

## **AIRPROX REPORT No 2013054**

Date/Time: 23 Jun 2013 1255Z (Sunday)

Position: 5642N 00433W  
(N FINDO)

Airspace: UAR (Class: C)

Reporting Ac Reported Ac

Type: B747(1) B747(2)

Operator: CAT CAT

Alt/FL: FL340 FL340

Weather: IMC VMC

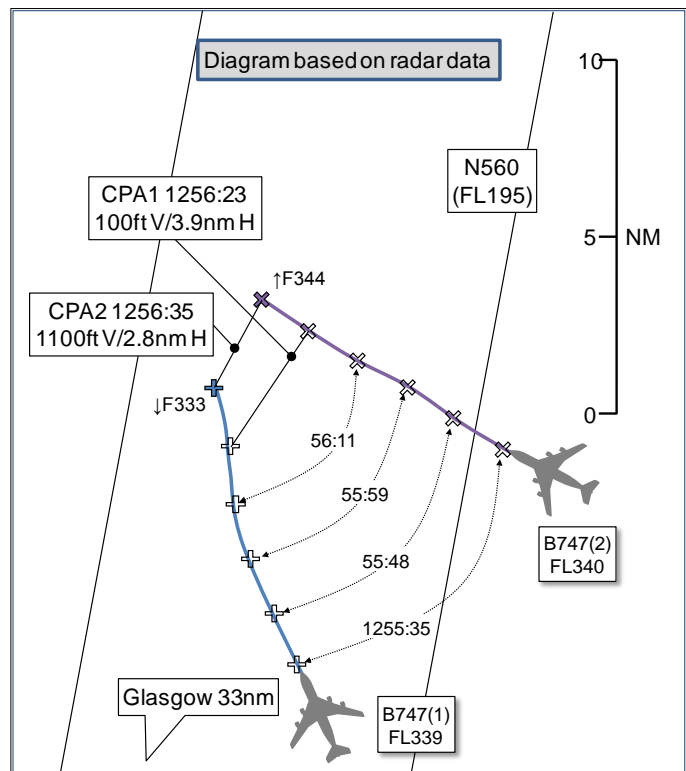
Visibility: 10km 40km

Reported Separation:

400ft V/200m H 600ft V/0.5nm H

Recorded Separation:

100ft V/3.9 nm H  
1100ft V/2.8nm H



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

**THE B747(1) PILOT** reports en-route at FL340, M.85, direct to ATSIX. He received ATC instructions for an immediate R turn, he thought, for traffic avoidance. Turn was commenced immediately and traffic observed at same level converging about 2nm distant on RH side. This ac was also given turn instruction but to the L, on to heading 270°, he thought. This combination further reduced separation and the anticipated TCAS RA occurred. A/P was disconnected and TCAS command (descent) followed. Other ac observed to follow turn instruction and then climb. ATC were advised of RA event and gave other traffic further vectors to ensure separation. FL330 was maintained, as instructed, following event.

He perceived the severity of the incident as 'High'.

**THE B747(2) PILOT** reports at M.847 in VMC at FL340, squawking Modes S and C. He was under the control of Scottish Centre. The initial heading advised by Scottish, he thought, was an immediate L turn heading 270°. The other ac was turned R heading 050°, he thought. He started the turn and, after confirmation of the heading, he was advised to turn R immediately heading 050°. He received an RA without TA in the turn, climbing to FL345. After clear of conflict A/P was re-engaged, V/S 500fpm to descend to FL340. Speed increased to the amber band and no level off at FL340. A/P had to be disconnected again to resume FL340. During this phase of flight there were no TA or RA alerts. He did not sight the other aircraft.

He perceived the severity of the incident as 'Medium'.

**THE PRESTWICK CENTRE (PC) MONTROSE T AND P CONTROLLER** reports that sector traffic was moderate but it did not seem too busy. At approximately 1250, he noticed that the two ac were coming into conflict with each other. At that time, the STCA started to activate. He gave an avoiding action L turn to the B747(1) heading 270° and B747(2) a R turn heading 050°. He observed that the B747(1) did not appear to be taking the turn. The pilot of the B747(2) queried whether he had been given a turn and he reissued it. At this point a P Controller asked if any of the ac had been given descent. He replied that no descent had been issued. He promptly instructed the B747(1) to descend. At this point the B747(2) reported a TCAS RA climb.

