12 JUL 2011 15:15 H3279/11

Although the ACN was addressed (electronically) to the Airport Operator's Head Office for onward distribution to all their aerodromes, it was not received by them and therefore was not forwarded to Stornoway, who had no knowledge of it (although they received the NOTAM). CAA AUS were unable to determine why HIAL did not receive the ACN but undertook to investigate.

**ATSI** reports that at the time of the Airprox the ac involved were in contact with Stornoway Tower/Approach (APP); the unit is not equipped with surveillance equipment. The controller described his workload as medium/high. The airport is situated in Class G airspace, with an ATZ circle of radius 2.5nm, centred on RW18/36, from surface to 2000ft aal (aerodrome elevation 26ft).

The SF340, inbound to Stornoway on an IFR flight, contacted ATC at 1335, the pilot reporting that he had copied the weather and was descending to FL85, 44nm from the airport. The controller confirmed the provision of a PS, cleared the flight direct to the Stornoway (SAY) NDB, which is situated on the airport and requested the pilot to report at 25DME; two minutes later the SF340 was cleared to FL65. Subsequently, when the pilot reported at 25 DME E of SAY a descent to 3000ft on QNH 1025mb was issued. Following a report at 19nm the SF340 was instructed to descend to alt 2000ft and the pilot was requested to report at SAY taking up the hold or visual.

At 1341:39, the SF340 pilot reported *"visual with the field request visual approach"* The flight was cleared for a visual approach to RW36 to report right base and at the time, the pilot reported passing 3300ft. Two minutes later the SF340 pilot reported on R base RW36. The radar photograph shows the ac 6.9nm SSE of the airport passing FL012 (1500ft on QNH 1025mb). Before the controller was able to reply a call was made by the pilot of one of the subject Tornados [Tornado (A)]. The radar photograph shows them to be low level about 11nm E of the airport, with a GS of initially around 500kt. (They, subsequently, maintained high speed (460kt) as they routed towards the airport.) After clearing the SF340 to land, the controller requested the Tornado pilot to pass his message and he replied, *"Two Tornados currently one minute out to the east for an attack one going through the overhead recovering to the left and you've got another pair two and a half minutes later further reattacks after that"*. The controller responded *"roger I've got a SAAB Three Forty just er joining right base er for runway Three Six"*. (The SF340 was then 5.5nm from the airport and the lead Tornado was 8nm E of the airport). The Tornado pilot replied *"Copied er our ????? plan ????? ?????? ????? cross at ????? hundred feet now ????? east of the field"*. This message was acknowledged. As can be seen above, the transmissions from the Tornado were distorted and there were several unintelligible words.

(During their investigation of the Airprox, the local ATSU believed that the Tornado pilot had stated, on initial contact, that they would not be routeing through the overhead. Additionally, in the follow up message, it is thought that he had said that they would be up at 1500ft to the E of the field).

Approximately twenty seconds later, at 1345:13, the controller transmitted *“Stornoway ????? broadcast there’s er four Tornados approaching the airfield shortly low level Stornoway out”*. (The SF340 was passing 1300ft on final approach to RW36 at 4nm and the lead Tornado was 2.5nm E.) At 1345:34, the pilot of the SF340 reported *“climbing away with a RA”*. The radar recording shows the SF340 passing 1100ft, 3.3nm S of the airport. The lead Tornado was 0.9nm SE of the airport, 2.8nm from the SF340, turning L climbing through 600ft and the second Tornado was about 2nm behind at 1400ft.

The pilot of the SF340 commented that *“those Tornados just got a wee bit too close for us”*. The controller reported *“got them both you both in sight at all times”*. The Tornado pilot confirmed he had been visual with the SF340.

The radar recordings show the leading Tornado remained over 2nm from the SF340 and at least 400ft below it, as the SF340 stopped its descent at 1000ft before climbing. At 1345:57, the second Tornado was in a L turn 1nm from the SF340, which was 2.6nm S of the airport i.e. just approaching the ATZ boundary. The former ac was at 1500ft and the latter was passing 1200ft. The SF340 climbed straight ahead to 2000ft, before positioning left hand downwind for RW36. Further military traffic was then seen in its vicinity.

