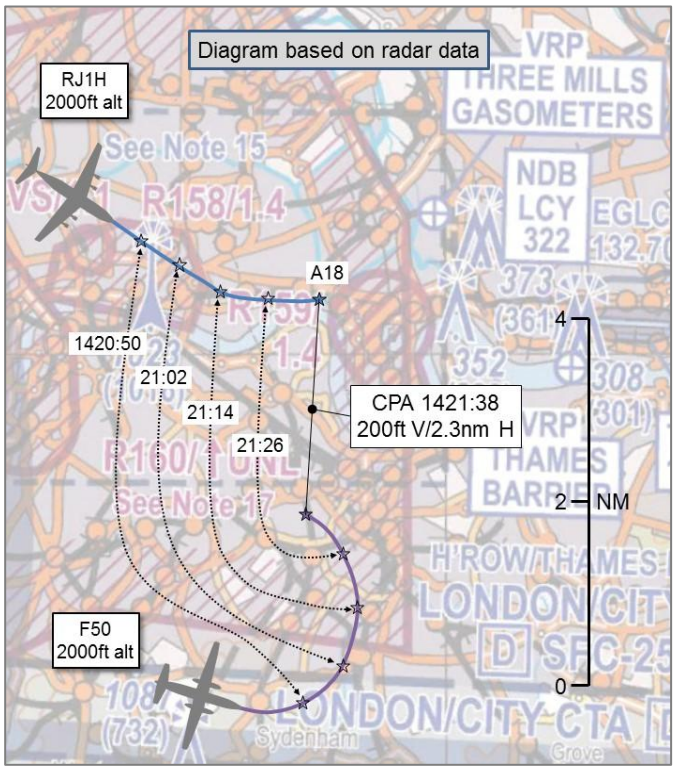
AIRPROX REPORT No 2013174

Date/Time: 8 Nov 2013 1421Z

Position: 5129N 00022W (4nm E London City Airport - elevation 19ft)

Airspace: London City CTR (*Class*: D)

	Aircraft 1	*Aircraft 2*
Type:	RJ1H	F50
Operator:	CAT	CAT
Alt/FL:	2000ft QNH	2000ft QNH
Conditions:	VMC CLBC	IMC
Visibility:	10km	NK
Reported Separation:	0ft V/2.5nm H	NK
Recorded Separation:	200ft V/2.3nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BAE RJ1H PILOT reports inbound to London City airport (LCY) on an IFR flight. Beacon and 'flood' lights were illuminated; SSR Modes C and S were selected; TCAS was fitted. It was an uneventful flight until he was issued with a delaying vector for the inbound turn due to 'radar echoes' between his position on left-hand downwind and the Final Approach Point (FAP) for ILS RW09. ATC advised him to reduce speed to 160kt, which he did after selecting flap F18. At the time, he was already at the final approach altitude of 2000ft QNH. Thereafter, a turn to an intercept heading (130°), together with the approach clearance, was received. Shortly afterwards he established on the Localiser RW09. Just after 5.5nm (DME ILS RW09), flap F24° was selected, with speed still around 160kt. Suddenly ATC ordered a quick descent to 1000ft as avoiding action and gave the other traffic a heading change. He observed traffic at 3 o'clock on his TCAS PPI's, at about the same altitude, in cyan, but never had visual contact (he had become VMC just a few seconds before, after passing an area with moderate showers of rain). He immediately selected Vertical Speed (V/S) 2000ft on the MCP [flight guidance panel] (initially for a short time 2500ft). On the way down to 1000ft he lowered the landing-gear. During the short descent the crew's main attention had been to remain clear of the Canary Wharf Towers, which he perceived was never a problem. After reaching about 1200ft above ground level (AGL), the speed was still too high to select flap F33°; flap F30° was selected and the Glide Slope was armed. Shortly afterwards, on the glide-path at about 1050ft, flap F33° was selected. With a V_{app} [approach speed] of 124kt, and his actual speed around 140kt between 900ft and 600ft, he decided to continue the approach, even though not exactly established according to the OM A (Operations Manual-Part A-company specific). He considered that the risk of a go-around with a possible Airprox with the other traffic seemed higher than to continue the approach. V_{app} was reached at around 400ft AGL and the landing was uneventful. The runway was in sight during the whole approach. The traffic on TCAS remained always cyan[1] and, consequently, no voice signal was received.