**THE RELIEF PC MONTROSE P CONTROLLER** reports that on arriving for work he was sent on a break and almost immediately a P was requested urgently for Montrose. He plugged in and saw STCA flashing west of FINDO, 2 ac at FL340. Avoiding action had been issued. He started trying to offer assistance and gain the picture. After a few minutes another controller arrived to relieve T. Instead, he suggested taking over the T position himself as he had more of the picture. He then handed over the P picture as best he could. The B747(1) was instructed to maintain FL330. The B747(2) was returning to FL340. Ac were released on their own navigation. He noticed that the B747(2)'s Mode C was indicating FL337 descending. Avoiding action was issued and the pilot was requested to confirm climbing. The B747(2) showed FL336 on mode C before climbing back to FL340. Mode S indicated FL340 all the time. At all times the sector was moderate to busy with numerous conflicts around Nevis, with FL340, FL350 and FL360 all having conflicts and ac reporting weather.

[UKAB Note(1): The minimum separation for ac operating in Class C airspace of the UAR is 5nm H or 1000ft V.]

**ATSI** reports that the Airprox was reported in Class C airspace, in the vicinity of FINDO, by B747(1) at FL340 following receipt of a TCAS RA against a B747(2), also at FL340.

B747(1) was operating under IFR, and was in receipt of a RCS from PC Montrose Sector [126.925MHz]. B747(2) was operating under IFR and was in receipt of a RCS from PC Montrose Sector on the same frequency.

The Montrose Sector was operating combined T and P with ATCO(1) as operational controller at the time of the Airprox. ATCO(2) provided some P assistance at the time of the Airprox before relieving ATCO(1) from position. ATCO(1) described the traffic loading at the time as moderate.

CAA ATSI had access to written reports from the pilots of both ac, area radar recordings, RTF recording and transcript of the Montrose Sector frequency, together with the PC unit report. CAA ATSI also interviewed ATCO(1) and ATCO (2) on the Montrose sector.

At 1250:40, the B747(2) pilot requested climb from FL320 to FL340 from ATCO(1). The controller replied standby and that he would call him back. The controller reported being aware that he was unable to give the B747(2) pilot a climb at that time due to other traffic and instead dealt with other issues. ATCO(1) then co-ordinated climb for the B747(2) to FL340 with the next sector and at 1251:45 ATCO(1) instructed the B747(2) pilot to climb to FL340. The B747(1) had 20.1nm to run to the Montrose sector boundary (see Figure 1 below).

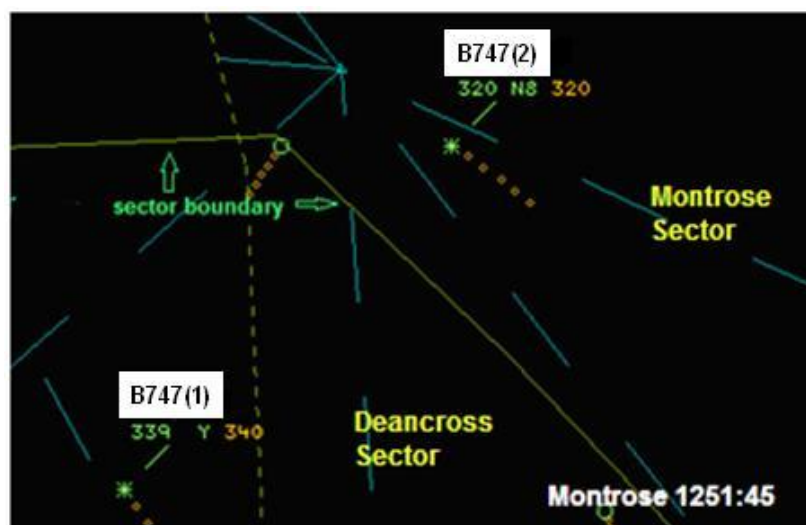


Figure 1.

