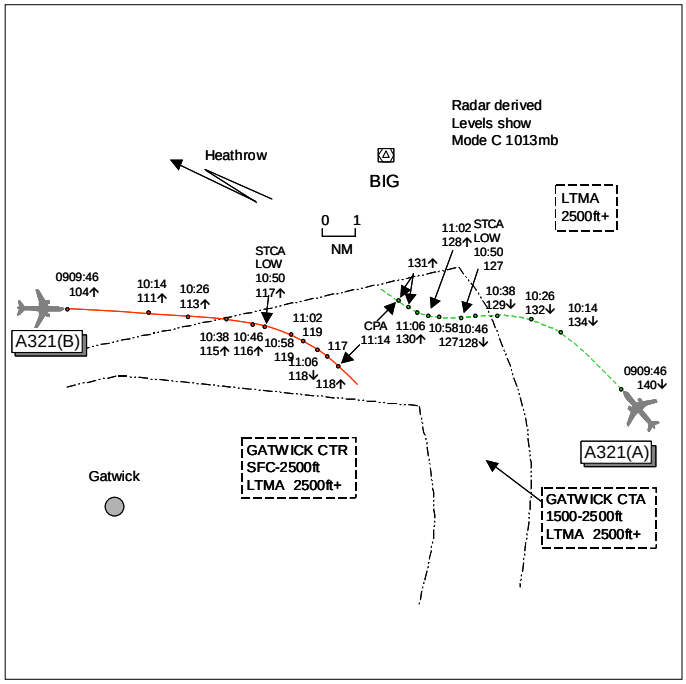
AIRPROX REPORT No 2010073

Date/Time: 28 May 2010 0911Z

Position: 5114N 00001E (6nm S BIG)

Airspace:	LTMA	(*Class: A*)
	Reporting Ac	*Reported Ac*
Type:	A321(A)	A321(B)
Operator:	CAT	CAT
Alt/FL:	↓FL100	FL118↑
Weather:	IMC	VMC CLOC
Visibility:	NR	10nm
Reported Separation:	800ft V/NR H	800ft V/10nm H
Recorded Separation:	1300ft V/2·8nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE A321(A) PILOT reports inbound to Heathrow IFR on radar heading 270° descending to FL100. ATC issued heading of 330° and then a 'stop decent now' before TCAS generated an RA 'climb' demanding >1000fpm. The RA guidance was followed and the other ac passed with an estimated separation of 800ft vertically and he assessed the risk as low.

THE A321(B) PILOT reports outbound from Heathrow IFR heading 085° at 310kt and climbing to FL170. Passing FL118 they received a TCAS TA followed by an RA 'descend' before ATC issued 'stop climb FL120 turn R heading 180°. The RA guidance was followed and the turn was commenced, the other ac was not seen visually but passed ahead and to their L by an estimated 800ft vertically and 10nm laterally. He assessed the risk as none.

THE LTC BIG CONTROLLER reports A321(B) was following a DVR SID and was on a radar heading to pass behind the A321(A), which was inbound to BIG and had already been transferred to Heathrow INT. A321(A) made an unexpected L turn before reaching BIG whilst descending through about FL140; this placed the ac head-on. A321(B) was passing FL114 and was instructed to turn R heading 180° and stop climb FL120. Separation was maintained but the A321(B) crew reported a TCAS RA

THE LTC HEATHROW INT reports the A321(A) flight called on frequency descending to FL80 and was instructed to leave BIG heading 270°. After a few seconds it became apparent that the crew had taken the heading of 270° straight away, which placed the ac in conflict with the climbing A321(B) which was working TMA S. According to the Mode S information A321(B) was going to climb through the A321(A)'s level, so he gave avoiding action to A321(A); no separation was lost. Later when listening to the RT replay neither his UCE, Safety Manager or himself were able to tell whether the A321(A) crew had read back their initial clearance correctly. It wasn't apparent whether he had used an abbreviated read back of 'Biggin 270' or 'heading 270'.

ATSI reports that the Airprox occurred on 28 May 2010 involving A321(A) inbound to the BIG VOR for an arrival at London Heathrow and A321(B) on a DVR4G departure from London Heathrow; the Airprox occurred approximately 3nm S of BIG VOR at FL120.

