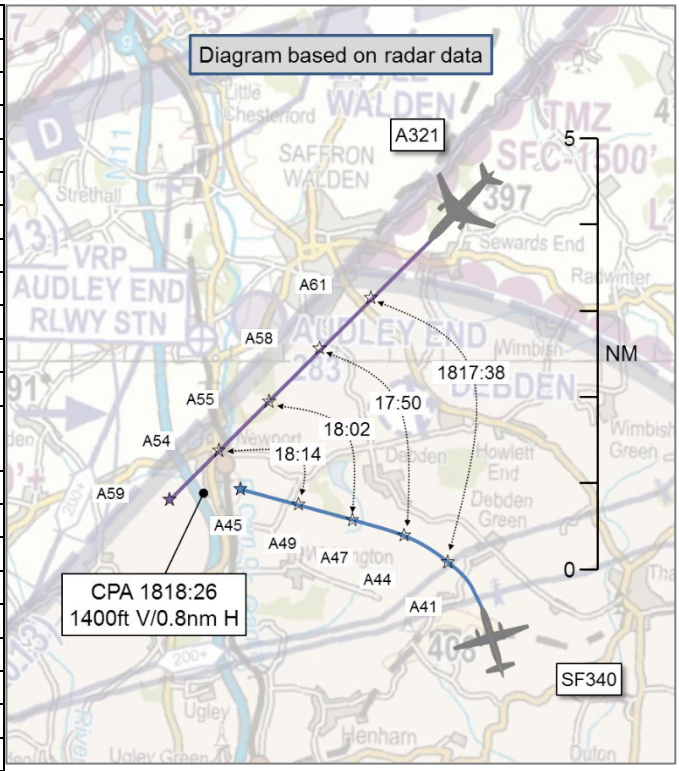
AIRPROX REPORT No 2019112

Date: 19 May 2019 Time: 1818Z Position: 5158N 00012E Location: 10nm E Barkway (BKY) VOR

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	S340	A321
Operator	CAT	CAT
Airspace	London TMA	London TMA
Class	A	A
Rules	IFR	IFR
Service	Radar Control	Radar Control
Provider	Stansted FIN DIR	Stansted FIN DIR
Altitude/FL	FL49	FL55
Transponder	A,C,S	A,C,S
Reported		
Colours	Company	White
Lighting	Strobes, landing, beacons, nav	Strobes, beacon, landing, nav
Conditions	VMC	IMC
Visibility	>10km	10km
Altitude/FL	4950ft	5400ft
Altimeter	QNH (1010hPa)	QNH
Heading	290°	210°
Speed	185kt	220kt
ACAS/TAS	TCAS II	TCAS II
Alert	RA	RA
Separation		
Reported	500ft V/1nm H	Not seen
Recorded	Min Lateral 1400ft V/0.8NM H Min Vertical 500ft V/1.1nm H	



THE SAAB 340 PILOT reports that he was on a UTAVA 1S SID and had intercepted the BKY 100° inbound radial. The Stansted Director issued a right turn to heading 290° and, just after this, a TCAS TA was generated showing traffic 1800ft above, approximately 2nm ahead. Soon after this the Director instructed 'avoiding action, descend to altitude 4000ft'. The autopilot was disengaged and a prompt descent initiated. At this point a TCAS 'descend, descend' RA was generated which was executed, followed by 'level off, level off'. They informed the Director of the RA. They then made visual contact with the other aircraft passing right-to-left in their 12 o'clock. The TCAS level-off had resulted in an altitude of 4500ft. Once clear of conflict they were given a frequency change and issued a further climb.

The pilot assessed the risk of collision as 'Medium'.

THE AIRBUS A321 PILOT reports that he was returning to Stansted on a training flight with 3 crew on the Flight Deck. Their Threat Error Management (TEM) brief included the fact that London TMA was very busy, therefore the sterile cockpit rule was adopted from FL200 and below. After handover to Essex radar, it became very apparent that the frequency was extremely busy. They were at 6000ft, 220kt on a southerly heading when they thought they were instructed by ATC to descend to 3000ft to be level 9nm before Barkway. The Pilot Monitoring read back the clearance. The Pilot Flying (PF) selected 3000ft on the FCU and began the descent. At approximately 1818hrs, descending through 5200ft, they received a TCAS TA. The PF responded in accordance with the drill. ATC then issued a 'return to 6000ft, don't understand why you descended'. The PF selected 6000ft and 'Open Climb' on the FCU. They were monitoring the conflicting traffic. They then received a TCAS RA at 5400ft instructing them to climb. The PF actioned the RA but forgot to call for "Flt Dirs off". The conflict was soon resolved, ATC were notified of the RA, and the aircraft returned to FL60. ATC frequency was saturated. ATC responded by telling us 'Not sure what happened there but we will pull the tapes'. They

noted that their callsign was being clipped and that there was at least another two aircraft with similar phonetic callsigns.