He assessed the risk of collision as 'Low'.

[1] Cyan is used to depict 'Proximate Traffic' i.e. non-threat traffic that is within 6nm horizontally and 1200ft vertically of the aircraft.

THE FOKKER F50 PILOT (F50) reports that he was inbound to LCY, IFR. As far as he could recall, wing strobe lights were illuminated. He had been vectored by Thames Radar from the Detling VOR to a downwind right-hand position, south of the runway, for a landing on RW09 at LCY. The weather conditions at the time were very showery and turbulent, with a strong southerly wind. The RJ1H pilot ahead of him had asked for weather avoidance headings which had resulted in the RJ1H being north of the airport and being vectored for a left-hand circuit onto RW09. As the F50 pilot's aircraft approached the 'Alexandra Palace' TV mast at 2000ft he was fully visual with the ground. The controller instructed him to make a left-hand orbit in his present position (south of the airport) because the pattern was too tight with the RJ1H, which was on a left-hand base-leg position. A left-hand orbit was commenced and, as he rolled out back onto the downwind heading, the controller instructed him to make a further left turn away from the airport. He suspected that the strong southerly wind had blown him closer to the RJ1H on final approach than expected. He did not receive a TCAS RA alert or sight the RJ1H. He was then vectored for an uneventful landing on RW09.

THE LCY RADAR DIRECTOR (DIR) reports that the RJ1H pilot was positioned downwind left-hand for RW09 at LCY and was handed over to him by Thames Radar. The F50 pilot was positioned downwind right-hand for RW09 at LCY, also handed over to him by Thames Radar. The RJ1H pilot was at 2000ft, 160kt and about 5nm NW of LCY when he advised LCY DIR that he would need to carry on downwind for another 4nm to avoid build-ups. LCY DIR co-ordinated this with Special/VFR, Northolt and Heathrow. At about 10nm NW of LCY the pilot was able to make a left turn which he issued. In the mean time he had instructed the F50 pilot to descend to 2000ft and to reduce his speed to 160kt. Because of the extended downwind of the RJ1H, he had run out of room for the F50: he could not go beyond Vauxhall Bridge because of Heathrow traffic on westerly arrivals descending out of 3000ft; a right turn would take it into confliction with the RJ1H; and a climb or descent was not an option due to Heathrow inbounds at 3000ft and terrain clearance. A left turn would take the F50 towards the Crystal Palace masts and outside controlled airspace, which he did not want to do because of all the warnings that had been received about excursions of IFR Airways traffic outside Controlled Airspace (CAS), especially on the Thames sector. He felt that the only option was to give the F50 pilot an orbit downwind, once he was sufficiently ahead of the Biggin Hill inbound aircraft that was following about 5nm behind at 1800ft. The RJ1H pilot was given a heading to establish on the ILS and the F50 pilot was given an orbit clear of the Biggin Hill inbound. Until now he had thought that the wind was insignificant as the downwind heading on previous traffic did not seem to have any drift but, as the F50 pilot turned through east, he realised that he was drifting north. He immediately passed avoiding action to the pilot of the RJ1H by instructing him to descend to 1000ft and issued Traffic Information. He then gave the F50 pilot avoiding action with an increased left turn and also passed him Traffic Information. He recalled that the pilot advised that he had the traffic in sight. He informed each pilot when they were clear of confliction and were able to continue their approaches.

Factual Background

The LCY weather was:

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METAR EGLC 081350Z 18005KT 140V210 9999 FEW028 13/07 Q1002=
METAR EGLC 081420Z 17010KT 140V210 9999 -SHRA SCT030 BKN150 11/07 Q1002 RERA=
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Analysis and Investigation

CAA ATSI

ATSI had access to area radar recordings, written reports from the pilot of the RJ1H and the LCY DIR, together with RTF recordings and a transcript of the LCY Radar frequency. The ATSU provided a copy of the unit investigation report.

