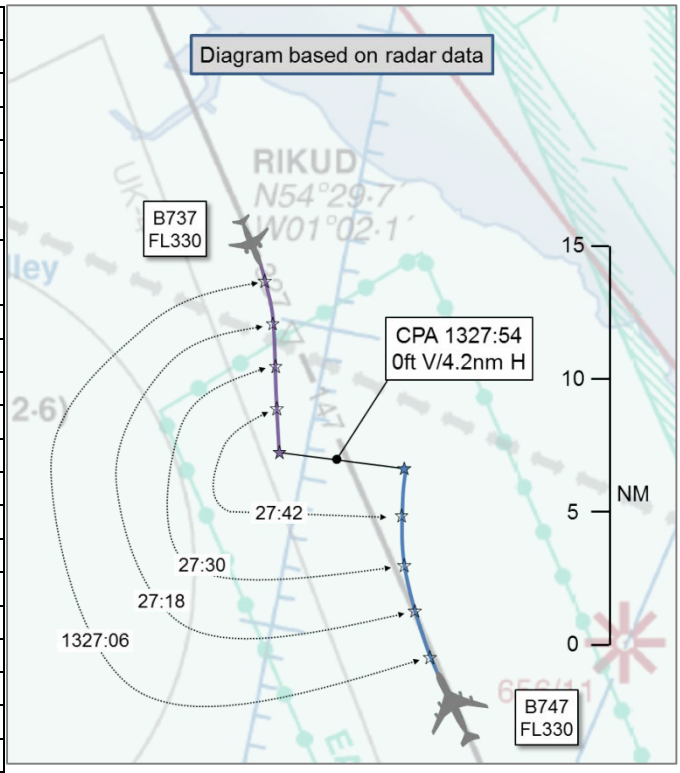
AIRPROX REPORT No 2015134

Date: 29 Jul 2015 Time: 1328Z Position: 5426N 00058W Location: 17nm ESE Newcastle

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	B737	B747
Operator	CAT	CAT
Airspace	UAR	UAR
Class	C	C
Rules	IFR	IFR
Service	Radar Control	Radar Control
Provider	Montrose Sector	Montrose Sector
Altitude/FL	FL330	FL330
Transponder	A,C,S	A,C,S
Reported		
Colours	Grey/red	White/blue
Lighting	Strobes, nav	NK
Conditions	VMC	VMC
Visibility	>10km	'good'
Altitude/FL	FL330	FL330
Heading	NK	NK
Speed	NK	NK
ACAS/TAS	TCAS II	TCAS II
Alert	TA	Nil
Separation		
Reported	NK	NK
Recorded	0ft V/4.2nm H	



THE BOEING 737 PILOT reports that their first indication of the other traffic was a TCAS TA. They received a heading change from ATC then the TCAS TA activated, which was followed by a further heading change. They both sighted the B747 banking away abeam them. The situation was unknown to them until it had developed to that stage. The actual breakdown in separation was notified to their company's Flight Safety department because a report was filed by NATS. He commented that the controller was calm and professional throughout, and this probably ensured a feeling that all was under control.

He assessed the risk of collision as 'Low'.

THE BOEING 747 PILOT reports that they were in cruise-flight at their cleared FL. They noticed TCAS opposite-direction traffic at the same level. At the same time, the radar controller instructed a heading turn to the right, which they reacted to without delay. This heading change was flown with bank limit (normal for cruise-flight high altitude). Shortly afterwards they received a second heading change with the instruction 'immediate'. The second turn was flown without bank limit, because the instruction was 'immediate'. From their perspective they did not judge the situation as dangerous because no TCAS TA or RA was received.

He assessed the risk of collision as 'None'.

