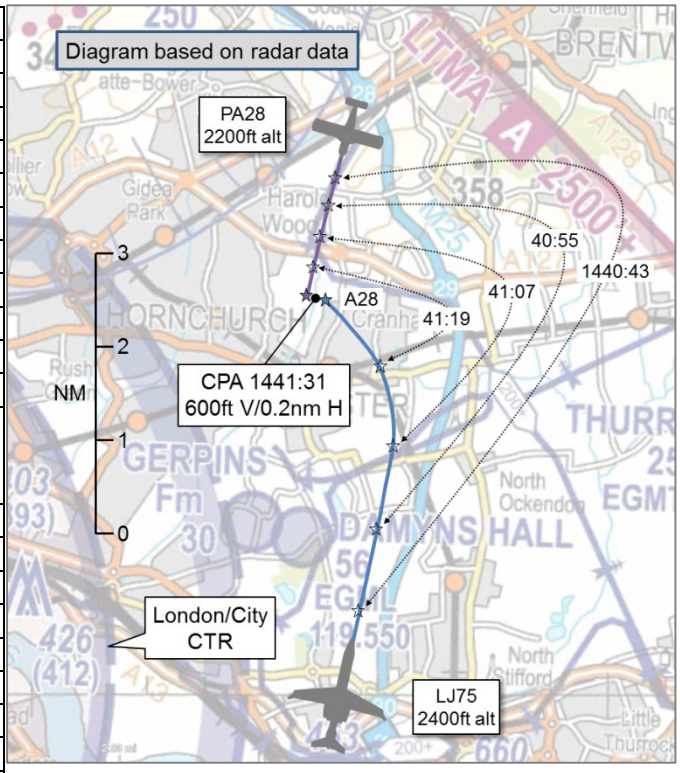
AIRPROX REPORT No 2016002

Date: 8 Jan 2016 Time: 1441Z Position: 5134N 00015E Location: 6nm E London City

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	LJ75	PA28
Operator	Civ Exec	Civ Trg
Airspace	London TMA	London FIR
Class	A	G
Rules	IFR	VFR
Service	Traffic[1]	None
Provider	Thames	N/A
Altitude/FL	2800ft	2200ft
Transponder	A/C/S	A/C/S
Reported		
Colours	Mainly white	Mainly white
Lighting	Recognition, anti-collision, nav, strobes	Nav, fin beacon, strobes
Conditions	VMC	VMC
Visibility	10km	15km
Altitude/FL	2400ft	2300ft
Altimeter	QNH (997hPa)	QNH (998hPa)
Heading	360°	194°
Speed	240kt	115kt
ACAS/TAS	TCAS II	Not fitted
Alert	RA	N/A
Separation		
Reported	300ft V/1200m H	500-1000ft V/1nm H
Recorded	600ft V/0.2nm H	



THE LEARJET 75 (LJ75) PILOT reports that they departed Biggin Hill on a ferry flight to Luton. Because a SID takes them far away from London and then back to the city, they requested a 'radar-to-radar' service which was coordinated on the ground before departure. They were cleared to climb to 2400ft, switched to radar, and were informed that they were receiving a Traffic Service. They received several heading instructions and Traffic Information. At one point they were given a left turn and were issued with Traffic Information. However, they received a TCAS RA, which they followed immediately. They did not see the other aircraft. On the same day, a nominated person for the company's Flight Operations and the company's Safety Manager had a safety assessment meeting and concluded that a briefing[2] should be prepared for pilots carrying out ferry flights in the London area (because they can expect these flights to happen occasionally and to emphasize that they are flights in uncontrolled airspace) and to emphasize to the pilots, as a safety precaution, only to request a 'radar-to-radar' service in VMC because of the various types of airspace/ATC services that could be encountered (the event was in VMC). He added that these flights can be high workload because the crew has to listen to ATIS (which he said was not easy to understand while at this altitude), prepare for approach, do the briefing and all other procedures, all whilst flying in a congested area with a limited flight time (for them it was 18 minutes from take-off to landing).

He assessed the risk of collision as 'None'.

