

AIRPROX REPORT No 2013021

Date/Time: 23 Apr 2013 1535Z

Position: 5737N 00346W
(10nm ENE Inverness -
elev 31ft)

Airspace: Scottish FIR (Class: G)

Reporting Ac Reported Ac

Type: EMB175 2x Hawk TMk1A

Operator: CAT HQ Air (Ops)

Alt/FL: ↓4000ft 4000ft
(QNH (1011hPa)) (NK)

Weather: VMC CLBC VMC CLBC

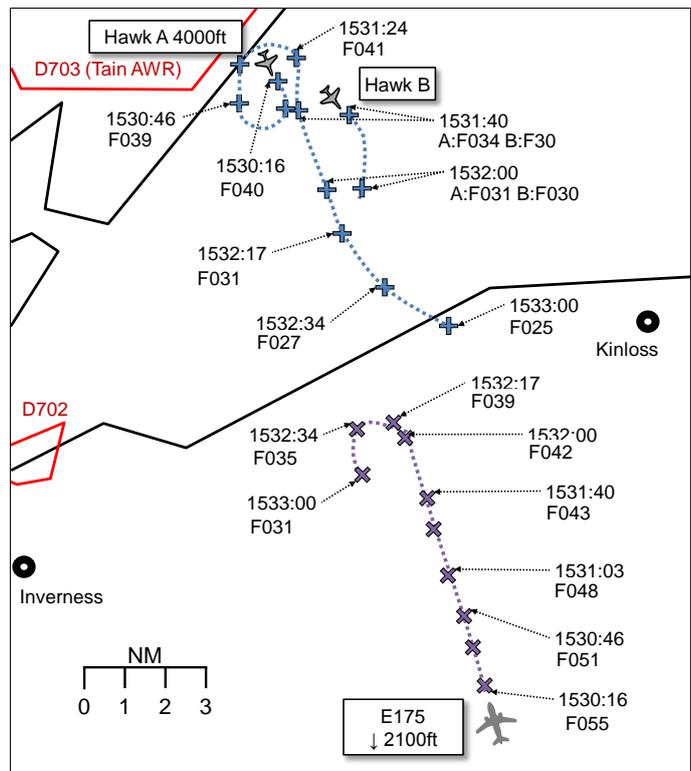
Visibility: 40km 40km

Reported Separation:

500ft V/4.2nm H 5nm H

Recorded Separation:

800ft V/3.9nm H



CONTROLLER REPORTED

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

INVERNESS RADAR (INS RAD) reports vectoring the Embraer EMB175 inbound to Inverness from the SE for an ILS on RW23 under a DS. As the ac became established on the base leg with 15nm to run he noticed a contact [Hawk A] exiting to the S of Tain Air Weapons Range (AWR). He reports that he had previously noticed similar contacts leaving and returning to the range so he warned the EMB175 pilots of their presence and elected to continue the approach and monitor the situation whilst maintaining deconfliction minima. He then noticed a second contact [Hawk B] exiting the Range and joining with the first before they started tracking S. INS Radar reports immediately passing a left avoiding action turn to the EMB175 pilots and continuing to pass avoiding action turns and a climb as the Hawks continued to manoeuvre southwards; he reports the minimum separation achieved as 4.2nm H and 500ft V.

THE EMB175 PILOT reports flying IFR at 200 kt descending through 4000ft for 2100ft on Inverness QNH 1011hPa when INS Radar informed them of traffic 12 miles to the N which had potential to conflict with them. As the ac was on a vectored heading of 355° on base leg for RW 23 the pilot reports receiving an avoiding action to turn L on to 180° and stop descent at 2100ft. The Captain used the TCS [UKAB Note 1: Touch Control Steering is activated by a button on the control yoke and has the effect of temporarily disengaging the autopilot servos allowing the pilot easily to increase the rate of turn] to expedite the turn on to 180°. Once steady the crew received instructions to climb to 4000ft so they retracted the flaps, climbed and were re-vectored for the approach without further incident. The crew did not see the other ac or receive any TCAS TAs or RAs.