THE MONTROSE SECTOR TACTICAL/PLANNER CONTROLLER reports that the pilot of the B747, on transfer from Swanwick Sector 4, had requested a climb to FL340. Because there was slower traffic ahead already at FL340, he coordinated the B747 to only FL330 with the Deancross Sector. When the coordination was accepted, he instructed the B747 pilot to climb to FL330. He did not assimilate that the B737 also at FL330 was opposite direction traffic to the B747. When the initial Short Term Conflict Alert (STCA) activated, he turned both aircraft right. When the turns did not

appear to provide sufficient separation between the 2 aircraft he gave avoiding action to the B747 pilot by turning the aircraft right heading 090°.

Factual Background

The standard separation that the controller was required to achieve between the two aircraft was 1000ft vertical and/or 5nm horizontal.

Analysis and Investigation

CAA ATSI

ATSI had access to reports from the controller, both pilots and the ATS unit investigation report, together with area radar recordings, RTF and a transcript of the unit position frequency. The ATSU investigation included screen grabs from the electronic flight data display used by controllers at Prestwick ACC (PC). Screenshots produced in the report are provided using the area radar recordings. Levels indicated are Flight Levels. All times UTC.

The Montrose Sector controller received the electronic flight progress strip (EFPS) for the B747 at 1313:08. At 1313:20, the strip was placed at the top of the display for that area, with the B737's EFPS 3 strips below. At 1313:29, the controller coordinated a clearance to climb the B737 to FL330 which was passed to the B737 pilot at 1314:15.

At 1325:15, the B737 was southeast bound, level at FL330 with the B747 north-west bound, 41.7nm southeast of the B737 at FL320 (see Figure 1). The B747 pilot requested a climb to FL340, but due to other conflicting traffic was only cleared to FL330.

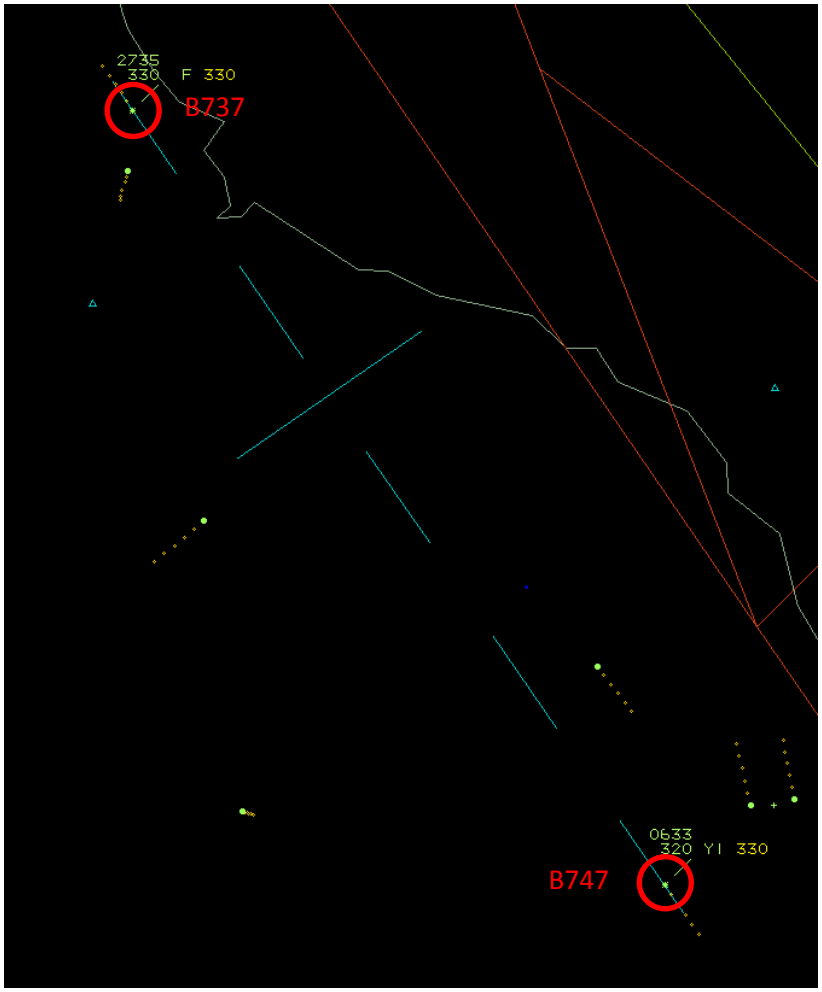


Figure 1: 1325:15, B737 squawk 2735, B747 squawk 0633

At 1326:19, the B747 levelled-off at FL330, with both aircraft now 25nm apart (see Figure 2).