The SF340 was being provided with a PS by Stornoway. This service is defined in the MATS Part 1, Section 1, Chapter 11:

‘A Procedural Service is an ATS where, in addition to the provisions of a Basic Service, the controller provides restrictions, instructions and approach clearances, which if complied with, shall achieve deconfliction minima against other ac participating in the Procedural Service’. Additionally, ‘A Procedural Service shall only be provided by controllers at ATC units with CAA approval to provide such a service. Controllers at ATC units that do not have surveillance information available may routinely apply Procedural Service to pilots of ac carrying out IFR holding, approach and/or departure procedures without the need to first elicit the pilots’ requirements. The controller shall provide traffic information, if it is considered that a confliction may exist, on ac being provided with a Basic Service and those where traffic information has been passed by another ATS unit; however, there is no requirement for deconfliction advice to be passed, and the pilot is wholly responsible for collision avoidance’.

The SF340 was carrying out a visual approach at the time of the Airprox. The MATS Part 1, Section 3, Chapter 1, states:

‘Outside controlled airspace, IFR flights in receipt of any of the UK FIS may be authorised to conduct a visual approach. Responsibility for the provision of deconfliction advice and traffic information continues to be dictated solely by the service being provided. Continued ATS provision is subject to the following: a) Procedural Service. There is no requirement for controllers to change the level of service provided’.

The Tornados were being provided with a BS, albeit the controller did not stipulate on the frequency the type of service being provided. The Stornoway section of the UK Air Pilot, Page AD 2-EGPO-1-7 states, under the title ‘Air Traffic Services Outside Controlled Airspace’:

‘During notified hours of ATC service, a procedural service will routinely be applied to IFR flights. Pilots will be expected to accept Level, Radial, Track & Time allocations that may require flight in IMC. A basic service will be routinely applied to VFR flights. A pilot may request another service if considered more appropriate’.

The MATS Part 1, Section 1, Chapter 11, defines a Basic Service:

‘A Basic Service is an ATS provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights. Basic Service relies on the pilot avoiding other traffic,

unaided by controllers. It is essential that a pilot receiving this service remains alert to the fact that, unlike a Traffic Service and a Deconfliction Service, the provider of a Basic Service is not required to monitor the flight'.

The Air Navigation Order, Rules of the Air Regulations, 'flight within aerodrome traffic zones' (Rule 45) states that:

'If the aerodrome has an air traffic control unit the commander shall obtain the permission of the air traffic control unit to enable the flight to be conducted safely within the zone'.

Although no specific permission was granted on the frequency to enter the ATZ, it was apparent to both the crews and the controller that the ac would be entering the ATZ. The controller replied to the Tornado's initial call by issuing TI about the SF340 on base leg. It is noted that the Stornoway Controller did not instruct the Tornados to remain E of the airport or clear of the RW36 approach. However, it is believed that the Tornado pilot did report that they would be staying to the E of the airport. This intention was stated in the Tornado pilot's report. The radar recordings show that both Tornados did enter the Stornoway ATZ. At the closest, one of the Tornados flew at a distance of 0.9nm from the airport but only as it was turning away. Although the Tornado did not mention visual contact with the SF340 on the frequency, his subsequent report confirms a first sighting/radar contact at 3.5nm.

As the controller considered that the SF340 was on a critical stage of flight, he decided to make a general broadcast of the position of the military traffic rather than one addressed directly to the flight. In his subsequent report, the SF340 pilot commented that ATC had alerted him to the fact that the ac would remain to the E of the airfield at all times.

Stornoway stated that they had not received any paperwork relative to the military exercise [See UKAB Note (4)]. They confirmed however that they had received a telephone call from Lossiemouth and agreed to the Tornados approaching the airfield, subject to any civil traffic. It has not been possible to confirm the estimate given about the military activity but the unit think it is possible that they arrived later than expected [See UKAB Note (3)]. The SF340 was operating in accordance with its published schedule. The controller was made aware of the proposed military activity when he took over the position.

