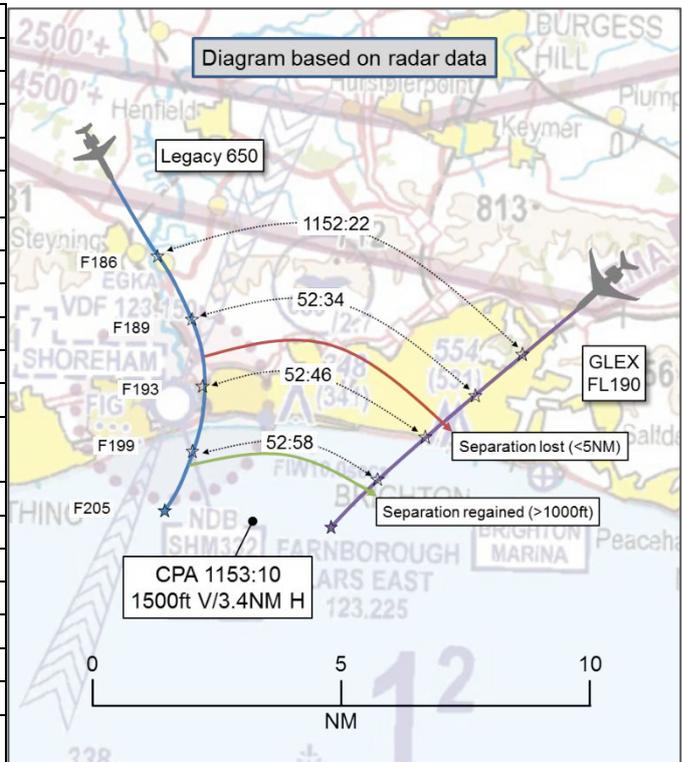


AIRPROX REPORT No 2019179

Date: 05 Jul 2019 Time: 1153Z Position: 5048N 00015W Location: W Seaford

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Legacy	Global Express
Operator	Civ Comm	Civ Comm
Airspace	London FIR	London FIR
Class	A	A
Rules	IFR	IFR
Service	Radar Control	Radar Control
Provider	Swanwick	Swanwick
Altitude/FL	FL197	FL190
Transponder	A,C,S	A,C,S
Reported		
Colours	Mainly white	White
Lighting	Strobe, red beacon, nav	Strobe, landing, nav
Conditions	VMC	IMC
Visibility	>10km	NK
Altitude/FL	FL190	FL140
Heading	NK	215°
Speed	300kt	250kt
ACAS/TAS	TCAS II	TCAS II
Alert	TA	TA
Separation		
Reported	500ft V/4-5nm H (on TCAS)	Not seen
Recorded	700ft V/4.2nm H 1500ft V/3.4nm H	



THE EMBRAER LEGACY 650 PILOT reports that he was maintaining his cleared level of FL190 on an ATC heading. On transfer to another frequency he was instructed to climb to FL290. This was shortly followed by an avoidance heading and to expedite climb through FL200. TCAS traffic was observed at the same level around 5nm in their 10 o'clock. A TCAS TA was received but no RA. A rate of climb of 3000fpm on ATC heading was achieved. Once clear of traffic a normal rate of climb was resumed.

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

THE BOMBARDIER BD700 GLOBAL EXPRESS PILOT reports that they departed from Biggin Hill RW03 on a SID LYD2, up to 2400ft. After departure, they were handed over to the next frequency. They were checking in at 2400ft on heading for the procedure. ATC cleared them initially to 3000ft and gave them a radar vector. Subsequently they were cleared to XAMAB. They recollected that they were climbing under radar vectors to FL140. During their climb they recognised on TCAS an indicated aircraft which was approximately 6nm away and 1000ft above them. They received a TA for a couple of seconds, just one callout 'traffic'. ATC gave them no information that they would get close to any aircraft during their climb.