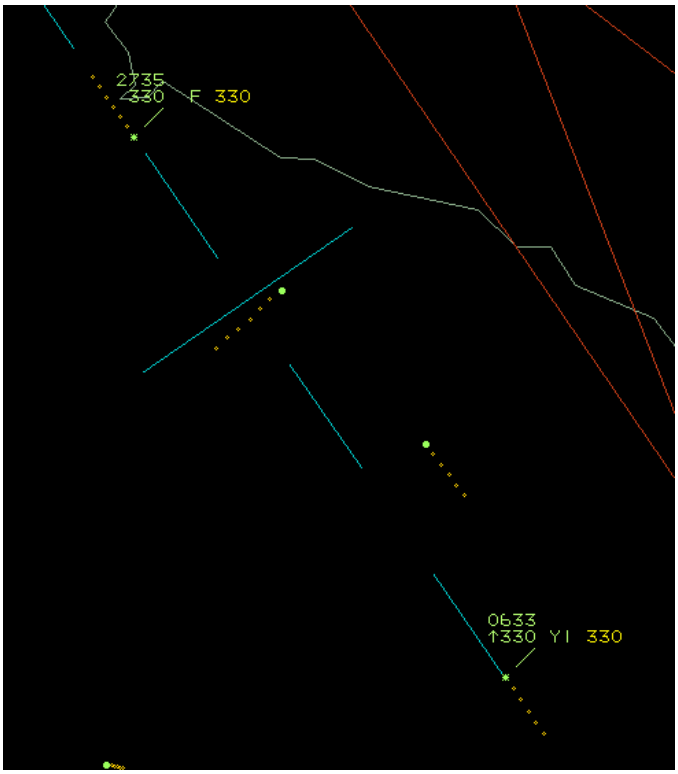


Figure 2: 1326:19

At 1326:39, a Low Level STCA appeared on the controller's display (see Figure 3).

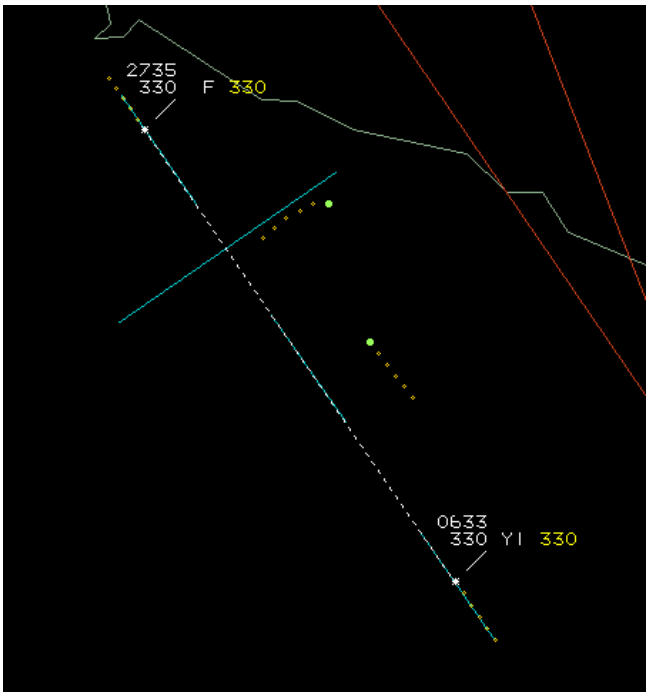


Figure 3: 1326:39

The controller immediately issued an instruction to the B737 pilot to turn right 20°, which he acknowledged and reported back as a heading of 167°. The controller then instructed the B747 pilot to "*turn right immediately twenty degrees please*" which was acknowledged by the pilot. At 1327:10, the controller issued a further turn instruction to the B737 pilot onto a heading of 170°.