At 1416:40 the RJ1H pilot, who was established on a heading of 280° at 2000ft, downwind left-hand for RW09, informed the LCY DIR that he needed to delay the turn onto base-leg for 4nm, to avoid weather. This was acknowledged.

The F50 pilot, who was downwind right-hand and number two to the RJ1H, was instructed to reduce speed to 160kt to 5nm.

The RJ1H pilot subsequently reported able to turn in. He was given a base-leg turn of 170° and then a closing heading for the localiser of 130°.

At 1419:25, the RJ1H was on a closing heading and the F50 was 3.2nm south of the final approach track for LCY (Figure 1).

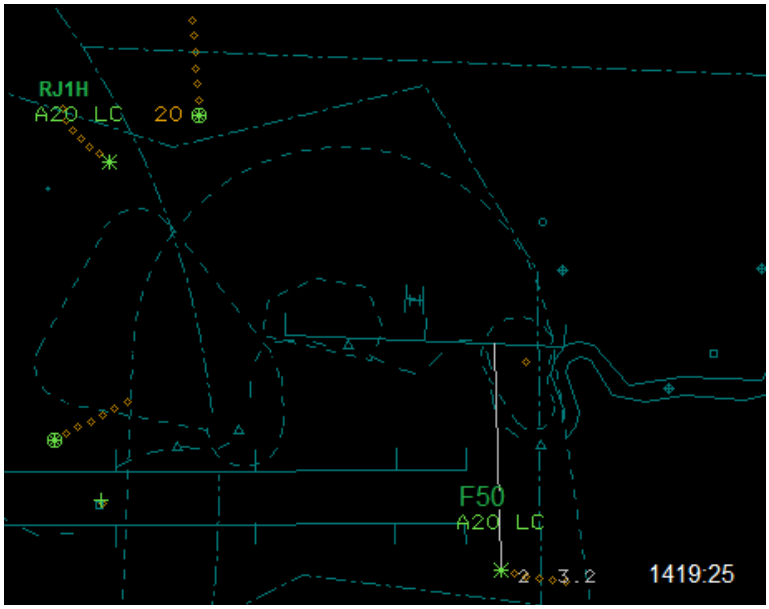

Figure 1.

The F50 pilot was informed by the LCY DIR that, due to the traffic ahead (the RJ1H), it would be necessary to issue him an orbit. The F50 pilot was instructed to "*do a lefthand three sixty please lefthand three sixty to roll out again on heading two seven zero degrees*". The pilot read-back "*lefthand three sixty to roll out at two seven zero no problem [F50 C/S]*". As the F50 pilot conducted the orbit, the southerly wind caused the F50 to drift to the north, and closer than anticipated to the extended centreline for LCY.

At 1421:10, as the F50 pilot was completing his orbit, the RJ1H pilot was about to establish on the localiser, 4.1nm to the north-northwest of the F50 (Figure 2).

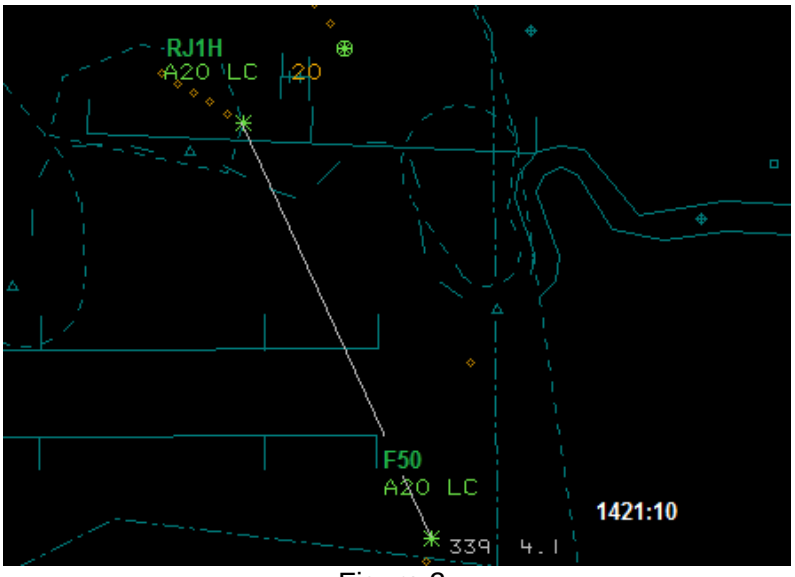

Figure 2.

