

## AIRPROX REPORT No 2010123

Date/Time: 2 Sep 2010 0615Z

Position: 5503N 00502W (5nm  
SSW TUNSO)

Airspace: AWY P600 (Class: D)

Reporting Ac Reported Ac

Type: A319 ATR72

Operator: CAT CAT

Alt/FL: FL140 ↓FL150

Weather: VMC NR VMC NR

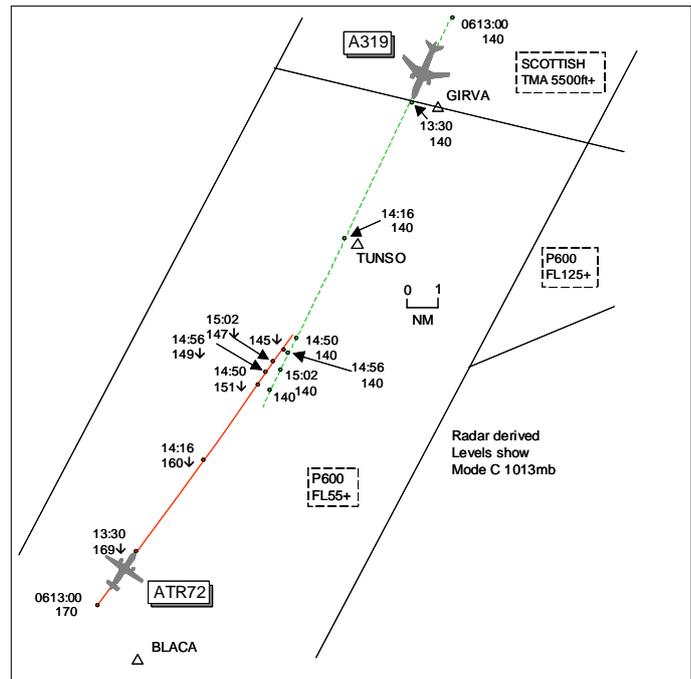
Visibility: NR NR

Reported Separation:

400ft V NR

Recorded Separation:

700ft V/0-3nm H



## PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

**THE A319 PILOT** reports cruising at FL140 en-route to Belfast IFR and in receipt of a RCS from ScACC on 123-775MHz, squawking with Modes S and C. ATC advised them of opposite direction traffic that had been cleared to descend to FL150; visual contact was made with an ATR 15nm ahead. A TCAS TA occurred as the ATR passed O/H as it had descended to +800ft of their level, before a TCAS RA 'monitor v/s' was received before 'clear of conflict' soon followed with no level deviation. Their TCAS showed the ATR to be behind them when it stopped its descent +400ft above their level. ATC checked with the ATR crew for their cleared level and told them of their 'level bust'. ATC was informed of their TCAS RA and they replied that a report had been filed. Visual contact was maintained continuously until the ATR passed O/H and he assessed the risk as high.

**THE ATR72 PILOT** reports en-route to Edinburgh, IFR and approaching TUNSO, having been cleared from FL170 to FL150 when ready, to be level by TUNSO. He, the Capt and PF, should have set the new cleared level on the altitude display unit (ADU) [MCP] straight away but instead he put FL150 into the GNSS [FMC] to work out the descent profile and missed the ADU. He thought a radio call to another ac just before their descent call distracted him, as he believed this other ac was also routing towards TUNSO and was given the same level restriction they were expecting. They remained at FL170 for another few miles until he initiated descent by selecting VS mode and a ROD of 1200fpm, before increasing this to around 1800-2000fpm as they approached TUNSO. Whilst descending ATC told them to maintain FL150 on reaching as an A319 was cleared to 1000ft below their cleared level in the opposite direction. Both he and the FO looked out and watched the A319 pass by and then TCAS sounded "traffic traffic". He looked back in at the altimeter and noticed his error simultaneously as an RA 'adjust v/s' was received. He corrected their flightpath to regain their correct cleared level. They were able to make visual contact with the A319 as soon as the controller had told them to expect to see it and they remained in visual contact with the A319 throughout the whole incident. He opined that had they adhered better to their SOPs the 'level bust' could have been avoided. He believes that a significant factor was tiredness/fatigue as he had been on 4 very early starts in a row, before 0500, and had flown 80 odd sectors in the previous month; his FO had had a similar workload. He subsequently completed a level bust survey, which was included with his report.