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

THE SECTOR 18 TACTICAL/PLANNER CONTROLLER reports that two HASTY departures were presenting north of track, not on his frequency. He could see that the Legacy aircraft coming from TC Capital was stuck at FL180 (instead of climbing to FL210) due to a heavy stream of inbounds to them. Having checked the SFL of the Legacy and seen it remaining at FL180 (but expected at FL210) he decided to expedite climb a Bombardier CS100 through FL220 because it was already above the

Legacy. Otherwise there was a risk that TC Capital would climb the Legacy through the CS100's level. He anticipated the Global Express pilot would call him shortly after the CS100 pilot called. TC Capital then called him and asked if he wanted them to stop the Legacy at FL190 against the CS100. He told them the CS100 was not an issue because he had already resolved the conflict by climbing and expediting it. He should have said 'NO, stop it at FL180' but he thought that they had already started climbing the Legacy. He then called them back to ask them to stop it or keep it going because the Global Express was at FL190 and not on his frequency. TC Capital did not answer the telephone. He kept trying to call both the Legacy and the Global Express pilots. Neither were on his frequency and were closing at the same level. As soon as the Legacy pilot called he instructed him to climb to FL290, expediting, and he subsequently turned him, giving avoiding action (but not Traffic Information). The Global Express pilot called him only a few miles from the Legacy, well inside his airspace.

THE BIGGIN SECTOR CONTROLLER reports that he instructed the Global Express pilot to climb to FL190 and turned his attention to other traffic in the DET area. When he looked back, the Global Express was in level flight at FL190 with an unknown aircraft to him, the Legacy, in confliction. He issued avoiding action to the Global Express pilot and then Traffic Information; the crew reported that they had the traffic on TCAS but did not report an RA.

Analysis and Investigation

UKAB Secretariat

The Legacy and Global Express pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard¹. Notwithstanding, being under radar control, the controllers were required to ensure a separation of 5nm horizontal or 1000ft vertical between the 2 aircraft in these circumstances.

Occurrence Investigation

The Swanwick ATSI report

The Combined Sector 18 Tactical & Planner controller accepted the Legacy, under the control of TC Capital, into the sector at FL190 due the positioning of the CS100 into Sector 18 from TC BIGGIN. The Legacy had previously been held underneath TMA inbounds and would usually have entered the sector in the climb to FL210. This coordination of FL190 placed the Legacy into confliction with the Global Express, also maintaining FL190 under the control of TC BIGGIN (BIG) which was positioning into S18 on a south-westerly heading. The Legacy pilot was transferred to Sector 18 and both aircraft were issued avoiding action instructions by the respective controllers; however, this was insufficient to maintain separation. The Sector 18 controller submitted an Airprox report reference this event.

LAC Sector 18 (S18) was operating autonomously as a standalone sector, with the single controller operating as the Combined Tactical & Planner (S18 CT&P) due to predicted low traffic levels. The Legacy was established on the TC Capital (TC CAP) frequency in the climb to FL180 on a radar heading of 155°. This aircraft was subject to a Standing Agreement between TC CAP and S18, to be positioned in the climb to FL210 level by abeam Mayfield.

The Global Express enroute to Nice, was established on the TC BIGGIN (TC BIG) frequency in the climb to FL190 on radar heading of 235°. The Global Express was subject to a Standing Agreement between TC BIG and S18 to be level at FL190 by the S18 boundary. The Global Express was positioned to the south of the CS100 in the climb to FL190 which was also subject to the same Standing Agreement between TC BIG and S18.

¹ SERA.3205 Proximity.

The pilot of the CS100 reported on the S18 frequency at 1149:34 (all times UTC) and the S18 CT&P later instructed the pilot, at 1150:33 to climb to FL290 and to expedite the climb out of FL220. See Figure 1 for relative positions of the aircraft.



Figure 1.

At 1151:01, the S18 CT&P instructed the pilot of the CS100 to turn left onto 180°. The TC CAP controller telephoned S18 at 1151:06 (Figure 2), reference the Legacy stating “do you want him at nineteen (FL190), released for climb against that [CS100 C/S]” and the S18 CT&P responded “the [CS100 C/S] is going to miss him now, but nineteen is going to be better for me.” FL190 was coordinated for the Legacy.