[1] The LJ75 pilot was technically under a Radar Control Service as soon as he climbed into Class A airspace in response to the TCAS RA.
[2] See Appendix A.

THE PIPER PA28 PILOT reports that they were conducting a CPL Navigation exercise from J28 on the M25 direct to Deanland, 40nm to the south, as a training session. The student had set course from the regular starting point and was just changing frequency to Farnborough East to request a Basic Service. While the flying pilot had his head in the cockpit to operate the radio, the instructor questioned whether he was 'visual with the traffic'. He then pointed out the closing traffic, which was confirmed by all the occupants who each saw the aircraft. He saw the aircraft at 5nm in his 10-11 o'clock position. The instructor commented that he expected that it was in Controlled Airspace (CAS) at about 2600-2800ft. The point was made about maintaining a look-out as a high priority when carrying out tasks.

He assessed the risk of collision as 'Low'.

THE THAMES/CITY CONTROLLER reports that a Biggin Hill departure, the LJ75, was released by the previous controller climbing to 2400ft; he was told the LJ75 pilot was requesting to route low-level outside CAS to Luton. The LJ75 departed, was identified and put on a Traffic Service. He asked the pilot to confirm that he was happy to route low-level outside CAS, which he confirmed. He vectored the LJ75 pilot on a northerly track to the east of the London City CTR with the intention of positioning him north of the London City Control Area (CTA) and route him towards Brookmans Park (BPK) as had been coordinated with the Luton controller. When east-abeam London City, he saw traffic outside CAS south of Stapleford in the climb. He called London City Tower to see if they would accept the LJ75 transiting the corner of their CTA on a north-westerly track in order to deconflict against traffic outside CAS. The Aerodrome controller approved this and, at the time, he gave the LJ75 pilot Traffic Information on the unknown contact that was at 2200ft and instructed him to turn left heading 300°. The strong southerly wind resulted in a very wide radius of turn bringing the LJ75 in close proximity to the unknown contact. He called the traffic again in his 12 o'clock, 1nm and asked him if he was visual. He reported that he had the traffic on TCAS, and shortly after reported a TCAS RA. He acknowledged the call and monitored the LJ75's Mode C. The LJ75 pilot started climbing from 2400ft which brought him inside CAS south of Lambourne (LAM). At the time there was London City inbound traffic approaching LAM from the north-west at 4000ft. He turned the London City traffic left heading 105° to position it away from the LJ75's track in case the TCAS RA resulted in a climb above 3000ft. The LJ75 pilot levelled at 3000ft, reported clear of conflict and resuming his clearance of 2400ft. He subsequently instructed him to resume his own navigation to BPK and transferred him to Luton.

Factual Background

The weather at London City was recorded as follows:

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METAR EGLC 081420Z 21009KT 9999 FEW030 BKN045 10/04 Q0998
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The UK AIP[3] states the Flight Procedures for Biggin Hill IFR departures:

> 'IFR traffic departing from Biggin Hill routeing outside Controlled Airspace will be co-ordinated with 'Thames Radar'.
>
> Standard Departure Routes for Airways departing to the north include Brookmans Park 2 (BPK 2) N57/L10 DET - BPK.
>
> For positioning flights to London Luton/London Stansted, follow BPK 2 SDR to BPK then join LOREL 2Q sic (4Q) STAR, at altitude as directed by ATC, in its appropriate place under the table.'

Figure 1 shows the appropriate part of the Luton STAR from BPK, which is applicable to inbounds from Biggin Hill.