The RJ1H pilot was instructed to *"[RJ1H C/S] descend altitude one thousand feet expedite avoiding action traffic right two o'clock three miles it's at two thousand feet"*. High level Short term Conflict Alert (STCA) activated as the RJ1H pilot read-back "*okay descending quickly to one thousand feet [RJ1H C/S]*". The F50's pilot was instructed *"[F50 C/S] avoiding action left turn two four zero degrees traffic in your right er one o'clock position two and a half miles descending to a thousand".*

As the F50 pilot turned left, the aircraft converged: at 1421:34, CPA, the two aircraft were 2.4nm horizontally and 100ft vertically apart and High-level STCA had reduced to Low-level (Figure 3).

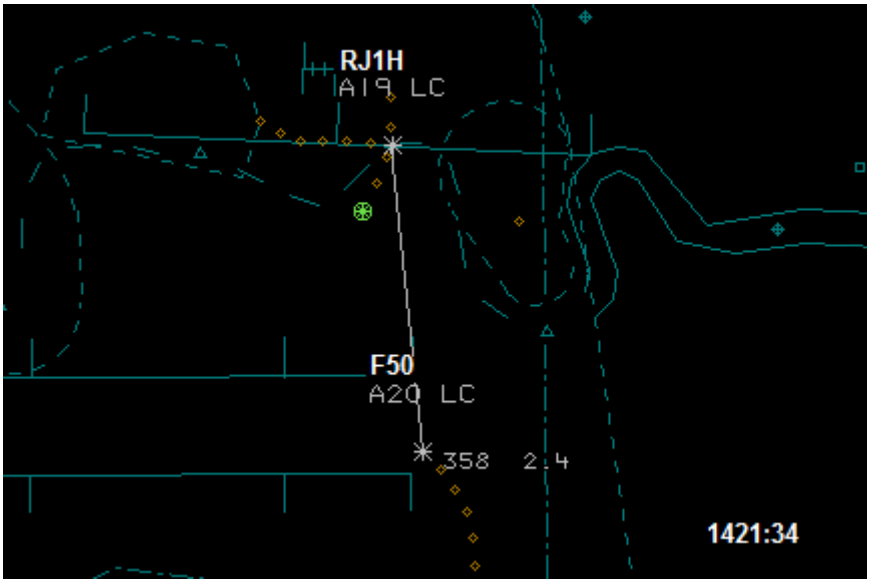

Figure 3.

At 1421:46, as the RJ1H pilot was approaching 3nm from touchdown, descending through 1500ft, the LCY DIR advised the RJ1H pilot that he was clear of the traffic and to continue with the ILS.

An extract from the Surveillance Minimum Altitude Chart (SMAC) for LCY (Figure 4) shows that the minimum altitude to be allocated to the RJ1H pilot, within the final approach vectoring area, was 1600ft. Canary Wharf Tower is shown at 806ft amsl on the chart.

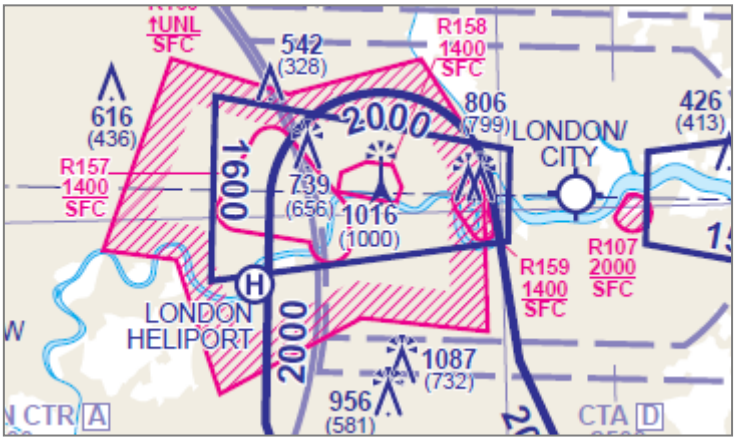

Figure 4.