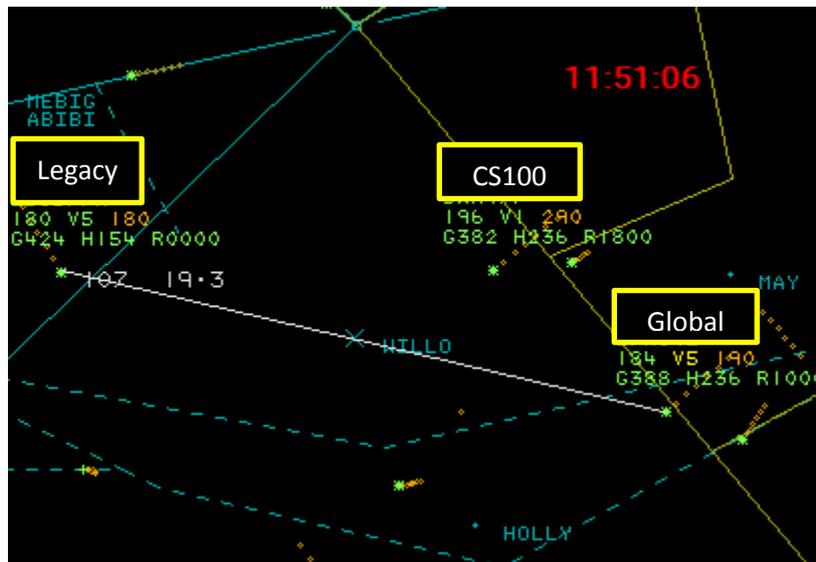


Figure 2.

Coincident with this telephone call, the Global Express entered S18 airspace at FL184 in the climb to FL190.

At 1151:23, the S18 CT&P attempted to raise the pilot of the Global Express on frequency; however, there was no response as the aircraft was still established on the TC BIG frequency. The pilot of the

Legacy was issued climb to FL190 by the TC CAP controller at 1151:25 and subsequently transferred to the S18 frequency.

At 1151:28, the S18 CT&P initiated a telephone call to TC CAP, then briefly TC South West and then TC CAP again, without answer. During these attempted calls the pilot of an unrelated aircraft (B737) reported onto the S18 frequency which the S18 CT&P initially acknowledged and subsequently ignored on the second pilot call. The S18 CT&P can be heard on the live phone line at 1151:39 stating “*come on, answer the phone...those two are going... (reference the impending conflict).*”

The S18 CT&P made another R/T call to the Global Express pilot at 1151:56 with no pilot response, following this with a call to the pilot of the Legacy. The Legacy pilot responded at 1152:00 with their flight details and the S18 CT&P instructed the pilot to “*climb Flight Level two-niner-zero, expedite out of Flight Level two hundred*”, which the pilot correctly readback.

During this R/T exchange low-level Short Term Conflict Alert (STCA) activated between the Global Express and the Legacy on the LAC radar display at 1152:10², prior to high-level STCA activating three seconds later. Immediately following the pilot readback, at 1152:16 (Figure 3) the S18 CT&P instructed the pilot of the Legacy “*Avoiding Action, turn right heading two-three-zero degrees*” which was correctly readback.

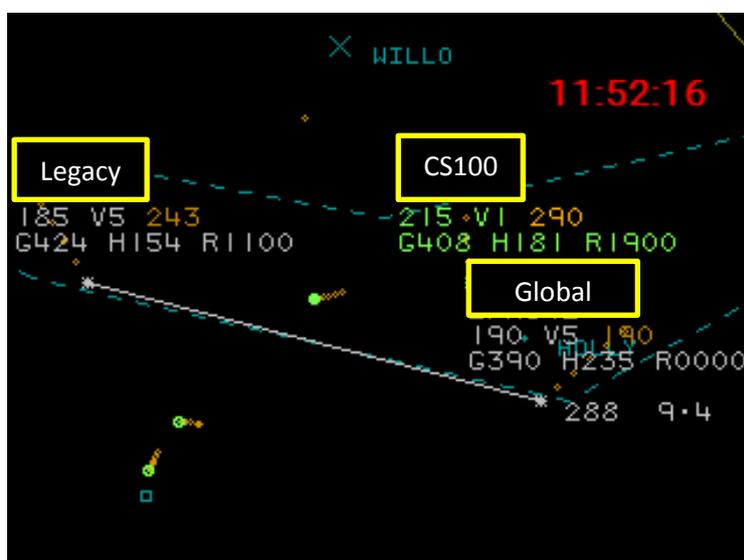


Figure 3.