THE TAIN AWR CONTROLLER (Tain Control) reports that he was monitoring 2 Hawks conducting simulated weapon profiles with Forward Air Controllers as part of a military Exercise. The 2 Hawks reported that they were egressing the Range heading 160° and he informed them of two Super Etendards holding to the S of the Range at 10,000ft on Range QFE 1011hPa. The Hawks responded that they would remain below 10,000ft and intended to descend to low level. The Range Controller reports that at 1531:14 the Hawks reported clear of the Range airspace descending to 2000ft and he instructed them to freecall Lossiemouth Approach.

THE LOSSIEMOUTH APP CONTROLLER (LOS APP) reports that he was screening a UT controller under low intensity traffic levels with only one other ac on frequency when they were informed by the Tain Range Controller that a pair of Hawks was departing the Range to the S at low level; LOS APP could see two ac departing to the S of the Range both squawking Mode 3/A 7001 and tracking towards the Inverness traffic on base leg for RW23. The Hawk formation called on the VHF frequency, APP acknowledged their call and the Hawks instructed LOS APP to “Standby”. LOS APP passed TI on the Inverness inbound to the Hawks using the phrase “*Traffic believed to be you...*” as they were not yet identified. APP updated the TI and the Hawks reported visual with the Inverness traffic and then appeared to turn towards it. On observing the EMB175’s avoiding action turn LOS APP informed the Hawks that they believed the Inverness traffic was avoiding them and suggested that a SE’erly heading would take them clear of it. APP reports that the CPA was when the Hawks passed approximately 4nm behind the EMB175 and shortly afterwards the Hawks departed low level to the S.

HAWK A PILOT reports flying as the lead of a pair of Hawks carrying out independent Close Air Support ‘*talk-ons*’ at Tain AWR with their navigation lights, HISLs and landing lights on; they were both squawking Mode 3/A 7002, to indicate range traffic, and had transponder Modes C & S selected on. The 2 ac had been operating on separate UHF frequencies in the Range and using their VHF radios [UKAB Note 2: the Hawks have only one VHF radio fitted] for intra-formation communication. The formation Leader reports that it was essential to maintain contact on VHF whilst the ac rejoined formation and completed post range checks; he established an orbit just outside the Range boundary for that purpose. As the cloud base to the S, SE and E of the Range precluded a VMC climb to avoid Inverness’ traffic pattern, he contacted LOS APP on UHF, he thought, to request a TS to assist them crossing the INS approach lane with the intent of descending towards their low level entry point 10nm SSW of Kinloss. Whilst contacting LOS APP the formation leader reports seeing a distant ac in his 1 o’clock overland to the E of Inverness which he assessed to be in excess of 5nm away as he could see the ac but could not discern the wings from the fuselage; he commenced a descent and a 30° left turn to route along the edge of the Kinloss MATZ with the intent of increasing separation from what he assessed to be a civilian ac turning through SW or W inbound to Inverness. He then recalls being informed by that the civilian ac was taking avoiding action against his formation.

ATSI reports that the Airprox occurred in Class G uncontrolled airspace, 10nm ENE of Inverness Airport.

The EMB175 was operating an IFR flight from Amsterdam to Inverness and was in receipt of a DS from INS Radar on frequency 122.600MHz.

The Hawks were operating VFR as part of a large-scale military exercise. Both aircraft had one VHF radio fitted and had formation VHF selected as they joined-up while vacating Tain AWR. The Hawks then contacted LOS APP requesting a TS on frequency 123.100MHz.

CAA ATSI had access to written reports from the pilot of the EMB175, the pilot of Hawk A, the Inverness Radar controller and the Lossiemouth APP controller. ATSI also had access to area and local radar recordings, RTF recordings and transcripts of the Inverness Radar frequency together with the unit investigation report from Inverness. CAA ATSI also interviewed INS Radar.