The pilot assessed the risk of collision as 'None'.

THE STANSTED FIN DIRECTOR CONTROLLER reports that he heard a garbled transmission and assumed that it was the outbound aircraft garbling with the inbound. He called the S340 pilot to check that it was him. Then, going back to check there was no other person taking a call, he saw the inbound A321 descending. He suspected the inbound A321 pilot had taken a call to 3000ft for someone else, but he could not be sure because it happened very quickly and before he could check properly. He gave an avoiding action descent and climb but TCAS took over.

Factual Background

The weather at Stansted was recorded as follows:

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METAR EGSS 191820Z AUTO 31001KT 9999 FEW033 15/11/Q1010=
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Analysis and Investigation

UKAB Secretariat

The S340 and A321 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard[1].

Occurrence Investigation

NATS Swanwick ATSI Report

The pilot of the A321, downwind for Stansted RW04 at 6000ft, responded to a descent instruction to altitude 3000ft intended for a B737 pilot. However, their garbled response was not challenged by the Stansted FIN controller. The subsequent descent of the A321 placed the aircraft into confliction with the departing S340 in the climb to 5000ft feet. Vertical resolution instructions were issued to both pilots prior to both aircraft receiving TCAS RAs.

Stansted FIN was being operated as an individual sector. The A321 was being positioned downwind for Stansted RW04 in the descent to 6000ft. The aircraft was established on the Stansted Intermediate (INT) Director frequency. The S340, was on an UTAVA1S departure from Stansted RW04, which has an uninterrupted climb to the final altitude of 5000ft. The aircraft was established on the Stansted Tower frequency. The pilot of the A321 reported on the FIN frequency at 1816:35 and was acknowledged by the controller.

At 1816:49, the FIN controller instructed the pilot of the B737 (the preceding aircraft to the A321, downwind for RW04) "*descend to altitude three thousand feet, level Brookmans Park DME nine*." See Figure 1 for the relative positions of the aircraft.

[1] SERA.3205 Proximity.

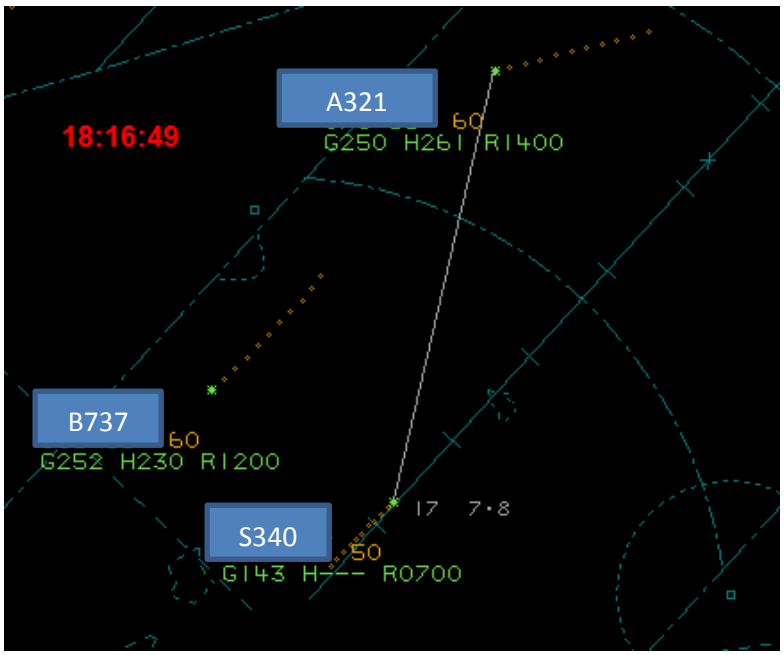

Figure 1.

In response there was a transmission with severe R/T garbling and, although listening repeatedly at various speeds on both the deskside recording (as heard by the controller) and the individual frequency, ATSI was only able to discern an element of the altitude restriction readback with a portion of the A321's callsign audible.