The pilot of the CS100 was issued a left turn onto 155°. The pilot of the B737 reported onto the S18 frequency for a third time and was instructed to standby, with the S18 CT&P repeating the earlier climb clearance for the Legacy at 1152:41 to “*continue climb Flight level two-niner-zero, expedite the climb,*” which the pilot readback as “*expediting three thousand feet a minute, present time.*”

Separation was eroded at 1152:46 (Figure 4).

² ATSI Note: Low-level STCA activated between the two aircraft on the LTCC Multi-Track Radar at 1152:14.



Figure 4.

At 1152:46 (coincident with the loss of separation), the TC BIG controller instructed the pilot of the Global Express “avoiding action, turn left heading one-eight-zero degrees”, which was correctly readback. The TC BIG immediately followed this with Traffic Information with reference to the Legacy stating “traffic off your right hand side, range of three miles just climbing through you now.” The pilot responded that they had the traffic on TCAS. The Global Express pilot was transferred to the S18 frequency at 1152:58.

Minimum separation occurred at 1152:54 (Figure 5), and was recorded on the LTCC Multi-Track Radar as 4.2nm and 700 feet.



Figure 5.

Vertical separation was restored at 1153:02 as the Legacy passed FL200.

LAC Sector 18 (S18) was operating autonomously as a standalone sector with the single controller operating as the Combined Tactical & Planner (S18 CT&P) due to predicted low traffic levels. Traffic Load Prediction Device (TLPD) data detailed that for the time period 11:45-12:00 there was an expected sector occupancy of 10 aircraft, with 11 aircraft expected in the following fifteen minute time period.

The TC BIG sector was operating in a bandboxed configuration, combined with the TIMBA and GODLU sectors as TC South-East.

The CS100 and the Global Express were issued parallel headings of 235° by the TC BIG controller and positioned toward S18. These aircraft were subject to a Standing Agreement between the sectors.

The procedures in both LTC and LAC MATS Part 2 are complementary, with LTC MATS Part 2 STH 1.6.5 detailing that the aircraft are to be:

TIMBA	AC S18	FL190 lvl AC S18/S17 Boundary	EGLC/MC/KB/SS departures via LYD (Notes 1, 2, 3 & 4)
<p><i>Note 1: Traffic shall be positioned between MAY and the AMDUT - WAFFU track. Aircraft unable to achieve the SA level shall be co-ordinated with TC WILLO and AC S18. If north of MAY co-ordinate with AC S18 / TC VATON and if south of the AMDUT - WAFFU track co-ordinate with AC S18 and AC S17.</i></p>			

The CS100 was positioned 4.8nm north of MAY (Figure 6), with no coordination effected by the TC BIG controller with the S18 controller. This positioning was to ensure that the aircraft remained clear of Heathrow and Gatwick arrivals from the south. The Global Express was not level by the S17/S18 boundary, (see Figure 2), again with no coordination effected with the S18 controller.



Figure 6.

Upon receiving the CS100 on frequency, the S18 CT&P could not initially issue further climb due to conflicting inbound traffic within S17 a B737 in the descent to FL200 (see Figure 6) and could not issue a left turn as a result of the Global Express.

The CA4114 report from the S18 CT&P reported that ‘he could see that the Legacy coming from TC Capital was stuck at FL180 (instead of climbing to FL210) due to a heavy stream of inbounds to them. Having checked the SFL of the Legacy and seen it remaining at FL180 (but expected at FL210) he decided to climb the CS100 and expedite through FL220 because he was already above the Legacy. Otherwise there was a risk that TC Capital would climb the Legacy through the CS100. He anticipated the Global Express would call me shortly after the CS100.’

The Legacy was subject to a Standing agreement between TC CAP and S18 as detailed below:

From	Standing Agreement	Conditions
EGGW & WU	FL210 level abeam MAY	See Note 1 and TELTU Triangle Responsibilities (WOR 2.3.2.4.3)

The LAC Sector 17 Planner (S17 P) had highlighted the CS100 to the TC CAP controller in a telephone call at 1148:27 asking “*have South told you about that one*” and later in the discussion the TC CAP controller stated “*well I won't drop that inbound [B737 C/S]*” (shown in Figure 6). The TC BIG controller later notified the TC CAP controller of the CS100 by telephone.