The A321(A) flight called the LTC BIG frequency (120·525MHz) at 0904:50 (UTC). The BIG sector was manned by a single controller and was bandboxed with the LTC TIMBA sector. A321(A) was passing FL190 for FL150 - in accordance with the Standing Agreement between LAC S17 and the BIG sector - and had approximately 39nm to run until BIG. Replay determined that the ac was 'own navigation', routeing TIGER – BIG, although this was not mentioned on the RT.

The A321(B) flight, a departure from London Heathrow RW27L, called the BIG frequency at 0906:13, passing altitude 2800ft for altitude 5000ft. The flight was instructed to squawk ident and at 0907:07 BIG instructed A321(B) to, "*climb flight level eight zero*". The flight was then instructed to continue on its present heading, the heading was 140°. At 0908:27 A321(B) was instructed to, "*climb flight level one seven zero*", and this was read-back correctly. Immediately after issuing this instruction BIG cleared A321(A) to descend to FL100, which was also read-back correctly. FL100 was the release level to INT as there was a Category A flight operating at FL090 in the vicinity of OCK and BIG VORs.

At 0909:10 A321(B) was instructed to turn L on to a heading of 095°. The BIG controller's next transmission, at 0909:17, was to A321(A) to, "*contact Heathrow 119·72* [sic]". At this time the ac was passing FL147 in the descent.

ATSI Note (1)- MATS Part 1 Appendix E (Attach) Page 6 para 3.4.5 states 'All six figures shall be used when identifying frequencies irrespective of whether they are 25KHz or 8·33KHz spaced' therefore the correct identification of the frequency for Heathrow INT is 119·725.

Between 0908:48 and 0909:30, whilst A321(B) was below FL100, the ac was observed to climb at a rate of between 3000 and 4000fpm, speed 250kt. However, on passing FL100, the ac's speed began to increase and the rate of climb dropped to between 1000 and 2000fpm.

A321(A) flight called the LTC Heathrow INT (N) frequency (119·725 MHz) at 0909:48 stating, *"A321(A) c/s down flight level one hundred*". INT was operating as both the INT N and INT S controller at the time. INT instructed A321(A) to, *"leave Biggin heading two seven zero degrees*". The A321(A) pilot replied, "*heading two seven zero degrees A321(A) c/s*".

At 0910:14 A321(A) commenced a LH turn into A321(B)'s 12 o'clock at a range of 13·4nm. A321(A) was passing FL134 in the descent and A321(B) was passing FL111 in the climb.

At 0910:16 BIG adjusted the heading of A321(B) R onto a heading of 105°. Immediately after the pilot's read-back, at 0910:25, BIG instructed A321(B) to "*make a right hand turn now heading one eight zero degrees*". After the pilot's read-back BIG instructed A321(B) to, "*stop your climb flight level one two zero*". The pilot read-back the amended level and re-iterated the R turn onto 180°.

At 0910:38 INT instructed A321(A) to "*turn right heading three three zero degrees avoiding action*". This was read-back by the A321(A) pilot. INT then instructed A321(A) to, "*stop descent*". By 0910:46, the ac were on reciprocal tracks, in each other's 12 o'clock at a range of 6·9nm, A321(A) was passing FL128 (SFL100) and A321(B) was passing FL116, SFL still indicating FL170.

Low-Level STCA activated at 0910:49. Mode S downlinked RA messages indicate that A321(B) received a 'Descend' RA at 0910:50 and at 0910:52 A321(A) received a 'Climb' RA.

[UKAB Note (1): The radar recording at 0910:50 shows A321(A) levelling-off at FL127 with A321(B) climbing through FL117 and commencing a R turn.]

At 0910:58 INT transmitted to A321(A): "*just confirm it's avoiding action right heading three three zero degrees*". [UKAB Note (2): Minimum vertical separation of 800ft occurs at this time with the ac 4·6nm apart, with both ac in level flight, A321(A) at FL127 and A321(B) at FL119.]

At 0911:01 High-Level STCA activated. At the same time the R turn of A321(B) began to take effect with the ac at FL119, SFL now indicating FL120. A321(A) was still tracking W and now climbing through FL128, SFL indicating FL100.