[3] Page AD 2.EGKB-10

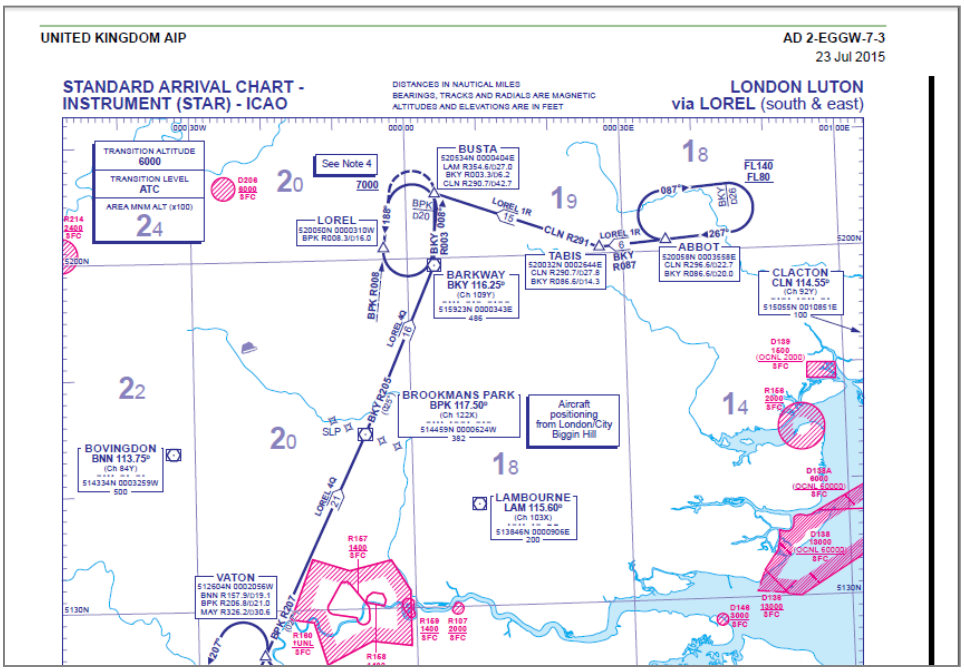


Figure 1 Luton LOREL STAR.

Analysis and Investigation

CAA ATSI

ATSI had access to reports from the controller and both pilots, together with area radar and RTF recordings of the unit position frequency and telephones. An interview was also conducted with the Thames controller. Screenshots produced in the report are provided using the area radar recordings. Levels indicated are altitudes. All times UTC.

At 1436:40 the LJ75 pilot, having departed Biggin Hill, contacted Thames Radar in the climb to 2400ft in a right turn on track to the Detling (DET) VOR. The pilot confirmed his earlier request to route outside CAS, low-level to Luton. The pilot reported being IMC and the controller confirmed that he was providing a Traffic Service.

At 1437:40 the LJ75 pilot was turned left on to a heading of 025° and he was advised by the controller that due to London City traffic he would provide vectors to take the aircraft outside the London City Control Zone (CTR) and around to the north (Figure 2).

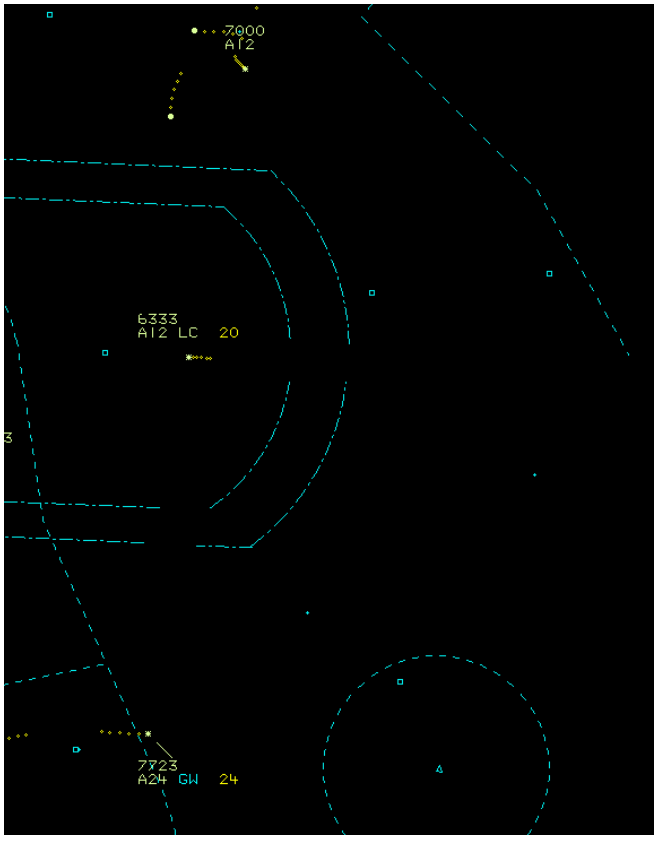


Figure 2 - 1437:40 (LJ75 code 7723).