The Inverness METARs are provided for 1520 and 1550 UTC:

EGPE 231520Z 24023KT 9999 VCBLDU FEW012 SCT048 11/02 Q1011=
EGPE 231550Z 24023KT 9999 FEW015 SCT048 11/02 Q1011=

At 1521:36 UTC the pilot of the EMB175 contacted INS Radar descending to FL130. A DS was agreed with reduced TI due to poor radar performance and the EMB175 was instructed to descend to FL80.

The EMB175 was subsequently established on a radar heading of 340° and was given descent to altitude 3500ft. At 1530:01 the EMB175 was indicating FL056 with Hawk A on a reciprocal heading at FL039, at a range of 19.4nm.

At 1530:16 INS Radar advised, “*there is traffic just left Tain range it’s er in your twelve o’clock now at a range of one five miles indicating three thousand eight hundred feet if he doesn’t turn back for shortly I will have to turn you*”. This was acknowledged by the pilot of the EMB175.

INS Radar stated that traffic had been operating in and out of the Tain AWR all day due to the military exercise but had generally turned back before becoming an issue to Inverness traffic.

At 1530:47 Hawk A had made a 180° turn and was tracking N, back to the range and away from the EMB175. INS Radar continued to vector the EMB175 for the ILS RW23.

At 1531:03 the EMB175 was instructed to descend to altitude 2100ft.

INS Radar then noticed Hawk A and Hawk B in formation and leaving the range. There had been no co-ordination regarding the Hawks and their intentions were unknown to him.

At 1531:40 another ac contacted INS Radar but the controller did not respond to the transmission, instead instructing the EMB175 to, “*...turn left immediately heading two six zero degrees stop descent altitude three thousand feet QNH one zero one one traffic twelve o’clock seven miles opposite direction three thousand feet fast moving*”. The pilot of the EMB175 replied “*Roger heading two six zero degrees maintain three thousand feet...*”

At 1532:04 the EMB175 was at FL041 descending. Hawk A and Hawk B were in formation and were on a reciprocal heading to the EMB175 at a range of 7.1nm. Hawk A was indicating FL031.

At 1532:17 the EMB175 was on a W’ly track descending through FL039. Hawk A and Hawk B were 5.6nm NNW of the EMB175 indicating FL031. INS Radar instructed the EMB175, “*...turn left immediate heading one eight zero degrees traffic north of you four miles three thousand feet fast moving southbound*”. Prior to the controller first turning the EMB175 away from the Hawks, the Inverness Assistant contacted Tain Control in an attempt to discover the intentions of the two Hawks. By the time communication was established with Tain Control, INS Radar had turned the EMB175 away and it was discovered that the Hawks were in contact with Lossiemouth APP.

The distance between the aircraft reduced further and at 1532:34 the Hawks were indicating FL027, 3.9nm N of the EMB175 which was at FL035 (CPA). The Hawks were tracking SSE which was taking them behind the EMB175 (Figure 1).

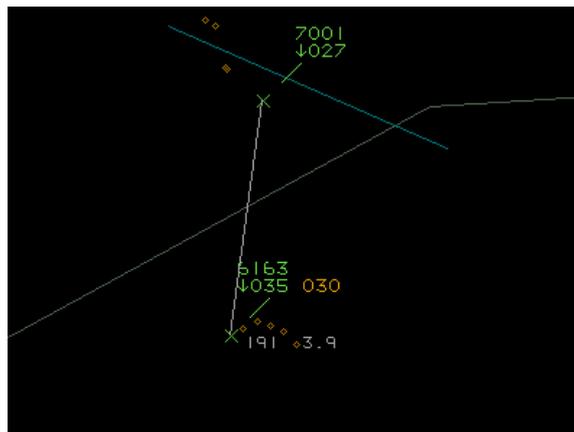


Figure 1

At 1533:00 LOS APP initiated a telephone call to INS Radar. The Inverness controller was unable to talk to LOS APP initially as he was instructing the EMB175 to turn right heading 250° and to climb to altitude 4000ft (due terrain). The TI on the Hawks was updated as being in the EMB175's, "...half past seven, range of four miles, indicating one thousand eight hundred feet". Following this transmission LOS APP advised INS Radar of the presence of the 2 Hawks and that the Hawks were visual with the EMB175 and heading 120°.