At 1252:00, the B747(1) pilot contacted the Montrose sector maintaining FL340 (indicating FL339). The two ac were 24.3nm apart on converging tracks (see Figure 2 below). ATCO(1) reported that his usual method of working was to put the electronic strips of conflicting traffic together and suitably highlighted. On this occasion ATCO(1) had not done this.

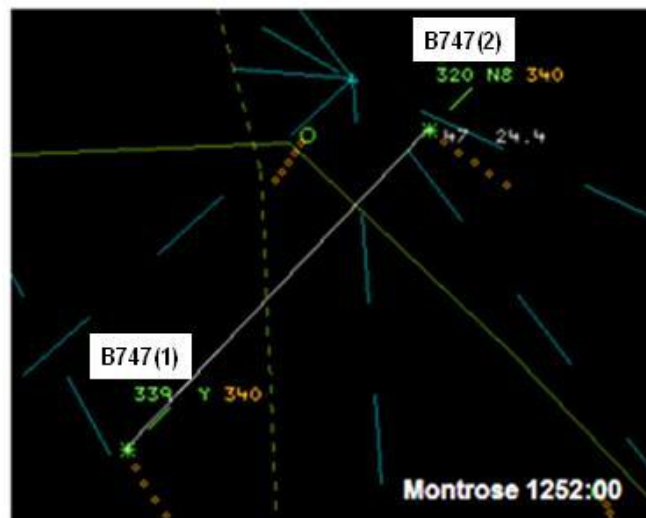


Figure 2.

At 1255:22, low-level STCA was triggered as the two ac were 9.8nm apart (see Figure 3). Just prior to this ATCO(1) had realised that the two ac were in conflict; however, he was unable to issue instructions due to another ac transmitting on the frequency. At the end of this transmission ATCO(1) transmitted, *“avoiding action [B747(1) C/S] turn left immediately heading two seven zero degrees, traffic in your right one o’clock.”* The B747(1) pilot read back, *“two seven zero [B747(1) C/S]”*. Avoiding action was then passed to the B747(2) pilot, *“[B747(2) C/S] avoiding action turn right immediately heading zero five zero degrees traffic in your left eleven o’clock”*. The B747(2) pilot replied using his C/S digits only.

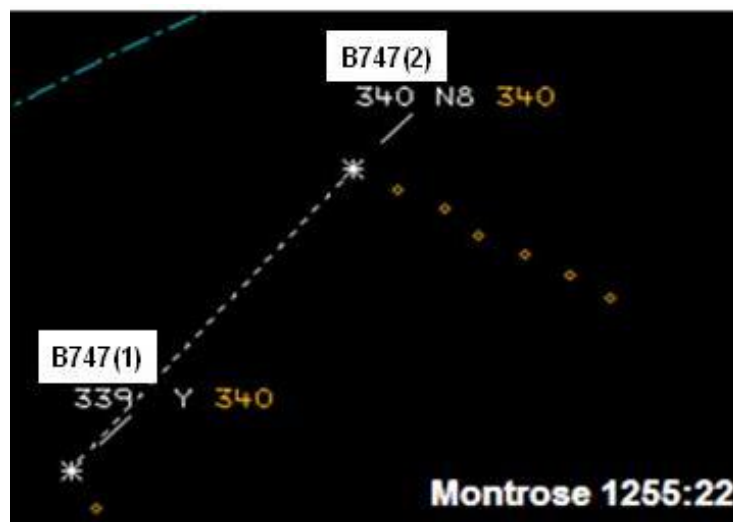


Figure 3.