At 1439:26 the LJ75 pilot was turned left on to a heading of 010° (Figure 3).

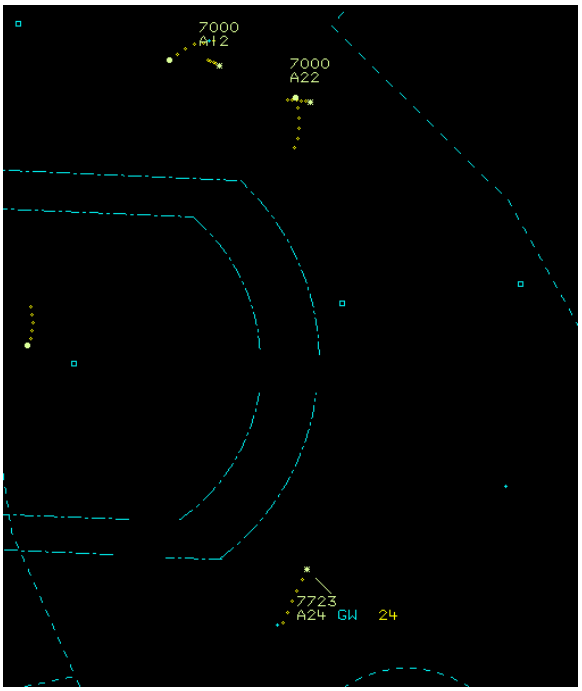


Figure 3 – 1439:26.

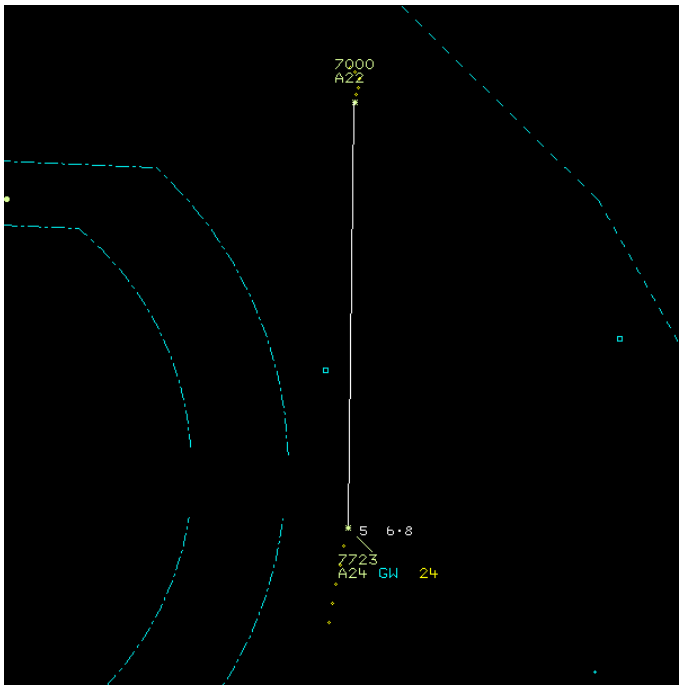


Figure 4 – 1440:25.

At 1440:25 the Thames controller contacted London City Tower to coordinate a transit of the north-eastern corner of their CTR with the LJ75, which was agreed. The LJ75 was passing underneath the London City final approach and the PA28 was 6.8nm north of the LJ75 tracking south (Figure 4).

At 1440:44 an Amber STCA was initiated and at 1440:45 the controller instructed the LJ75 pilot to turn left on to a heading of 300° degrees and passed Traffic Information on the PA28. The pilot of the LJ75 confirmed that he could see the PA28 on TCAS (Figure 5).