The FIN controller responded to the garbling with "[*S340 C/S] thanks just about copied you as well crossed with the other traffic squawk ident report passing altitude*." There was no response from the pilot of the S340 and the FIN controller repeated "*[S340 C/S] squawk ident report your passing altitude*." The pilot then replied "*eh passing three thousand five hundred feet on Utava one sierra*". Mode-S data displayed that both the A321 and the B737 promptly amended their selected levels (SFL) to 3000ft, indicating that both crews had replied to the earlier descent instruction.

At the time of the R/T garbling, the FIN DIR was coordinating with the INT DIR. He commented that this would have had a distracting effect and, with hindsight, he considered that he should have focused on the readback.

Low Level Short Term Conflict Alert (STCA) activated between the S340 and the A321 at 1817:42, see Figure 2.

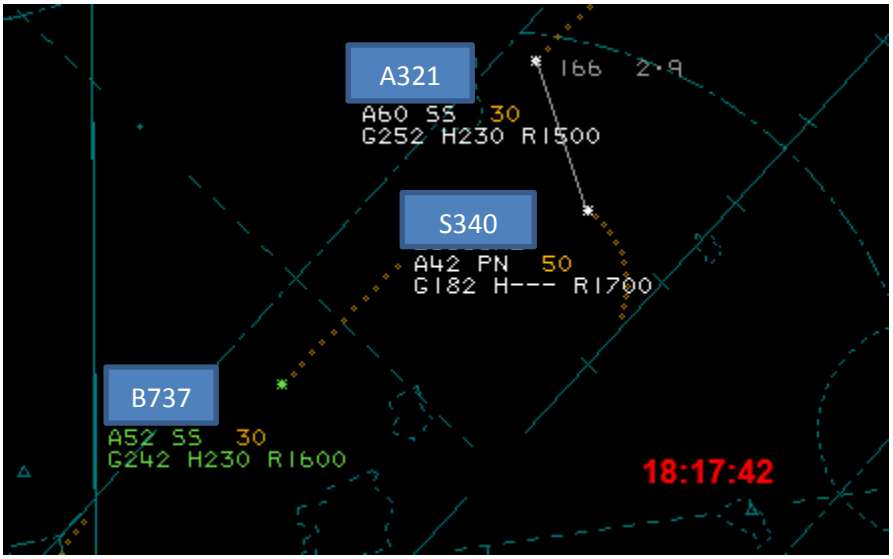

Figure 2.

Coincident with this, the FIN controller instructed the pilot of the S340 to fly heading 290°, to enable expeditious climb against the A321.

At 1817:53, the FIN controller instructed the pilot of the A321 to "*maintain six thousand feet please took the wrong call there back to six thousand feet now please*." The pilot responded "*heading back to six thousand feet*." The FIN controller then instructed the pilot of the S340, at 1818:01 "*stop descent now, stop descent now, avoiding action stop the descent and descend now altitude four thousand feet, descend now four thousand feet*." The pilot of the S340 replied "*TCAS RA*."

Separation was eroded at 1818:02, see Figure 3.

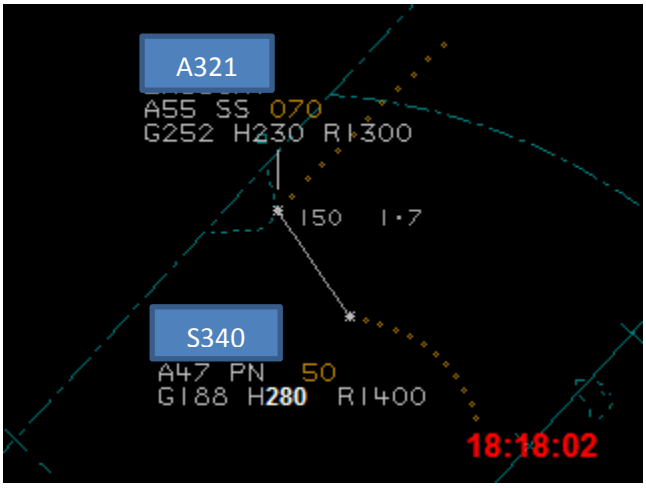

Figure 3.

High Level STCA activated at 1818:06, see Figure 4.

Figure 4.

Figure 5.

In response to the transmission from the pilot of the S340 reference a TCAS RA, the FIN controller replied "*Roger, that's all copied, and at moment traffic in twelve o'clock by a mile*." The pilot of the S340 further replied "*copied, yeah, we have him visual in descent*."