Another pilot called on frequency which was ignored by the controller who, following the initiation of High Level STCA on his display at 1327:20 (see Figure 4), issued an avoiding action right turn to the B747 pilot, on to a heading of 090°, with the B737 10.7nm ahead, which was observed to be commencing a right turn.

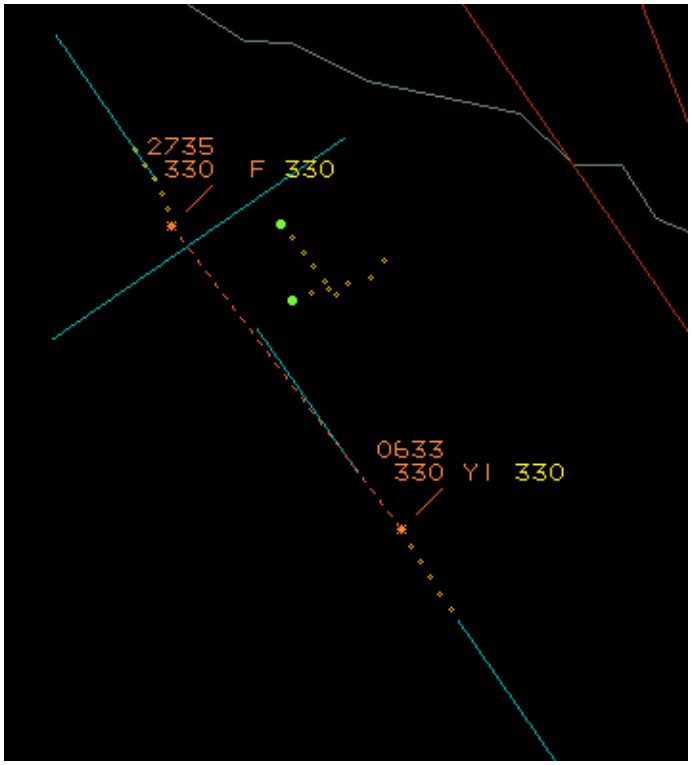


Figure 4: 1327:20

At 1327:25, the STCA was downgraded to a Low Level alert (see Figure 5).

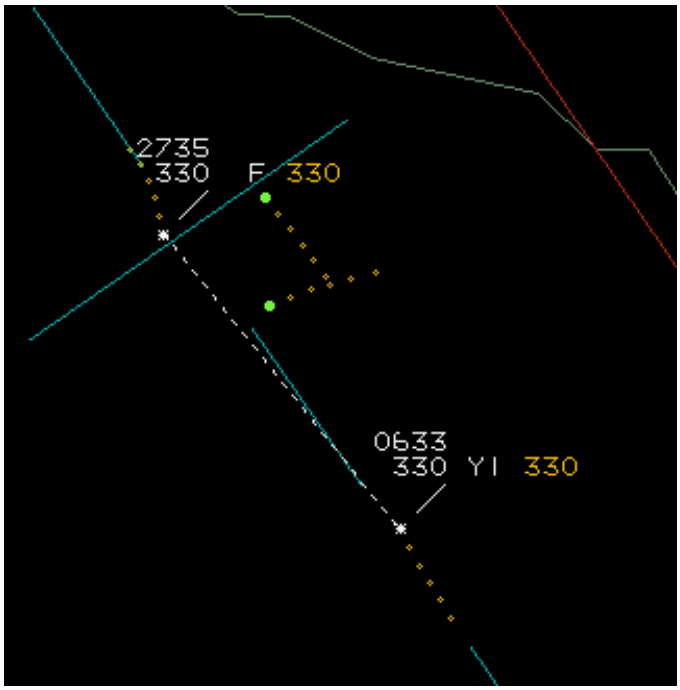


Figure 5: 1327:25

At 1327:40, the controller instructed the B737 pilot to turn right again onto a heading of 190°.