There is also a restriction on the ILS chart for RW09 (Figure 5); the RJ1H descended through 1500ft as it passed 3 DME and 1200ft at 2.5 DME.

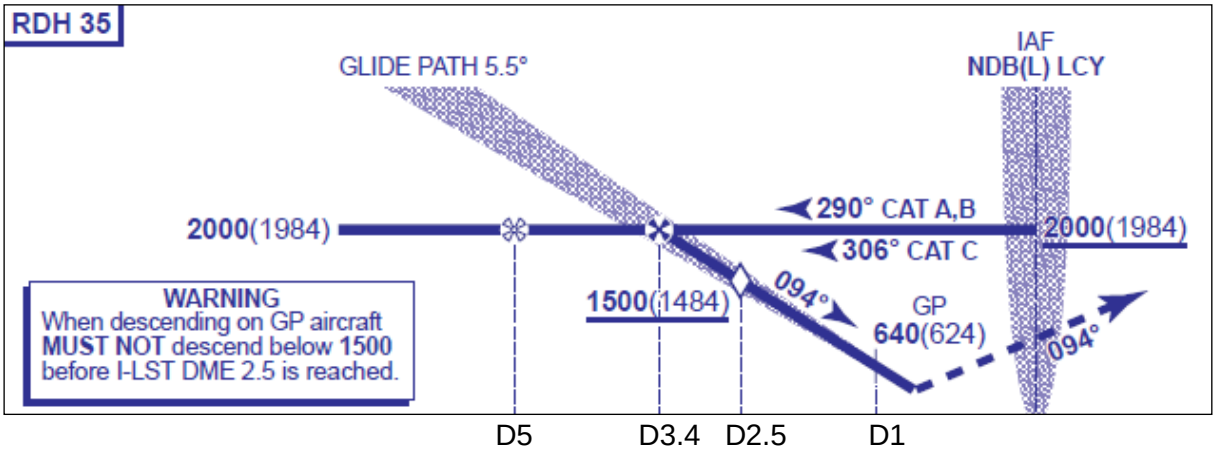

Figure 5.

The unit report indicated that the LCY DIR co-ordinated with both Heathrow and Northolt when the RJ1H pilot informed him that he needed to delay the base-leg turn. When the RJ1H pilot could accept a base-leg turn it was not operationally possible for the F50 pilot to continue downwind. The separation required behind the RJ1H was 6nm. In order to achieve this the LCY DIR had considered various options, including changing the order, giving the F50 pilot a climb or descent, or allowing the F50 pilot to continue downwind, all of which would have had other implications. Vectoring the F50 pilot outside controlled airspace was considered and rejected, and the LCY DIR decided that an orbit was the best course of action to delay the F50. When the confliction between the RJ1H and the F50 became apparent during the F50 pilot's orbit, the LCY DIR considered that 'avoiding action' was necessary and instructed the RJ1H pilot to descend to 1000ft. The LCY DIR was focussed on establishing 1000ft separation from the F50 and did not fully consider the implications of instructing the aircraft to descend to this altitude. The LCY DIR stated that, as the RJ1H was on the localiser, he "*knew it would miss Canary Wharf*".

Summary

The Airprox occurred within the LCY CTR when the LCY DIR instructed the F50 pilot to conduct an orbit in order to achieve the required separation on final approach behind the RJ1H. The southerly wind caused a degree of northerly drift as the F50 pilot completed his orbit, bringing the F50 and the RJ1H into conflict. In attempting to resolve the situation, the LCY DIR instructed the RJ1H pilot to descend to 1000ft[2]. The minimum separation recorded was 200ft vertically and 2.3nm horizontally (standard separation minima being 1000ft and/or 3nm).