At 1534:20 INS Radar advised the EMB175 that they would be re-positioned for the ILS RW23 but that the controller was waiting for the 2 Hawks to clear the area and did not want to vector the EMB175 to the N due to the activity in the Tain AWR.

The EMB175 was subsequently re-vectorred for the ILS and landed safely without further incident.

The pilot of the EMB175 stated that there was no TCAS warning given and the crew of the EMB175 did not see the Hawks.

The report from the pilot of Hawk A stated that, after joining into a formation with Hawk B, the pilot of Hawk A contacted LOS APP on UHF. In the process of establishing a TS with LOS APP the pilot of Hawk A became aware of an aircraft 'somewhat distant' in the one o'clock position, manoeuvring. Hawk A initiated a descent to ensure increased vertical separation and also initiated a left turn to route along the edge of Kinloss MATZ and to maximise lateral separation from what appeared to be civil traffic. LOS APP subsequently advised Hawk A that the civil traffic was receiving a DS from Inverness and that avoiding action was being taken against his formation.

The report from LOS APP stated that they were informed by Tain AWR via landline that Hawk A and Hawk B were departing the range to the S low level. When Hawk A made initial contact with Lossiemouth APP, TI on the EMB175 was passed to Hawk A on the basis of "*traffic believed to be you*". The pilot of Hawk A reported visual with the EMB175 and 'appeared to turn towards' the EMB175. LOS APP observed the EMB175 make a sharp left turn that appeared to be an avoiding action turn and suggested to Hawk A that they take-up a SE'ly heading to avoid the other ac.

There is a Letter of Agreement between Inverness and RAF Lossiemouth that states that either unit being aware of aircraft routing or intending to route through the Nairn Gap (defined as that airspace roughly overhead Nairn between Inverness and the western edge of the Lossiemouth/Kinloss CMATZ, extending to 5nm N of the Moray Firth coast, to 5nm S of that coast) is to notify the other unit as appropriate. There is no such letter of agreement with Tain AWR. Figure 2 shows the positions of Hawk A (labelled Hawk 1) and the EMB175 (labelled E170) at the CPA. Hawk A is approximately 2.1nm N of the coast.



Figure 2

Highlands and Islands Airports Limited are sponsoring an Airspace Change Proposal with the intention of creating a Class D Control Zone (CTR) and Control Area (CTA) around Inverness Airport with the intention to have the Class D airspace established in the winter of 2014/15.

Analysis

Both Hawks and the EMB175 were operating in Class G airspace, where, regardless of the service being provided, pilots are ultimately responsible for their own collision avoidance. The EMB175 was being provided with a DS. CAP774, UK Flight Information Services, Chapter 4, Paragraph 6 states:

'...The deconfliction minima against uncoordinated traffic are:

5nm laterally (subject to surveillance capability and regulatory approval); or

3,000 ft vertically and, unless the SSR code indicates that the Mode C data has been verified, the surveillance returns, however presented, should not merge. Note: Mode C can be assumed to have been verified if it is associated with a deemed validated Mode A code. The Mode C data of aircraft transponding code 0000 is not to be utilised in assessing deconfliction minima).

High controller workload or RTF loading may reduce the ability of the controller to pass deconfliction advice and the timeliness of such information. Furthermore, unknown aircraft may make unpredictable or high-energy manoeuvres. Consequently, it is recognised that controllers cannot guarantee to achieve these deconfliction minima; however, they shall apply all reasonable endeavours...'