CPA was at 1327:55 with the aircraft separated by 4.2nm with both aircraft at the same level (see Figure 6).

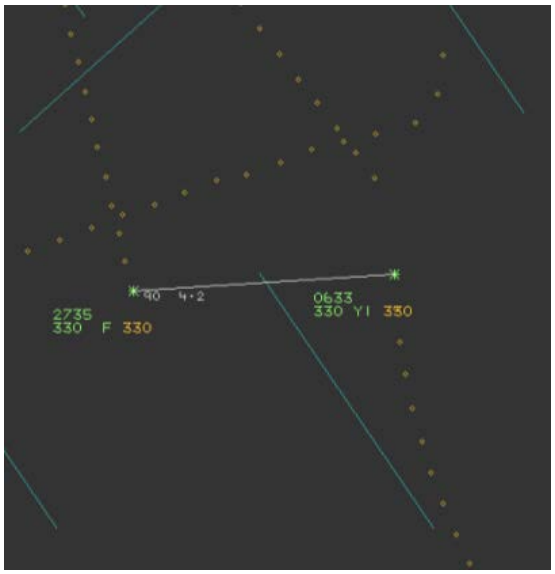


Figure 6: 1327:55.

Traffic levels and complexity were assessed as moderate to high. The controller had only recently taken over the position and was operating combined Tactical/Planner but with support available if required. The confliction remained undetected from the time the EFPS was received at 1313:08 until the Low Level STCA at 1326:39.

The controller acknowledged in the ATSU investigation interview that the clearance to the B747 pilot did not take into account the opposite direction B737 at FL330, which was visible both on the flight data display and on the radar display as well. He could not explain why he did not spot the confliction.

The initial action by the controller to turn both pilots right 20° was slow to be implemented due to the momentum of both aircraft, and so the controller issued two further corrections to the B737 pilot, one of only 3° and then ultimately another 20° turn. Only the B747 pilot was given an 'avoiding action' turn, onto a heading of 090°. No Traffic Information was passed to either pilot.

Although the controller was highly experienced, he had only completed 32 minutes on this sector within the previous 34 days as a result of being on the Limited Operational Register (LOR). The controller had not worked an operational radar position for the previous 5 days. Controllers are normally placed on the LOR and not assigned to a watch when involved on non-operational duties. Additionally, the roster worked by the controller had not been following a particular pattern because he had been involved in a project trialling new procedures and equipment. The new equipment included a system called Medium Term Conflict Detection, (MTCD) which displayed projected conflictions, something not available to controllers in the operations room. Guidance had been issued to controllers involved in the project, reminding them of the need for visual scanning of the radar and EFPSs for identifying potential conflictions when returning to operational duties from the project.

When asked if he had considered climbing or descending either aircraft instead of issuing turn instructions, the controller stated in the ATSU investigation interview that avoiding action in the horizontal plane was always his first thought due to 'the possibility of any TCAS alert that works in the vertical plane'.

The pilot reports indicated that the B737 received a TCAS TA, but the B747 received no alert. The ATSU investigation concluded that the controller should have called for support to split the position.

UKAB Secretariat

The controller was required to achieve standard separation and, in attempting to do so, instructed both pilots to turn right. Notwithstanding that they were under radar control, the B737 and B747 pilots ultimately shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard[1]. Because the incident geometry is considered to be head-on or nearly so, if the pilots had been aware of each other then both were required to turn to the right[2].

Summary

An Airprox was reported when a B737 and a B747 flew into proximity at 1328 on Wednesday 29th July 2015. Both pilots were operating under IFR in VMC and were in receipt of a Radar Control Service from the PC Montrose Sector. The controller issued a climb clearance to the B747 pilot which did not take into account an opposite-direction B737 at the same level. The actions of the controller following the Low Level STCA ensured there was no risk of collision, although they were not sufficient to ensure that standard separation was maintained. The CPA was recorded as 4.2nm horizontal with both aircraft at the same level. Without vertical separation of 1000ft the required horizontal separation was 5nm.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from both pilots, the controller concerned, area radar and RTF recordings and reports from the appropriate ATC and operating authorities.