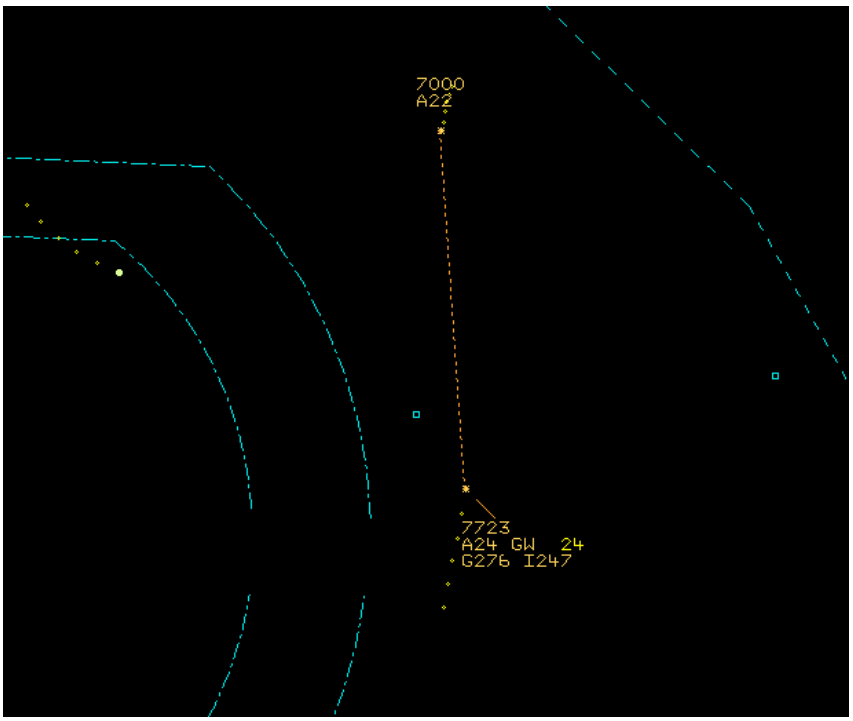


Figure 5 – 1440:45 – with LJ75's Ground & Indicated Air Speeds annotated.

At 1441:20 the controller asked the LJ75 pilot if he was visual with the traffic to which the LJ75 pilot responded by reporting a TCAS RA (Figure 6).

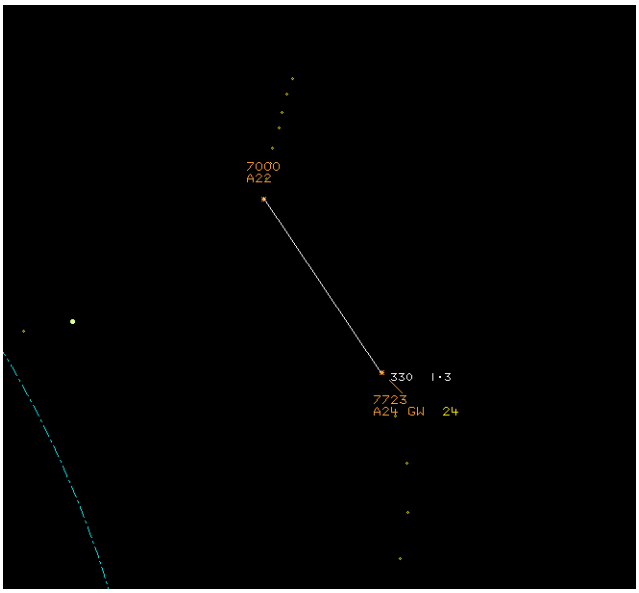


Figure 6 – 1441:20.