Minimum separation occurred at 1818:14 and was recorded on the LTCC Multi-Track Radar as 1.1nm and 500ft, see Figure 5. The next radar update at 1818:18 displayed that the A321 pilot had initiated a climb with an indicated altitude of 5500ft and the S340 pilot had initiated descent with an indicated altitude of 4700ft. The A321 pilot stated "TCAS RA" at 1818:21 and the FIN controller responded "*thank you, that is copied, maintain six thousand feet when you can, if you're clear of the RA.*" Vertical separation was restored between the aircraft at 1818:22.

ATSI requested analytics carry out a TCAS assessment of this event. Figure 6 shows the downlinked RA received by both aircraft as sourced directly from their Mode S Downlink. Due to the 4sec refresh rate, the timings of each downlinked RA may be up to 3secs late.

Date	Time	Callsign	Mode C	RA Type	Advisory Code
19/05/2019	1818:07	S340	50	Corrective	Descend
19/05/2019	1818:11	A321	55	Corrective	Climb
19/05/2019	1818:15	S340	48	Corrective	Descend
19/05/2019	1818:19	A321	58	Corrective	Limit Descent
19/05/2019	1818:19	S340	47	Corrective	Limit Climb

Figure 6.

Summary

An Airprox was reported when a S340 and an A321 flew into proximity near Barkway VOR at 1818hrs on Sunday 19th May 2019. Both pilots were operating under IFR, the S340 in VMC and the A321 in reported IMC. Both pilots were in receipt of a Radar Control Service from the Stansted FIN DIR.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots, the Stansted Final (FIN) Director (DIR), area radar and RTF recordings and reports from the appropriate ATC and operating authorities. Relevant contributory factors mentioned during the Board's discussions are highlighted within the text in bold, with the numbers referring to the Contributory Factors table displayed in Part C.

The Board first turned their attention to the actions of the FIN DIR. A Board member with experience of being an operational controller in the London TMA, confirmed that the positions of the Stansted Intermediate (INT) DIR and the Stansted FIN DIR were split and that the FIN DIR position was a busy sector that could not be split further; not only did it deal with Stansted inbounds but also with Stansted departures routeing via BKY. On this occasion, the A321 was being vectored to follow a B737 downwind for RW04, with the S340 departing Stansted on course to BKY. The inbound (descending) A321 and outbound (climbing) S340 were to be separated by their clearances to 6000ft and 5000ft respectively. In order to maintain separation from other sectors' traffic, it was necessary to instruct the B737 pilot to descend to 3000ft, to be level by Brookmans Park (BPK) DME 9. However, when this clearance was issued to the B737 pilot there was a garbled response, with two pilots crossing transmissions. The FIN DIR was expecting the departing S340 pilot to make contact on the frequency at any moment and assumed that the S340 pilot had attempted to establish communication at the same time as the B737 was acknowledging his descent clearance. Rather than make this assumption, the controller should have confirmed with the B737 pilot that he had received the descent clearance to 3000ft. What had actually happened was that the A321 crew and the B737 crew had simultaneously transmitted, with both crews thinking that they were cleared for descent. It was the responsibility of the controller to ensure that the correct pilot had read back the descent clearance (**CF1/CF3**) and, had he done so, this would have alerted the A321 crew that the clearance they believed had been addressed to them had indeed been for another pilot. The Board noted that it was reported that at the time of the R/T garbling the FIN DIR was verbally coordinating with the INT DIR for further climb for the S340, and members agreed that this may have distracted him from fully absorbing the pilots' transmissions at the time (**CF2**).

Civil Controller members noted that STCA had activated during the incident initially as a low-level warning of the A321 descending against the S340 climbing on conflicting tracks. They commented that this was not an unusual occurrence when two aircraft were approaching each other but still with separation being provided. The FIN DIR instructed the S340 pilot to turn left heading 290° to increase the horizontal distance between the two aircraft to allow for an expeditious S340 climb. At this point, the FIN DIR was not aware that the A321 pilot was continuing his descent, although the Selected Flight

Levels (SFL) of both the B737 and the A321 now showed 3000ft. The NATS advisor explained that it was not a requirement for controllers to monitor SFL although it was good practice to do so when possible; given the busy sector and the coordination with the INT DIR, he opined that the SFL changes could easily have been missed. However, shortly afterwards, and more or less coincident with the high-level STCA activating, the FIN DIR realised the situation and instructed the A321 pilot to return to 6000ft and the S340 pilot to descend to 4000ft. Both the S340 and A321 pilots also received TCAS RAs at that point (**CF7**).