**THE ANTRIM SECTOR CONTROLLER (SC)** reports the ATR72 flight was given descent to FL150 with TI on opposite direction A319 at FL140 whose crew was also given TI on the ATR. STCA

activated when the ATR was descending through FL147 and, after the ac passed, he saw the ATR descend to FL144. No avoiding action was given as the ac were passing each other as STCA activated.

**NATS PRESTWICK UNIT INVESTIGATIONS** reports the Airprox occurred when the ATR72 flight, having been issued with descent clearance to FL150 and which was correctly read back, passed through its cleared level by 600ft.

The ATR72 flight first called the Antrim SC at 0553:15 climbing to FL150 and was advised of the landing RW at Edinburgh. The standard route is ROTEV – GOTNA – BLACA – TUNSO – TLA for a TWEED arrival. The Antrim Sector was then handed over and was then controlled by a single controller operating as the Tactical and Planner. At 0609:40 the ATR72 was issued with descent to meet the standing agreement between Antrim sector and the adjacent Galloway sector, *“ATR72 c/s when ready descend flight level one five zero level by TUNSO”* which was read back correctly. At 0611:15 the A319 flight called on its own navigation for BLACA as per the agreement with the Galloway Sector. About 2 min later at 0613:14 the Antrim SC passed TI to the ATR72 flight, *“ATR72 c/s maintain flight level one five zero on reaching there is opposite direction ‘A319 company’ one thousand feet beneath your cleared level”*. The ATR72 crew replied *“Okay we’ll maintain flight level one five zero on reaching ATR72 c/s”*. The SC then transmitted, *“A319 c/s when ready descend flight level one hundred”* which was read back correctly. Immediately after this the SC gave TI to the A319 flight, *“A319 c/s you might see opposite direction traffic on TCAS shortly he’s descending to one thousand feet above your current level”* to which the crew replied, *“Ah looking for traffic A319 c/s”*.

At 0614:59, as the ac were about to pass, Antrim SC transmitted, *“ATR72 c/s contact Scottish Control on one two one decimal three seven five”*, which was correctly read back. During this exchange at 0615:01 separation was lost as the ATR72 descended through FL148 before 2sec later at 0615:03 STCA activated as a low severity alert (white) with separation 700ft and 0.4nm [the ac have crossed]. Four seconds later at 0615:07 STCA changed to a high severity alert (red) with 500ft and 1.1nm separation, the SC then transmitted, *“ATR72 c/s just confirm your cleared level flight level one five zero”*. The ATR72 crew replied, *“We’re just ???????? (unclear but sounds like “maintaining”) flight level one five zero now ATR72 c/s”*. Meanwhile at 0615:11 STCA changed back to low severity alert (400ft/1.4nm) before ceasing at 0615:16. The ATR72’s Mode C shows FL142 at 0615:19 before indicating a climb; standard separation was regained at 0615:31. The A319 crew then transmitted, *“and A319 c/s we got an RA off that ATR72 company”*; the SC replied, *“A319 c/s roger I will have to file he did uh bust his level”*. The SC then called the ATR72, *“and ATR72 c/s you did uh break ah go through your level, flight level one four five at the minute”*. The ATR crew replied, *“That’s copied just correcting on a bit of a glitch in the system here”*.

[UKAB Note (1): The CPA occurs between radar sweeps. The radar recording at 0614:56 shows the ATR descending through FL149 in the A319’s 1 o’clock range 0.9nm whilst the next sweep 6sec later at 0615:02 shows the ac having passed starboard to starboard separated by 0.4nm, the ATR72 descending through FL147, 700ft above the A319 and in its 4 o’clock. The CPA is estimated to be 0.3nm and at least 700ft vertically.]

The Antrim SC was operating on his first morning shift of a 6-day cycle. The shift commenced at 0600 but he had plugged in on sector about 10min earlier. The Sector was described as moderately busy; a Planner was available but the radar controller did not feel it was necessary for the sector to be split. The controller stated that STCA triggered during the transfer of the ATR72 to the next sector. The data blocks were garbling and he was unable to read the levels. He then noticed the ATR72’s Mode C indicating FL148 and although this was not a level deviation he chose to question the crew immediately but chose not to offer avoiding action as the targets were already diverging. The radar recording shows that separation was lost for 30sec but for 28sec the tracks were diverging.