[UKAB Note (3): The next sweep at 0911:06 reveals A321(A)'s R turn beginning to take effect with the ac climbing through FL130 with A321(B) descending through FL118. Four seconds later the ac close to 3nm with A321(A) passing FL131 with A321(B) level at FL117. The CPA occurs on the next radar sweep at 0911:14 with the ac passing port to port separated by 2·8nm, A321 (A) showing FL131 with A321(B) climbing through FL118.]

The required minimum separation in LTMA airspace is 3nm horizontally or 1000ft vertically.

At 0911:16 BIG instructed A321(B) to turn L onto a heading of 085°. After reading-back the new heading the pilot stated that, "*we had a TCAS descent now coming back flight level one two zero*". BIG acknowledged this and then cleared the flight for further climb to FL170. Shortly after A321(B) was transferred to LAC S15.

At 0911:17 INT instructed A321(A) to descend to FL100. After reading-back the clearance the pilot informed the LL INT controller, "*we had a TCAS RA*". This was acknowledged by INT and A321(A) was then vectored for an arrival to RW27R.

It is standard practice on the BIGGIN sector to instruct W'ly DVR departures to fly a SE'ly heading to enable climb through ac descending into the BIG VOR hold. The departures can then be turned back towards DVR when separation against the inbound traffic is assured, either by vectoring so the departure goes behind the inbound, or a level change has been achieved.

As A321(B) was passing FL085, with a slow speed and high ROC, BIG turned the departure onto a heading of 095°, which was in front of the arriving A321(A)'s trajectory as it passed through FL148. This was a solution that required the controller to monitor the flight paths of the departure and arrival as separation was not assured until a level change had been achieved.

The pilot of A321(A) incorrectly read back the 'leave BIG heading 270 degrees' instruction issued by INT as 'heading 270' and this was not detected by the controller. A321(A) then turned head-on to A321(B). At this point the high ROC of the departure had decreased as its speed increased.

When both controllers assimilated the ensuing situation neither used the correct form of avoiding action phraseology, which is: "(callsign) Avoiding Action. Turn/Climb immediately (instruction) (traffic information)" – MATS Part 1 Appendix E (Attach) page 11.

A321(B)'s turn onto 180° was not seen to take effect until 36sec after the instruction had been given and A321(A)'s turn took 29sec to take effect. In addition INT instructed A321(A) to, "stop descent" without specifying a level; this is non-standard phraseology.

Both ac received complementary RAs at approximately 0910:50, which was after they had been given turn instructions. However, neither pilot announced on the RT that they were responding to a TCAS RA until the encounter was over.

ATSI Note (2): The UK AIP ENR 1.1.1 Para 5.6.6 states 'A pilot who has deviated from an air traffic control instruction or clearance in response to an RA shall: a) As soon as possible, as permitted by flight deck workload, notify the appropriate ATC unit of the RA, including the direction of any deviation from the current ATC instruction or clearance'.

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.

The Board agreed that the instruction issued to the A321(A) crew by the INT to 'leave BIG heading 270' was explicit but, for whatever reason, the crew misunderstood the instruction and turned immediately onto the heading, which was a part cause of the Airprox. The NATS Advisor informed Members that, although the master RT recording clearly revealed that the A321(A) crew had read back 'heading 270', the desk-side replay was not at all clear, as highlighted by the Heathrow INT post incident; the issue of RT clarity desk-side is being investigated by NATS Engineering. The Board agreed that INT had not assimilated the incorrect read back and this was a second part cause. Members commented that if any received transmission is unclear at the time, the controller should always challenge the crew to repeat it.

Turning to risk, both INT and BIG controllers noticed A321(A)'s early turn and both issued timely and complementary avoiding action R turns to both flights ahead of STCA activating. Although both ac were apparently slow to turn - the ATC turns were given before TCAS RAs were received - the early intervention by ATC was in good time, with both crews following their complementary RAs and the ac turning out of confliction with no loss of separation. Members were disappointed that neither crew made an appropriate RT call advising that they were responding to TCAS RAs, only informing the respective controllers afterwards. Nevertheless, all of these factors when combined were enough to allow the Board to conclude that any risk of collision had been effectively removed.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The A321(A) crew misunderstood their instructions and the LTC Heathrow INT did not assimilate the incorrect read back.

Degree of Risk: C.