UKAB Note (5): The recording of the Prestwick combined radar shows the incident. The SF340 approaches RW36 from the S squawking 7000 with Modes C and S, initially tracking 320° to intercept the C/L at 5nm and at FL012 (QNH 1025mb = 1560ft). Meanwhile the pair of Tornados is approaching from the E, tracking W at low-level; at 1345:03 when the SF340 is 5nm on the C/L they are in 3nm battle formation with No2 to the N and lead just ahead also 5nm out. (At 1344.10 when they commenced initial call to Stornoway APP they were 13.5nm out). The Tornados proceed inbound, leader at low level and No 2 'popping' to 1500ft. Both ac proceed inbound, leader entering the ATZ at FL003 (~600ft agl) in hard L turn onto SE. No2 also enters the ATZ at FL012 (1500ft) before also turning away to the SE passing briefly through the projected track of the SF340. The SF340 can be seen commencing a climb (from FL008) in reaction to the TCAS RA at 1345.53. The combined (processed) radar shows both the Tornado leader and No 2 following totally unpredictable tracks with severe track jitter so the Stornoway single source SSR was also reviewed. This broadly confirms the reported separation in the ATSI report above and confirms the CPA was with Tornado No2 and that the minimum separation was 300ft and 1nm. Since the radar picture is complex and differs depending on the radar source viewed the diagram above was constructed using a variety of data and reports.

Due to an e-mail problem the HQ AIR (OPS) comment was not received in time to include it.

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

Information available included reports from the pilots of both GR4s and the SF340 ac, transcripts of the relevant RT frequencies, radar recordings and reports from the appropriate ATC and operating authorities.

The HQ Air Ops Member apologised for not having provided timely comment. He informed the Board at the meeting that in his view this incident occurred because of a breakdown in communication during the planning and coordination phase of a major exercise. Further it was disappointing that the Tornado formation leader chose to continue the simulated attack profile at Stornoway despite having been informed that there was CAT traffic on approach to the airfield. A safer option would have been to call 'knock it off' and avoid the ATZ once it became apparent that the area was not, as they had been led to believe, clear of civilian traffic.

The Secretariat explained to the Board that the Exercise Planning Staff had not provided a report since the officer who planned that part of the exercise had been posted overseas. The Board agreed that although this report would have provided useful background material, in the event it had not been part of the cause of the the incident. The DAP Advisor explained that following their internal checks, the ACN had been correctly written, amended and processed. The e-mail address of HIAL had been re-checked and was the same as that used on previous occasions. That being the case, the non-receipt by HIAL could not be explained. This too, the Board agreed, although an important issue in its own right, had not contributed to the cause of the incident.

A Member familiar with airline operations in the Highlands and Islands pointed out that Stornoway is a relatively busy airport with movements throughout the day and, critically, is not radar equipped; therefore all approaches are procedural and offer no protection from non-participating traffic. With this in mind, in his view, Stornoway is not a suitable target for exercise attacks; the DAP Advisor agreed. It was pointed out, however, that this exercise (and many others) is deliberately sited in the North of Scotland to minimise nuisance and resulting complaints and there are no military airfields that can be used as targets in the West and North of Scotland. Members agreed that although the plan had correctly been to avoid civil movements and it had appeared sensible to the Tornado crews at the time, since the SF340 was operating precisely in accordance with its published schedule, the planning and coordination had not worked as intended. The Board also found it disappointing that there were apparently no records of the agreement for the attack by Stornoway ATC, or any other telephone call(s) between them and the Exercise Planners at (deployed to) Lossiemouth.

Members considered the part played by the SF340 pilots, the controller and the GR4 crews in turn.

It was agreed that the SF340 pilot had played no part in the cause of this incident; he had acted correctly and exactly as specialist Members expected. His reaction to the TCAS RA had been appropriate and the go-around was the safe option when faced with the situation presented to him. In common with the Controller, his SA had been degraded by the unclear RT sequence (i.e. whether the Tornado planned to fly through the overhead or to remain to the East of the field).