When the descent clearance was issued to the ATR72, the Mode S SFL did not change from the displayed FL170. The initial investigation revealed that where an ac is being flown manually it is unlikely that the SFL will change to reflect the cleared level. The SC did not notice the discrepancy between Mode S and the flight’s cleared level. His perception is that Mode S on certain ac types is

unreliable and in some others it is missing completely. He thought that, in hindsight, the lack of Mode S information may have triggered something but in all likelihood he would have just considered the SFL readout to be unserviceable; the controller was aware of the phraseology relating to SFL. The SC had correctly issued the level change and monitored the read back, which was all that was required. The MATS Part 2 MOPS Section 4.3.1.6 Policy for the use of SFL states:

‘When available from suitably equipped aircraft, the SFL will be permanently displayed on the radar display.

Although the checking of SFL is not a mandatory task for controllers, it is encouraged for early identification of possible level busts.

The display of SFL is not a substitute for RT read back, which remains a mandatory controller task.

The SFL will be automatically removed from the Target Label on final approach.

Phraseology when SFL is observed to be at variance with an ATC clearance states:

‘Under these circumstances, controllers must not refer to the incorrect SFL observed on the radar display and must avoid debate over the RTF. Where controllers choose to query the discrepancy, the phraseology which should be used is:

*“Callsign... check selected flight level. Cleared level is Flight Level/Altitude (number)”*

During this event there were at least 2 other flights within the sector that had been given similar levels and routes to TUNSO but both flights were on a similar track to the ATR72 and ahead.

**ATSI** endorsed the findings of the Prestwick Unit Report (APX-64618). In addition to the allocation of safe clearances to both ac the Antrim controller also chose to give TI about the respective ac 1000ft above and below.

In addition, the non-standard behaviour of the Mode S Selected Flight Level (SFL) on the controller's situation display was highlighted to other unit controllers in the form of an Incident Brief, which was disseminated shortly after the incident. Standard phraseology is available for controllers to use when a challenge of Mode S information is appropriate (CAP493 Manual of Air Traffic Services Part 1, Appendix E (Attach) Page 14, 11 March 2010, refers).

The unit report also recommends the review of airspace 'hot spots', where similar occurrences might be likely. This has been accepted by unit management and the ATSD En-Route Inspectorate will monitor the progress of the recommendation as required.

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

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

Experienced CAT Members pointed out that the statement in the NATS Unit Investigations report regarding the SFL not reflecting the cleared level when an ac is being hand flown was incorrect. As shown in this case, the SFL displayed was not the ATR72's cleared level because the crew had not set FL150 in the MCP. The ATR72 was being flown using the v/s Mode of the AP but the functionality of SFL would have been no different if the ATR72 was being flown manually. It was clear to CAT Members that had SOPs been followed the AP would have captured the cleared level. Although the ATR72 Capt believed he had become distracted when the level change instruction was received, Members wondered why normal CRM cross-checking had not picked up this MCP/SFL anomaly. Furthermore, there should have been further cross checking as the flight descended with 1000ft to go checks as the ac approached its cleared level of FL150. It appeared the ATR72 crew were both looking out for the opposite direction A319, following good 'defensive' controlling by the Antrim SC when he passed TI to both flights, and they had watched the A319 pass below. In doing so the ATR72 crew descended below their cleared level and into conflict with the A319, which caused

the Airprox. Separation was then lost as they crossed which then triggered the safety nets of STCA and TCAS. TCAS TAs and RAs were briefly generated which alerted the ATR72 crew to their error and caused the A319 crew some concern as they had watched the ATR pass 800ft above and then continue its descent before establishing into a climb back to FL150. With both crews' visual sightings and the ac rapidly diverging after they had crossed the Board agreed that any risk of collision risk had been effectively removed.

Members noted that the Antrim SC had not noticed the SFL/cleared level discrepancy but were surprised by his perception regarding the reliability and/or missing of SFL. A CAT Member informed the Board that whilst there is a known SFL transmission problem within a certain ac type in the UK leading to the SFL being missing, the problem is being addressed and there is no fundamental issue with the accuracy or reliability of Mode S equipment. Controller Members, familiar with LTC operations, informed the Board that checking of SFLs was 'modus operandi' since its introduction and querying of the SFL with crews, if it did not change when a flight was instructed to change level, was second nature.

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

Cause: The ATR72 crew descended below their cleared level and into conflict with the A319.

Degree of Risk: C.