As Hawk A and Hawk B formed and tracked S again INS Radar took action with the EMB175 to avoid the Hawks, although he was delayed from doing so by another aircraft checking in on frequency as the confliction became apparent.

Although there is a Letter of Agreement between RAF Lossiemouth and Inverness in place there is no Letter of Agreement between Inverness and Tain AWR. By the time Tain Control had informed LOS APP about the Hawks and LOS APP had passed the information to INS Radar, the Inverness controller was already taking avoiding action on the EMB175. The Inverness unit investigation recommended the pursuit of a formal tri-unit letter of agreement between Inverness, RAF Lossiemouth and Tain AWR.

Conclusion

The Airprox occurred in uncontrolled Class G airspace, 10nm to the ENE of Inverness Airport. When the INS Radar controller saw the potential confliction he passed effective instructions at the earliest opportunity to the EMB175 to avoid the Hawks. The minimum distance between the EMB175 and Hawk A was 3.9nm/800ft.

BM SPA reports that the Airprox occurred at 1532:36 on 23 Apr 13 between an EMB175 and a pair of Hawk TMk1As that had departed Tain AWR. The EMB175 was operating IFR inbound to Inverness in receipt of a DS from INS APP; the Hawk Formation were operating VFR, in communication with LOS APP.

All heights/altitudes quoted are based upon SSR Mode C from the radar replay unless otherwise stated.

LOS APP was manned by a trainee and an instructor who described their workload and task complexity at the time of the incident as low; there were no other ac in receipt of an ATS from LOS APP at the time of the incident.

The incident sequence commenced at 1531:18 as one of the 2 Range Officers at Tain contacted LOS APP via landline to advise them that they, *"should be getting [Hawk Formation c/s] a pair of Hawks"*. Only one of the Hawk formation is visible on the NATS Radar Replay at this point, 13.4nm NW of the EMB175, tracking E, indicating 4100ft; the EMB175 was tracking NW, indicating descent through 4500ft. The landline liaison was completed at 1531:33, with the Hawk formation leaving Tain's freq at 1531:19.

As stated in the Hawk formation's DASOR, they were conscious that the cloudbase to the 'S, SE and E of Tain AWR precluded a VMC climb' and of their requirement to cross through the INS approach lane. Consequently, at 1531:42, the Hawk formation called LOS APP but having been instructed to, *"pass message"*, advised LOS APP at 1531:48, *"apologies, standby 10 seconds."* At this point, only one of the Hawk formation was visible on the radar replay, 10.4nm NW of the EMB175, tracking SSE'y and indicating descent through 3400ft; the EMB175 was tracking NW'y, indicating 4300ft. Shortly after, at 1531:45, the second ac within the Hawk formation becomes visible on the radar replay, 1nm E of the other ac, on a S'y hdg, indicating 3000ft; it appears reasonable to argue that this reflects the final stages of the formation's join.

The LOS APP instructor, conscious of the landline call from Tain AWR and having observed 'two 7001 squawks which had departed the range to the south, tracking south towards Inverness IFR traffic' prompted the trainee to 'call the conflicting traffic'. Immediately following the request to standby from the Hawk formation, at 1531:52, the LOS APP trainee accurately advised, *"[Hawk Formation c/s] traffic believed to be you has traffic er 12 o'clock, one-zero miles, reciprocal heading err slightly above, descending inbound to Inverness this time."* The Hawk formation did not acknowledge the TI, replying to LOS APP at 1532:02 that they were, *"North East of Inverness by 12 miles, out of Tain Range."* LOS APP trainee then re-iterated, *"[Hawk Formation c/s] Roger. Traffic believed to be you has traffic South, 5 miles, tracking north west, believed t..er.er..indicating er..700 feet below...der...700 above, descending Inverness inbound this time."* At this point, the Hawk Formation were 5.9nm NW of the EMB175, tracking SE'y indicating 3000ft, having completed their join; the EMB175 was tracking NW'y, indicating descent through 3900ft. During this transmission, at 1532:12, it is evident on the radar replay that the EMB175 had initiated a turn to the L, corresponding with the crew's report of deconfliction advice offered to them by INS APP. At 1532:24, the Hawk formation acknowledged the TI, advising LOS APP that they were, *"visual that traffic, coming left one-two-zero."* Although LOS APP reported that after the Hawk formation leader declared, *"visual that traffic"* they 'appeared to turn towards the INS traffic', this was not borne out by the radar replay and may relate to the more S'y track of the eastern Hawk as it joined with the leader.