The TC CAP controller reported that the Legacy had levelled off at FL180 due to a stream of inbound traffic at FL190. The CA4114 report from the TC CAP controller detailed ‘*Usually the Legacy would have been transferred by him to S18 climbing to FL210 as a standing agreement however, due to the late coordinated CS100 which was only passing FL194 he telephoned S18 to coordinate FL190 Released For Climb to which they replied "that's better for us anyway"*’

Following the telephone call between S18 and TC CAP at 1151:06, during which it was agreed that the Legacy would climb to FL190, the S18 CT&P first attempted to raise the Global Express pilot on frequency at 1151:23 and then telephoned TC CAP at 1151:28.

The CA4114 report from the S18 CT&P further detailed ‘*TC Capital then called him and asked if he wanted them to stop the Legacy at FL190 against the CS100. He told them the CS100 wasn't an issue as he'd already resolved the conflict by climbing and expediting it. He should have said NO - stop it at FL180 but he thought they'd already started climbing it. He called them back to ask them to stop it or keep it going as the Global Express was at FL190, not on his frequency. TC Capital didn't answer the phone. He kept trying to call both the Legacy and Global Express pilots. Neither were on his frequency and were closing at the same level.*’

Upon amending the coordination for the Legacy to FL190, the S18 CT&P did not amend this level within the iFACTS toolset. This resulted in the system not correctly predicting the interaction between the Legacy and the Global Express.

The S18 iFACTS toolset was predicting the conflict between the Global Express and the Legacy as initially a yellow interaction, then an orange interaction based on the Legacy continuing climb to FL210.

The pilot of the Legacy reported on the S18 frequency at 1152:00 and was issued climb to FL290 and this clearance was input into iFACTS. A red interaction was subsequently displayed at 1152:10 indicating that iFACTS predicted 5nm separation would be eroded, see Figure 7 for S18 CT&P Separation Monitor (SM).

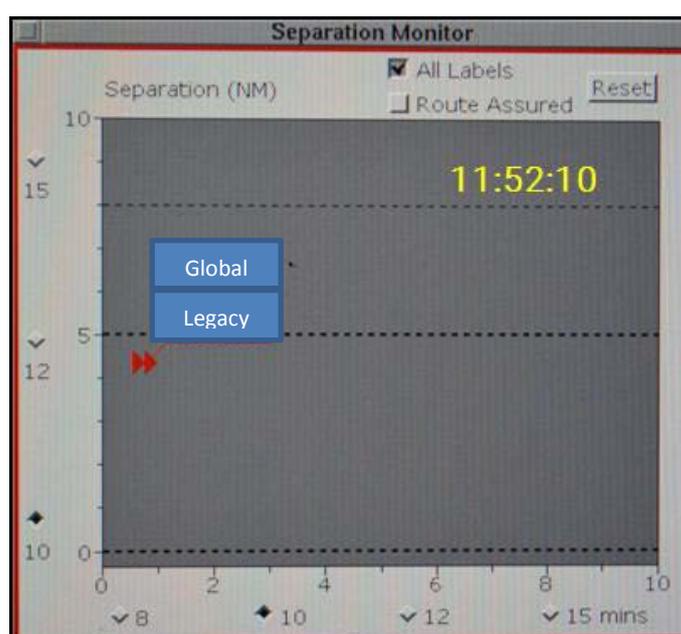


Figure 7.

ATSI Note: The S18 CT&P had already detected the confliction significantly prior to the iFACTS SM indications, as evidenced by the attempts to raise the Global Express pilot on the R/T and the telephone calls to the adjacent sectors.