The Board first discussed the actions of the Montrose controller and quickly agreed that the root cause of the incident was that he had not assimilated the conflict with the B737 when he had cleared the B747 to climb. All the information about the B737 and the B747 was present on the Sector, both on the radar and the EFPS displays and there was no apparent reason why the controller had overlooked the presence of the B737 when clearing the B747 pilot to climb to the same level.

However, this was an experienced controller, and the Board wondered what the Human Factors were behind the incident that might explain this lapse. A Civil ATC member with experience of the Prestwick Centre observed that, at the time of the Airprox, the controller was performing both the Tactical and Planner roles and, with hindsight, in view of the workload, he considered that it would have been prudent to have split the Sector. Members also noted that the controller had been engaged on operating a trial prior to the introduction of a Medium Term Conflict Detection (MTCD) system at the Unit. Not only had this meant that he had not been regularly carrying out live operational duties, (completing 32 minutes on the sector in the previous 34 days) but also that the mechanisation of the trial system was fundamentally different to the live operation in that the MTCD system pro-actively warned of conflicts of the nature experienced in this incident. Board members wondered whether the combination of not working regularly on the Sector, and previously operating a system which provided confliction advice, could explain why the experienced controller had overlooked the presence of the B737 when he had cleared the B747 pilot to the same level. It had not been possible to determine locally whether this had been a causal issue and, although the controller had reported that he had not considered it to be relevant (as far as he was concerned it had been a 'slip' on his part), members wondered whether there had been a cognitive failure attributable at least in part to the controller's recent working patterns. The Board wondered whether there was any help provided to the controllers when they returned to operational duties after carrying out trials. The ATC member and the NATS advisor explained that there is guidance reminding controllers of the need to scan the radar and EFPSs for identifying potential conflictions; controllers are encouraged to study the guidance for at least 10 minutes before commencing work back on the operational sector. Notwithstanding, the Board wondered whether any practical 'return to ops' simulator training might be

[1] SERA.3205 Proximity.
[2] SERA.3210 Right-of-way (c) (1) Approaching head-on.

appropriate after such a long period away, which might simulate such conflicts in order to reinforce the reading material.

The Board discussed the actions of the controller when he had been alerted to the conflict by the STCA. He had issued both pilots avoiding action turn instructions of 20° and some Civil ATC members were surprised that the controller had issued only that degree of turn to both pilots. As far as they were concerned a heading change of at least 30° would have been recognised as being more appropriate. Additionally, he had not initially used the term 'avoiding action' and then only subsequently to the B747 pilot; they considered that if the controller had issued a heading change of at least 30° and used the term 'avoiding action' then the required separation of 5nm horizontally would probably have been achieved.

The Board then discussed the comments made by the B747 pilot about making the heading change with 'bank limit'. A Civil Airline Pilot member with piloting experience of the B747 commented that there was always a bank limit during auto-pilot turns; it was simply that an artificial extra restriction could be applied in some modes if appropriate. In his opinion, it is preferable, for safety reasons, to use automatic rather than manual turns when operating at high level due to the potential for exceeding performance limits at high all-up weights. He commented that, taking into account aircraft speed and turn performance, any heading change in reaction to an avoiding action turn would always be slower at high-level compared to operating at lower levels, for example in a holding pattern.

The Board quickly agreed that the Airprox occurred because the Montrose controller cleared the B747 pilot to climb into conflict with the B737. Notwithstanding, in addressing the risk, the Board agreed that there had not been a risk of a collision because timely and effective action had been taken which had resulted in the aircraft passing 4.2nm apart horizontally. The Board therefore agreed that the Airprox should be categorised as risk Category C.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The Montrose controller cleared the B747 pilot to climb into conflict with the B737.

Degree of Risk: C.