At 1256:00, the two ac were 6.6nm apart still on converging headings (see Figure 4, with the headings previously given by ATCO(1) superimposed in red). The B747(2) pilot transmitted, *“and just to confirm did you give us a heading for [B747(2) C/S]”*. ATCO(1) replied, *“[B747(2) C/S] affirm avoiding action turn right immediately heading zero five zero degrees.”* The B747(2) pilot read back *“zero five zero right turn [B747(2) C/S].”*

At 1256:12, ATCO(1) transmitted to the B747(1) pilot, *“[B747(1) C/S] avoiding action turn left immediately heading two six zero degrees traffic in your right one o’clock”*. The B747(1) pilot replied

“two six zero with traffic in sight [B747(1) C/S]”. ATCO(1) was aware that he had not received a full readback but was concerned that the crew’s workload was high and did not want to distract them further.

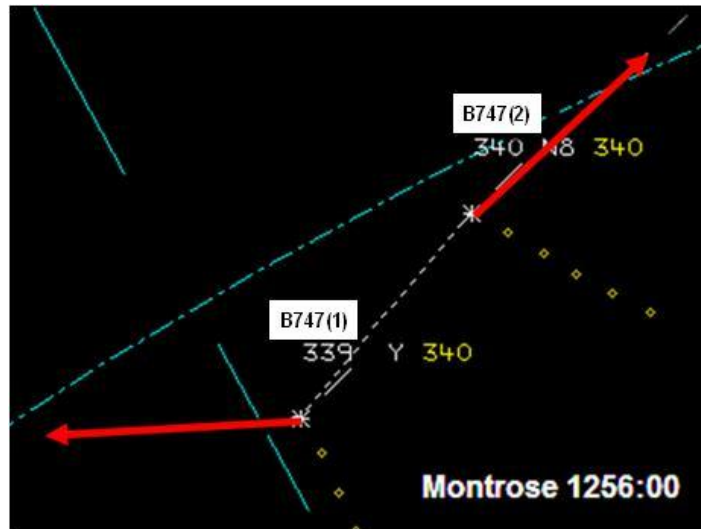


Figure 4.

ATCO(1) stated at interview that he was reluctant to give climb or descent to either ac due to his training, which discouraged it due to the possibility of giving instructions in conflict with TCAS. At 1256:17, high-level STCA alerted as separation was lost: the distance between the B747s had reduced to 4.9nm with both ac at FL340 on converging tracks (see Figure 5). The B747(1) appeared to have turned slightly R. By this time ATCO(2) had arrived on the sector to provide assistance to ATCO(1) and suggested that ATCO(1) give vertical instructions. At 1256:20, ATCO(1) instructed the B747(1) pilot to “descend now immediately”.

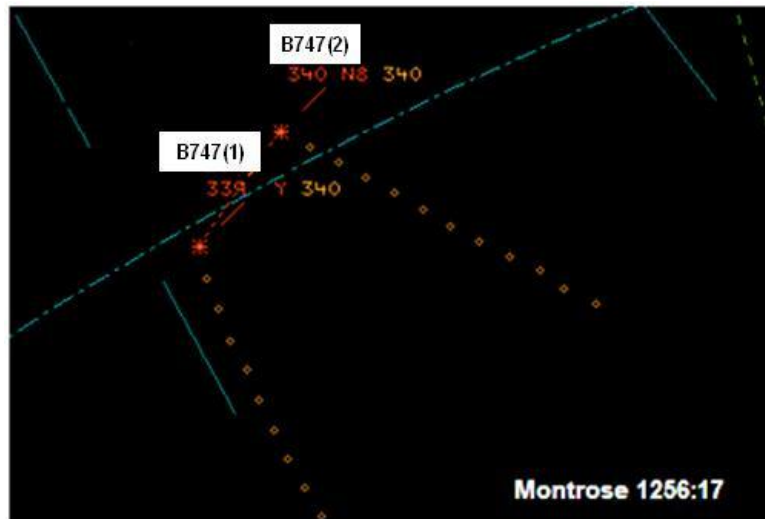


Figure 5.

The B747(2) pilot reported “resolution advisory in the climb”. This was acknowledged by ATCO(1). Separation between the two ac reduced to 3.5nm/300ft.

At 1256:37, vertical separation between the two ac was regained as B747(1) was at FL332 and B747(2) was climbing through FL344. The lateral distance was 2.8nm with the tracks of the two ac not appearing to have changed significantly (see Figure 6).