The CA4114 report from the S18 CT&P further stated *'As soon as the Legacy pilot called he climbed him to FL290, expediting, and subsequently turned him giving avoiding action (but not Traffic Information). The Global Express pilot called him only a few miles from the the Legacy, well inside his airspace.'*

The NATS4118 report made reference that the S18 CT&P *'had assessed the Legacy and the CS100 as the primary issue and therefore climbed the CS100 to expedite clear of the conflict in case the Capital controller climbed to the Standing Agreed level of FL210. The TC SE controller had not promptly transferred the Global Express, rather unusually, and the Capital controller was struggling with available levels due to the Lorel demand.'*

When the RFC coordination for the Legacy was effected, the S18 controller believed by taking it at FL190 and given the relative distance between the Global Express and the Legacy, meant he would have plenty of time for them to check in and resolve the confliction. As it happened both aircraft were not transferred timely enough from both TC sectors for this erroneous plan to be executed.'

The TC BIG controller submitted a CA4114 report which stated *'he climbed the Global Express to FL190 and did some other things in the DET area. When he looked back, the Global Express was in level flight at FL190 with an unknown aircraft to him (the Legacy) in confliction. He issued avoiding action to the Global Express pilot and then Traffic Information, the crew reported that they had the traffic on TCAS but did not report an RA.'*

ATSI Note: Following the issuance of Avoiding Action to the Global Express, the TC BIG controller passed Traffic Information with reference to the Legacy. The pilot responded that they had the traffic on TCAS. A TCAS assessment was requested which stated that neither aircraft received a TCAS RA.

The TC BIG controller positioned the CS100 north of Mayfield and the Global Express did not achieve FL190 by the S17/S18 boundary, both outside the conditions of the Standing Agreement with S18, without appropriate coordination. These aircraft were positioned to the north of the sector to remain clear of a Heathrow and Gatwick arrival from the South.

The S18 CT&P issued an expedited climb and Avoiding Action turn to the pilot of the Legacy which effectively mitigated the confliction. The TC BIG controller upon becoming aware of the confliction issued appropriate avoiding action and Traffic Information to the pilot of the Global Express.

Summary

An Airprox was reported when a Legacy and a Global Express flew into proximity near Seaford at 1150hrs on Friday 5th July 2019. The Legacy pilot was operating under IFR in VMC, the Global Express pilot was operating under IFR in IMC. Both pilots were in receipt of a Radar Control Service from Swanwick; the Legacy from the Capital Sector and the Global Express from the Biggin Sector.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots, the Swanwick controllers, 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.

A Civil controller member with experience of Swanwick AC described to the Board the situation leading up to the Airprox. The Legacy and Global Express pilots were initially being provided with a Radar Control Service by Terminal Control, the Legacy by the Capital Sector and the Global Express by the Biggin Sector, before they were handed over to Swanwick Area Control Sector 18. At that time, both the S18 Planner and Tactical duties were being performed by one controller. This, the member considered, was acceptable because of the low level of forecast traffic.

The controller member went on to explain that the standing agreed level for the Legacy was FL210 to be level by abeam Mayfield. However, due to a stream of inbound traffic at FL190, the Legacy was kept down to FL180. The Capital controller telephoned the S18 controller to coordinate the Legacy and, because he had already climbed a CS100 in anticipation of a potential conflict, the S18 controller accepted the Legacy at FL190. However, he did not amend the Legacy's level within the iFACTS toolset (**CF2**) thereby resulting in the system not correctly predicting the interaction between the Legacy and the Global Express, both now at FL190. The S18 controller assumed that the Global Express pilot would shortly contact his frequency and, in view of the distance between the two aircraft, he would then be able to issue it with further climb to ensure separation from the Legacy. However, neither pilot contacted S18 until later than expected. The S18 controller, now realising that the subject aircraft were closing at the same level, attempted to contact the Global Express pilot, but without success (because it was still on the Biggin frequency). He also tried to contact the Capital Sector to agree a revised level for the Legacy, again without success. Noting that the S18 controller had effectively accepted the Legacy into his airspace whilst in conflict with the Global Express with which he had yet to establish contact, the Board considered that the coordination agreed by S18 was ineffective (**CF1/CF7**) because he was relying on being able to talk to one, or ideally both, pilots prior to them conflicting.