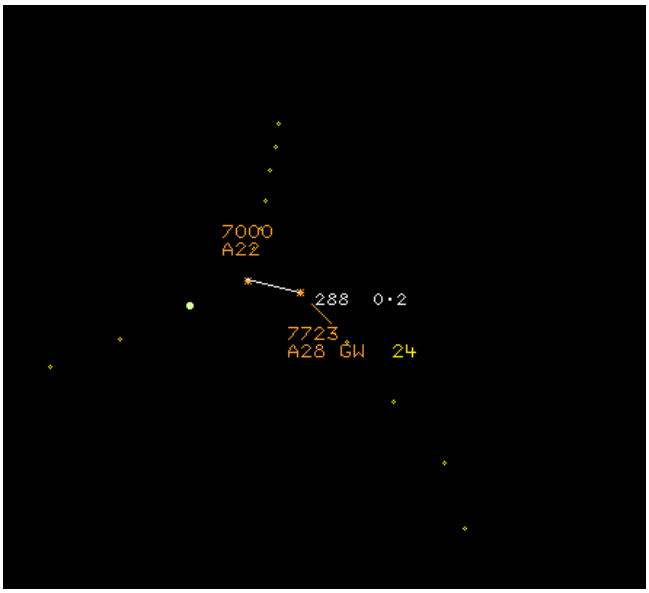


Figure 7 – 1441:31.

CPA was assessed to be at 1441:31 with the aircraft separated by 600ft vertically and 0.2nm horizontally (Figure 7). The LJ75 was observed in a climb to 3000ft although then descended almost immediately to 2800ft after the CPA.

The original request by the pilot to go low-level with a radar service was communicated by the Biggin Hill Aerodrome controller when they first requested a departure clearance from Thames Radar. The pilot's intention was probably to reduce the track miles flown, as a standard IFR Biggin-Hill departure would have required the aircraft to have flown via DET, LAM and BPK VORs. The more direct routing was agreed by the Thames controller on duty at the time. There was then a change of controllers and this routing was included in the handover between the controllers. At interview, the Thames controller confirmed that the plan had been to try and route the LJ75 pilot as direct as possible to Luton, by transiting the London City CTR. However, by the time the LJ75 was airborne, the traffic situation had changed, and the Thames controller had already decided to route the LJ75 around to the east and north of the CTR. This was agreed with the pilot of the LJ75 who, on first contact, confirmed that he was in IMC. However, the controller stated at interview that this had not changed the plan, as the routing and level were both terrain-safe. The controller also believed that providing the pilot with vectors under a Traffic Service, would allow him to integrate better with the two London City IFR inbounds which he would also be controlling. The controller was aware of the traffic in the vicinity of Stapleford and it was his intention to cut through the north-eastern corner of the London City CTR to avoid that traffic. That part of the London City CTR was within the "Co-ordination Area" and it was a requirement that any requests to enter this area were coordinated with London City Tower. This was to protect London City RW27 departures which all turn right.

The controller stated that it had been his intention to initiate this coordination by telephone with London City just after having turned the LJ75 pilot on to the 010° heading. However, this was delayed by the first call of the second London City inbound at 1439:50.

The coordination was initiated at 1440:20, but just as the telephone-call was being terminated, the Amber STCA was initiated on the controller's radar display. In accordance with the original plan, the controller then turned the LJ75 pilot left but this effectively turned the aircraft into direct confliction with the PA28.

The LJ75 pilot had reported being IMC on departure, and the controller did not confirm if this was still the case before asking him if he could see the conflicting PA28. The pilot did not answer the

question but instead reported receiving a TCAS RA. No formal avoiding action advice was given by the controller. When asked why they had not considered turning the LJ75 pilot right, the controller agreed that it would have been a better plan, although it would have infringed the Southend CTA, but he did not believe that this was a barrier to him considering that option at the time. He also admitted that, with hindsight, he could also have instructed the LJ75 pilot to climb. The controller believed the original plan to have been the right one, but wrongly executed. He also admitted that he had underestimated the speed of the LJ75 and consequently the radius of turn when given.

The controller had only recently qualified, just over a month prior to this incident, his first operational sector since initial training. He reported, subsequently, being advised by more experienced controllers, that many would have not agreed to the low-level routing. Rather, the pilot would have been refused the request and asked to fly in accordance with its original flight-plan. Alternatively, the aircraft could have been allowed to continue under its own navigation and/or passed to Farnborough LARS for the transit at low-level to Luton.