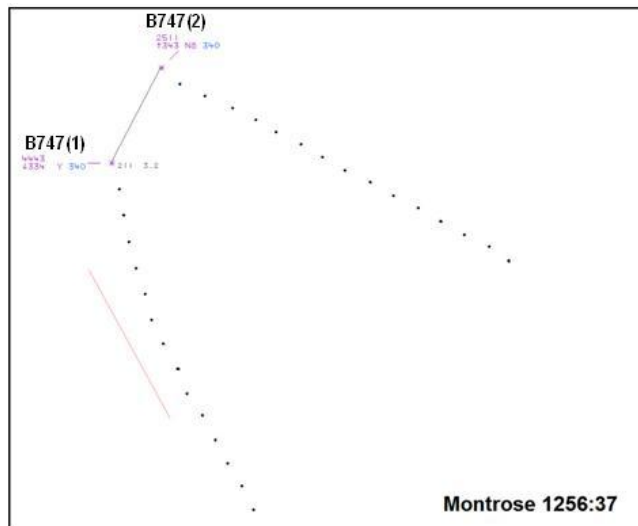


Figure 6.

The B747(1) pilot reported at FL330, and that they would be resuming FL340 in about 10nm. ATCO(1) instructed the B747(1) pilot to maintain FL330. The B747(1) pilot requested to resume the N'y heading and ATCO(1) approved this. The B747(1) pilot then advised ATCO(1) that he had received a TCAS RA before the instruction to descend.

At 1257:20, the two ac tracks crossed as the B747(1) turned onto a N'y track, passing 1.6nm behind the B748. The B747(1) was indicating FL334 with Mode S Selected Flight Level (SFL) showing FL330 and the B747(2) was indicating FL345 with SFL showing FL340.

ATCO(1) was relieved by ATCO(2), the P, who instructed the B747(2) crew to resume own navigation for ERAKA.

Although not directly relevant to this Airprox, at 1258:20, separation was again lost when B747(2)'s Mode C indicated FL338 descending and STCA activated. ATCO(2) asked the B747(2) to confirm if it was descending. B747(2) replied that they were "*getting back to flight level three four zero.*" ATCO(2) asked the crew to confirm that they were climbing to FL340. The B747(2) replied "*that's affirmative*".

At 1259:09, the Mode C indication of the B747(2) was FL335. The horizontal distance between the two ac was 2.6nm and the vertical distance was 600ft. ATCO(2) advised the crew of the B747(2) that "*we have you descending flight level three three zero*" and re-issued avoiding action, turning the B747(2) L onto a heading of 300°.

At 1259:20, B747(1) was given an avoiding action L turn on to 270°. This instruction had the potential to reduce the distance between the two ac and was queried by the B747(1) pilot. It was then cancelled by the controller as separation was regained at 1259:32, when the B747(2) levelled at FL340 and the track of the B747(1) had not changed. At interview ATCO(2) could provide no explanation for the turn given to the B747(1) except that it was the avoiding action turn issued by the previous controller and the previous incident was still on his mind.

The written report from the captain of B747(1) recollected that they received an ATC instruction for an 'immediate turn right for traffic avoidance'. The crew commenced the turn and traffic was observed at the same level converging at approximately 2nm on their RH side. They heard the other traffic be given avoiding action to the L (onto 270° they thought). The subsequent TCAS RA was followed. Following the incident the B747(1) captain contacted the B747(2) captain who confirmed that they were instructed to turn L.

The written report from the B747(2) captain stated that they were instructed to turn immediate L heading 270° and believed the other ac was to turn R heading 050°. They started the turn and then were instructed to turn immediately heading 050°. They received a TCAS RA and climbed to FL345.

Following the Airprox, PC conducted a simulation of the event where both ac acted on the avoiding action given by ATCO(1) at 1255. Rate one turns were used and the resulting minimum lateral separation was 7.2nm.

ATSI commented that ATCO(1) climbed the B747(2) to FL340, the level occupied by the B747(1) which was not yet on frequency. It is possible that as the Mode C of the B747(1) consistently displayed FL339 it did not alert ATCO(1) to the conflicting level of B747(1).