Meanwhile the Biggin Sector controller had not handed over the Global Express to S18 and the Board noted that the Standing Agreement for the transfer to S18 was to be level at FL190 by the S18 boundary. The radar recordings show that the aircraft was passing FL184 at the boundary but no coordination had been agreed for the aircraft not to have reached FL190 at the time. The Biggin controller reported that, after climbing the Global Express to FL190, he had turned his attention to other traffic in the Detling area (**CF6**). When he looked back the Global Express was in conflict with the Legacy, which was unknown traffic to him. He issued avoiding action to the Global Express pilot, followed by Traffic Information. The Board considered that the avoiding action was provided late (**CF3**) because of the Biggin controller turning his attention to other traffic and the Global Express pilot not being on the S18 frequency.

Shortly before this, the Legacy pilot had contacted S18 and had been cleared for an expeditious climb to FL290, although Traffic Information was not issued about the Global Express (**CF4**).

Despite the action by the two controllers, the required separation of 5nm horizontal or 1000ft vertical was not met, albeit the Board noted that the loss of separation had been minimal and had only lasted 16 secs (**CF5**). The Board noted that a closest vertical separation of 700ft was recorded at 4.2nm horizontal range, and that the minimum horizontal separation of 3.4nm occurred slightly later as the vertical separation increased to 1500ft (thereby satisfying the required vertical separation criteria).

The Board then turned to the risk of the Airprox. It was noted that both pilots had reported receiving only a TCAS TA (**CF8**) but no RA. Bearing in mind the minimum separations recorded, it was considered that, although safety had been degraded, there had not been a risk of a collision. Accordingly, the Board assessed the risk as Category C.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK:**Contributory Factors:**

2019179			
CF	Factor	Description	Amplification
Ground Elements			
• Regulations, Processes, Procedures and Compliance			
1	Human Factors	• ATM Regulatory Deviation	Regulations and/or procedures not complied with
• Manning and Equipment			
2		• Any other event	iFACTS not used effectively
• Situational Awareness and Action			
3	Human Factors	• Conflict Resolution - Provided Late	
4	Human Factors	• Traffic Management Information Provision	Not provided, inaccurate, inadequate, or late
5	Human Factors	• Separation Provision	Not Achieved
6	Human Factors	• Distraction - Job Related	
7	Human Factors	• ATM Coordination	Inadequate or ineffective
Flight Elements			
• Electronic Warning System Operation and Compliance			
8	Contextual	• ACAS/TCAS TA	TCAS TA / CWS indication

Degree of Risk: C

Safety Barrier Assessment³

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 coordination was not fully carried out when Standing Agreements were not met.

Manning and Equipment were assessed as **partially effective** because the S18 CT&P did not amend the coordinated level of the Legacy within the iFACTS toolset, resulting in the system not correctly predicting the interaction between the Legacy and the Global Express.

Situational Awareness of the Confliction and Action were assessed as **partially effective** because the situation was resolved late due to neither aircraft being on the S18 frequency in the period leading up to the Airprox.

³ The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the [UKAB Website](#).

Airprox Barrier Assessment: 2019179		Within Controlled Airspace						
Barrier	Provision	Application	Effectiveness Barrier Weighting					
			0%	5%	10%	15%	20%	
Ground Element	Regulations, Processes, Procedures and Compliance	✓	!	[Yellow bar from 0% to ~18%]				
	Manning & Equipment	✓	!	[Yellow bar from 0% to 15%]				
	Situational Awareness of the Confliction & Action	✓	!	[Yellow bar from 0% to 15%]				
	Electronic Warning System Operation and Compliance	✓	✓	[Green bar from 0% to 10%]				
Flight Element	Regulations, Processes, Procedures and Compliance	✓	✓	[Green bar from 0% to 5%]				
	Tactical Planning and Execution	✓	✓	[Green bar from 0% to 5%]				
	Situational Awareness of the Conflicting Aircraft & Action	✓	✓	[Green bar from 0% to 10%]				
	Electronic Warning System Operation and Compliance	✓	✓	[Green bar from 0% to 15%]				
	See & Avoid	✓	○	[Red box from 0% to 5%]				
Key:								
	Full	Partial	None	Not Present	Not Used			
Provision	✓	!	✗	●				
Application	✓	!	✗	●	○			
Effectiveness	■	■	■	■	□			