Controller Members agreed that the Stornoway APP Controller had been faced with an unenviable situation, exacerbated by his not being in possession of timely, full or accurate information about the Tornados attack or their full intentions. Part of this had been breakdowns in the information flow chain from the Exercise (mission) Planner at one end and the duty controller at the other; due to incomplete information Members were not able to establish where these breaks had occurred. From the ATSI report it appeared that the controller had not fully assimilated the Tornado pilot's message at 1344:25, "*two Tornados one minute out to the east for an attack one going through the overhead recovering to the left and you've got another pair two and a half minutes later further reattacks after that*"; the controller remained under the impression that none of the aircraft would fly overhead the airfield. He was not assisted by the next transmission from the Tornado at 1344:50 (6.1nm East of the field) which was garbled, "*copied our ?????? plan ?????? ?????? ?????? cross at ?????? hundred feet now ?????? east of the field*" was garbled. (Only following subsequent detailed analysis does it

appear that “east of the field” referred to his current position not his intentions.) The result was that the controller did not know the Tornado crews’ intended track or timing, but believed they would remain east of the field. Since he was unsure how close they would come to the Saab, he was not in a position to know whether to instruct them to remain clear to the East or alternatively to instruct the SF340 to break off its approach. A Controller Member opined that the APP controller should have displayed more positive control and instructed the Tornados to remain clear of the ATZ, if only due to his uncertainty about the safety of the situation.

Members were unanimous that, although the Lead Tornado crew were not told the SF340’s range from touchdown, as soon as they became aware of its position on right base for RW36, they should have realised that there was a potential conflict and aborted the attack for both pairs of aircraft. They should have then remained well clear and re-evaluated the situation. Further, Members considered that the No2 ac (which most likely was being flown by the supervisor) should also have been on the Stornoway APP frequency rather than on a tactical one. A Military fast-jet Member opined that even on the most important exercise or tactical check involving such an attack on any airfield, it is imperative to establish clear 2-way RT and gain a positive and unambiguous clearance for the attack profile. This will almost always involve one or more ac climbing from low level to say 1000ft in order to accomplish this. The transcript showed that Tornado leader first tried to establish communication at 1344.10; at that time the radar recording shows the ac to be commencing a left turn onto its final inbound track at FL001 (400ft) and 13.4nm out. When communication was positively established 20sec later, after the turn, the ac was at 300ft and 9.6nm; although the ac remained at 3/400ft throughout this communication sequence lasting a total of 50 sec, the (Stornoway) transcript shows the first call (starting at 1344:25) “two Tornados one minute out to the east for an attack one going through the overhead recovering to the left and you’ve got another pair two and a half minutes later further reattacks after that” to have been received clearly.

The subsequent garbled transmissions from the Tornado leader to Stornoway did not clarify the situation to the controller who responded, “(Callsign) formation in er roger”. Members agreed that the Tornado Leader thought that he had communicated his position and intentions clearly and that he had received the controller’s approval for his attack taking him through the overhead. The Controller’s broadcast (1345:13) that 4 Tornados were approaching from the east at low level would have reinforced the Lead Tornado crew’s perception that the controller had approved their entering the ATZ. Members also agreed that the controller had believed that the Tornados would remain clear of the C/L to the East of the airfield and therefore he did not need to instruct them to remain clear.

The radar recording and pilots’ reports show that Leader was first Tornado to turn towards the SF340 and he had therefore caused the TCAS RA; No2 who also turned towards the SF340 but remained about 1nm East of the C/L. Had an RA not already been enunciated, Members believed that this manoeuvre would also have generated one.

Members agreed that since both Tornados had been visual with the Saab and its pilot saw (both) the Tornados, albeit at a slightly later stage, there had been no risk of collision; this was confirmed by the SF340 pilot reacting appropriately to his TCAS RA.

Having said that, it was agreed unanimously that this had been a needless incident that could have been prevented initially by better panning and communication. Accepting these deficiencies, the incident could have been stopped in the air had either the Tornado crew aborted the attack or the APP Controller refused the Tornados permission to conduct it, as soon as the potential conflict with the airliner became apparent.

Members proposed that a recommendation be made to HQ Air to review Exercise procedures.

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

Cause: In prosecuting a simulated attack on a target inside the Stornoway ATZ, the GR4s flew close enough to the SF340 on the approach to generate a TCAS RA.

Degree of Risk: C.

Recommendation: HQ Air Command is recommended to review the planning, co-ordination and execution of simulated attacks against targets in the vicinity of civilian airfields to ensure appropriate and effective deconfliction from civilian aircraft.