## **Summary**

Both ac were operating in Class C airspace of the UAR, under the control of the PC Montrose sector. At the time of the incident the sector was operating bandboxed P and T positions. The B747(2) pilot was instructed to climb to FL340, the same level as B747(1). Avoiding action turns were issued by the controller but were not followed by either crew. Both ac received TCAS RAs. Separation was reduced below the minimum required (5nm/1000ft).

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

Information available included reports from the pilots of both ac, 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.

The Board first discussed the ATC aspects of the incident. At the time of the Airprox both ac were operating in Class C airspace under the control of the Prestwick Centre Montrose Sector before entering Oceanic airspace. The B747(2), cruising at FL320, requested a climb to its Oceanic level of FL340 and, after appropriate co-ordination, the ac was instructed to climb to FL340. Controller members agreed that this clearance resulted in a potential confliction with B747(1), which was on a converging track, at FL340, at a range of approximately 25nm. Although a controller Member commented that it is not unusual in certain circumstances for controllers to climb ac to the same level prior to issuing further instructions, it was apparent to the Board that in doing so in this instance, the ac were placed on conflicting tracks with little distance to go before they merged. However, the Board agreed that, on subsequently identifying the potential conflict, the Montrose controller took timely action in issuing appropriate avoiding instructions to both ac. Had the pilots complied with these instructions, simulation indicated that separation would not have been lost.

The Board then turned its attention to the pilots' actions following the issue of the avoiding instructions. It was apparent that both crews had taken each others' instructions, and the Board found it hard to determine why this had occurred; unfortunately no Human Factor report was available from either crew. The Board was surprised that all four pilots had misheard or misinterpreted the avoiding action instructions despite at least one of the crews reading them back correctly. One airline pilot Member wondered if there could have been callsign confusion; this was discounted because they were not similar, nor could they have been confused with heading information - ATSI confirmed that the transmissions were clear on the RT recording. Having discounted this, the Board considered other potential causes of confusion. It was possible that the crews may have been distracted because this would have been about the time that they would have been receiving their Oceanic clearances on data-link. Another possibility mooted by an airline-pilot Member was that, having settled into their trans-Atlantic routine, it was unusual for pilots to be issued with avoiding action instructions at that altitude and location. Expecting only routine information to be transmitted at that time, they may have been perplexed by the avoiding action information and instinctively responded without properly assimilating it. He also noted that, during simulation training, avoiding action was only practiced as a result of a TCAS alerts, and not as a result of ATC instructions; this was an important consideration as to their potential familiarity with receiving, assimilating and actioning such RT instructions in a timely manner.

The next question that concerned the Board was the action of the B747(1) pilot ,who had turned his ac towards the B747(2). From the information available, it was unclear whether the B747(1) pilot had had B747(2) in sight before or after he turned. Irrespective, a controller Member was disappointed that, contrary to requirements, the B747(1) pilot did not advise ATC that he was reacting to a TCAS RA once it had activated; he considered that the absence of this important information would affect controllers' actions in such situations.

In considering the cause of the Airprox, the Board agreed that there were two issues involved; namely the actions of both the controller and the pilots. There was a prolonged discussion as to whether the controller's actions were part of the cause or were a contributory factor. Bearing in mind that his subsequent recovery actions, if taken, would have resolved the conflict, it was decided that they were a contributory factor. The Board considered that the pilots' actions, by flying each other's avoiding action ATC instructions, caused the Airprox. As to the risk, because B747(1) had B747(2) in sight as it was turning towards it, and both ac reacted to TCAS RAs thereby establishing standard vertical separation by a horizontal distance of 2.8nm, the Board opined that there was no risk of a collision.

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

<u>Cause:</u>	The pilots of ac on converging tracks flew into conflict because, although they acknowledged timely avoiding action, they did not follow it.
<u>Contributory Factor(s):</u>	The Montrose T & P climbed the ac to the same level.
<u>Degree of risk:</u>	C.
<u>ERC Score:</u>	102.