The CPA occurred at 1532:36 as the Hawk formation adopted an E'y track, indicating descent through 2500ft, 3.9nm NNE of the EMB175, which was turning left through WSW indicating descent through 3500ft.

Whilst deconfliction minima were eroded in this occurrence, the safety barriers presented by ATM and aircrew operated successfully, ensuring that the situation did not deteriorate into a more serious incident. The Hawk formation was aware of the potential hazard posed by their flt profile to INS inbound traffic, took effective action to mitigate this and visually acquired the EMB175 at an early stage of the incident sequence. Moreover, from an ATM perspective, the teamwork between the Tain AWR and LOS APP teams was laudable and, allied to the awareness shown by the LOS APP instructor, ensured that TI was passed to the Hawk formation facilitating the development of their situational awareness.

HQ AIR(OPS) comments that the loss of separation might have been avoided if the Hawk crews had ensured they had established their Traffic Service before proceeding southwards. That said, the crews ensured they remained VMC in class G airspace, and sighted the other traffic at more than 5nm and took early and effective avoiding action, having been passed TI at about 10nm. There was no risk of collision and the DS provided to the EMB175 functioned correctly, albeit that the deconfliction criteria were not achieved because of the delay in issuing avoiding action.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of the reports from the Tain, Lossiemouth and Inverness controllers, the pilots of the EMB175 and Hawk A, the radar recordings and RT transcripts.

Several Members praised the proactive action the LOS APP instructor in prompting the UT controller to pass TI early to the Hawks. It was also noted that one of the reasons that the outcome of the Airprox was benign was that the INS RAD had been alert to the threat of an exiting Tain AWR and had passed TI early. Some ATC Advisors and Members felt that, with hindsight, if the Hawks had continued S from the Range, a 90° avoiding action turn would have been more effective in avoiding further conflict than the 180° turn that INS RAD used but it was agreed that the avoiding action had been timely and effective.

A Member asked if it would have been possible for the Hawk pilots to remain in a holding pattern until they had established an ATS but several pilot Members agreed that as they were in good VMC, had selected a route to give space to the INV approach and were maintaining a good lookout, they had acted reasonably.

It was noted that there are LoAs between Inverness and Lossiemouth and between Lossiemouth and Tain AWR but none exist between Inverness and the Range. The HQ Air (ATC) Member and the DAP Advisor reported that HQ 1 Gp was reviewing the interaction between all AWRs and their adjacent units and that the subject of LoAs would be discussed at a forthcoming meeting.

In discussing the cause of the Airprox, Members agreed that the pilots and controllers had all fulfilled their responsibilities for operations in Class G airspace and, whilst there had been a minor erosion of the desired deconfliction minima, the outcome had been benign. It was agreed that there was no risk of collision and the Risk was assessed as E.

The Board agreed that the safety barriers pertinent to this Airprox were ATC and aircrew rules and procedures, visual sighting, controller and aircrew action, situational awareness gained from RT and TCAS and compliance with a TCAS RA. It was agreed that all of the barriers had been effective with the exception of the TCAS RA, which remained in reserve with every prospect that the EMB175 crew would have reacted to it correctly had the situation become more serious. The Airprox was allocated a score of 50 on the Event Risk Classification Matrix.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in Class G airspace.

Degree of Risk: E.

ERC Score: 50.