Turning to the actions of the A321 crew, members noted that although they would have been expecting further descent shortly, the misheard ATC instruction to 'descend to 3000ft, to be level 9nm before BKY' was contrary to their previous clearance which referred the level-off to BPK. This should have indicated to the crew that the descent was issued sooner than would normally be expected. Some members were surprised that the descent instruction had therefore not been queried by at least one of the 3 crew in the cockpit, but a Civil Airline Pilot member commented that, given that this was a training flight, the other two crew members would not necessarily have been experienced, and all of them would have been concentrating on training issues at the time. Believing that the clearance was issued to their aircraft, the A321 pilot read back the clearance and commenced descent from his cleared level of 6000ft (**CF4/CF5**). Although the sector was busy, some members wondered whether the A321 crew should have been aware from their TCAS display that the S340 was proximate before they descended, but they acknowledged that operations in that airspace at that intensity could easily mean that the pilots might not assimilate such information, especially during a training flight. Finally, members wondered how the A321 crew could have confused the callsigns with the B737 ahead and noted that the A321 pilot had commented that there were other aircraft with similar callsigns on the frequency. However, although acknowledging that the frequency was busy, the Board were informed that the only similarity between the B737's callsign and their own was the last letter (**CF6**).

The Board debated the risk within this incident at some length. The required separation was either 1000ft vertically or 3nm horizontally, and it was apparent that separation in this incident had been well below that with only 500ft vertically and 1.1nm horizontally at one point (albeit shortly afterwards the required vertical separation had been regained because at 0.8nm the vertical separation was 1400ft and so, probably somewhere around 1nm separation, the required 1000ft had been achieved). Some members felt strongly that 2 aircraft coming within about 1nm of each other in controlled airspace without the required vertical separation represented a situation where safety had been much reduced below the norm (risk Category B). The civil controller members agreed that the situation had been closer than desirable, but they opined that, with 500ft separation and increasing, there had been no actual risk of collision. In their view, the safety barriers of TCAS, avoiding action, visual sighting by the S340 pilot and the controller's initial turn of the S340 onto heading 290° to increase horizontal separation meant there had not been a risk of a collision. A robust debate ensued about the actual risk of collision versus the level of safety reduction in an incident where the achieved horizontal separation in controlled airspace was a third of that required and vertical separation was half. In the end, the Chair called a vote in which the majority view was that although safety had been reduced, the risk of collision had been averted. Accordingly, although some members felt that this had very nearly been a Category B incident, the Board assessed the risk as Category C.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2019112-Barriers		
CF	**Factor**	**Description**	**Amplification**
	Ground Elements		
	• Regulations, Processes, Procedures and Compliance		
1	Human Factors	• ATM Regulatory Deviation	Regulations and/or procedures not complied with
	• Situational Awareness and Action		
2	Human Factors	• Distraction - Job Related	
3	Human Factors	• ATM Personnel Hear back	Incorrect readback not detected/corrected
	Flight Elements		
	• Tactical Planning and Execution		
4	Human Factors	• Action Performed Incorrectly	Incorrect or ineffective execution
5	Human Factors	• Flight Level/Altitude Deviation (Level Bust)	
	• Situational Awareness of the Conflicting Aircraft and Action		
6	Human Factors	• Flight Crew Callsign Confusion	
	• Electronic Warning System Operation and Compliance		
7	Contextual	• ACAS/TCAS RA	TCAS RA event

Degree of Risk: C

Safety Barrier Assessment[2]

In assessing the effectiveness of the safety barriers associated with this incident, the Board concluded that the key factors had been that:

Ground Elements:

Regulations, Processes, Procedures and Compliance were assessed as **partially effective** because the controller did not clarify that the correct pilot read back the descent instruction.

Situational Awareness of the Confliction and Action were assessed as **partially effective** because the controller was not aware initially that the A321 pilot had responded to the descent instruction issued to the B737 pilot. Consequently the avoiding action was delayed.

Flight Elements:

Tactical Planning and Execution was assessed as **ineffective** because the A321 pilot, due to R/T garbling and callsign confusion, descended in response to a descent instruction issued to another pilot. This resulted in a level bust.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **partially effective** because the A321 pilot was not aware of the traffic situation that was unfolding on his TCAS display when he commenced his descent.

[2] The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the UKAB Website.

See and Avoid was assessed as **not used** because although the S340 pilot saw the A321 as he manoeuvred under the TCAS RA, the TCAS manoeuvre was already ensuring separation and so he did not need to visually avoid the A321 at that point.