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

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

The Board first discussed the constraints within which the LCY DIR was operating and how they affected the sequencing of the aircraft. Civil ATC members commented that, to start with, it was unusual for the RJ1H to be positioned left-hand downwind to LCY's RW09; in contrast, the F50 had been vectored right-hand downwind at 2000ft despite the weather. Both aircraft had been handed over to the LCY DIR by Thames Radar and some members wondered whether the Thames controller could have positioned the F50 further behind the RJ1H. It was pointed out that aircraft are normally spaced about 10nm apart to achieve 6nm spacing on final approach and, although the spacing was considered 'tight', there was nothing to suggest that the spacing at handover was inappropriate. A Civil ATC member further explained that, when the RJ1H pilot had requested to extend his downwind leg, the LCY DIR would have had to immediately coordinate this extra routeing with Northolt and

[2] This was below the minimum altitude to be allocated in accordance with the SMAC, and in contradiction with the warning published on the ILS(5.5°GP)/DME/NDB(L) RWY09 chart for LCY.

Heathrow ATC; he opined that the time taken to effect this unexpected coordination would have added to the controller's workload. Finally. it was noted that the LCY DIR had instructed the pilot of the F50 to reduce speed to 160kt, presumably to increase spacing between the two aircraft (aircraft passing north of the airport downwind would be operating at a standard speed of 180kt).

The Board noted that, after having vectored the RJ1H pilot onto a closing heading for the ILS at 2000ft, the LCY DIR subsequently realised that because of the restricted airspace available to him, it would not be possible to allow the F50 to continue downwind. A Civil ATC member explained that the LCY DIR's options were then very limited: he could not climb the F50 above 2000ft (because this would conflict with Heathrow inbound traffic descending to 3000ft) and he could not continue the downwind leg beyond Vauxhall Bridge (also because of conflictions with Heathrow traffic). Some Members wondered why the LCY DIR did not vector the F50 pilot outside CAS, not an ideal solution but it would have resolved the confliction. An ATC member explained that after other incidents occurring in the LCY area, LCY DIRs had been strongly encouraged not to vector aircraft outside CAS; consequently, the LCY DIR would have felt pressure not to take this action. The Board felt that all these actual and perceived airspace constraints were a contributory factor to the Airprox.

Although the ATC member explained that, from his experience, it was an unusual action, he considered that other than breaking off the RJ1H's approach (which most controllers would be very reluctant to do), probably the only remaining option available was to do as the LCY DIR had done and instruct the F50 pilot to make an orbit to the left. Unfortunately unknown to him, the southerly wind was greater than the LCY DIR believed, and this led to the loss of separation with the F50; if the wind speed had been lower, separation would probably have been achieved. The Board opined, therefore, that the southerly wind, together with the general weather conditions on the day (which led to the RJ1H pilot requesting extended routeing in the first place), were contributory factors to the Airprox.

The Board noted that the LCY DIR had issued an instruction to the RJ1H pilot to descend to an altitude of 1000ft (below the safety altitude for that area) when he realised that standard separation was not ensured. In the event, even with this instruction to descend, 1000ft vertical separation was still not achieved and horizontal separation was only 2.3nm at CPA (i.e. less than the 3nm or 1000ft required for standard radar separation). Although realising the difficult position of the LCY DIR, who was operating in 'tight' airspace and in unfavourable weather conditions, the Board considered that the cause of the Airprox was simply that the LCY DIR had not achieved standard separation. It was quickly decided that although standard separation had not been achieved, the collision risk should be categorised as C because the controller's actions had still been timely and effective in ensuring that there was no risk of actual collision.

Members also discussed the action of the RJ1H pilot after receiving the instruction to descend to 1000ft. In light of the combination of a subsequent unstable approach and a descent clearance below safety altitude, Civil Pilot members commented that, in his position, they would have carried out a missed approach.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The LCY DIR did not achieve standard separation.

Degree of Risk: C

Contributory Factors: 1. Wind and weather conditions on the day.

2. Perceived horizontal and vertical airspace constraints.

ERC Score[3]: 50.

[3] Although the Event Risk Classification (ERC) trial had been formally terminated for future development at the time of the Board, for data continuity and consistency purposes, Director UKAB and the UKAB Secretariat provided a shadow assessment of ERC.