CAP774[4] advises pilots that:

> 'A Traffic Service might not be appropriate for flight in IMC or where lookout is significantly constrained by other factors, when other ATSs are available". Similarly, controllers are advised "When providing headings/levels for the purpose of positioning and/or sequencing or as navigational assistance, the controller should take into account traffic in the immediate vicinity based on the aircraft's relative speeds and closure rates, so that a risk of collision is not knowingly introduced by the instructions passed. However, the controller is not required to achieve defined deconfliction minima and pilots remain responsible for collision avoidance even when being provided with headings/levels by ATC.'

UKAB Secretariat

The LR75 and PA28 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard[5]. Because the incident geometry is considered as converging then the LJ75 pilot was required to give way to the PA28[6].

Summary

An Airprox was reported when an LJ75 and a PA28 flew into proximity at 1441 on Friday 8th January 2016. The LR75 pilot was in receipt of a Traffic Service from Thames Radar and the PA28 pilot was in the process of requesting a Basic Service from Farnborough. The inexperienced Thames Radar controller issued the LJ75 pilot with a turn, but misjudged the radius of the LJ75's turn, resulting in it conflicting with the PA28. The LJ75 pilot received a TCAS RA and climbed into CAS. The PA28 pilot reported that he had seen the LJ75 at a range of 5nm. The minimum recorded separation was 600ft vertically and 0.2nm horizontally.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from both pilots, the controllers concerned, area radar and RTF recordings and reports from the appropriate ATC and operating authorities.

The Board first discussed the actions of the LJ75 pilot and whether it had been prudent for him to have requested to proceed under IFR, and initially in IMC, outside CAS. A Civil pilot member commented that, from his experience, the view from the cockpit of an LJ75 is very narrow and restrictive, making it difficult to readily sight any conflicting traffic. The Board noted that the LJ75's Mode S return showed that shortly before the CPA its Ground Speed was 276kt (247kt indicated). The Board opined that, although realising that the pilot had wished to route as quickly as possible to destination, which was why he had opted to take a more direct route outside CAS, it would probably

[4] Chapter 3. Traffic Service, Paragraphs 3.3, 3.6.
[5] SERA.3205 Proximity.
[6] SERA.3210 Right-of-way (c) (2) Converging.

have been prudent, whilst flying in a busy see-and-avoid environment outside CAS, to have continued at a slower speed. This would have allowed him more time to see any traffic and, in this instance, to be able to turn onto the controller's heading without such a wide radius of turn; pilot members commented that the LJ75 could easily perform capably at speeds as low as 180kt. The Board also wondered why the crew had needed to listen to the ATIS on such a short flight when there would have been no significant changes in the period. The Board opined that this could have been an unnecessary distraction from keeping a good look-out.

The Board then turned its attention to the actions of the Thames Radar controller. It was noted that a previous controller had accepted the LJ75 pilot's request to route from Biggin Hill to Luton IFR 'radar-to-radar' outside CAS because there had been no traffic to affect it at the time. The controller position had then been handed over, and the routeing for the LJ75 had been accepted by the oncoming controller. The NATS advisor commented that the oncoming controller was inexperienced, it was his first posting, and that he had only been validated for about a month. The Board was sympathetic in that he had been handed over a situation that he may not have experienced previously, and that his inexperience may also have meant he found it difficult to challenge and change a plan that had been accepted by the previous experienced controller. Once airborne, the controller provided the LJ75 pilot with a Traffic Service and informed the pilot that his intention was to route him clear of London City's airspace to the north. Subsequently, the controller, being aware of unknown traffic in the vicinity of Stapleford (the PA28), had contacted London City (albeit later than intended due to operational matters), for clearance for the LJ75 to enter their airspace, which had been agreed. However, by the time the controller had issued the LJ75 pilot with the turn, it resulted in it tracking towards the unknown traffic, probably because the controller had misjudged the aircraft's speed and radius of turn. The Board noted that Traffic Information had then been issued to the LJ75 pilot who also received a TCAS RA to climb, which resulted in the aircraft entering CAS allocated to Thames Radar. Civil Controller members, although taking into account the inexperience of the controller, said that there were other options rather than trying to turn the LJ75 towards the PA28; specifically, climbing the aircraft into the CAS controlled by Thames Radar.

The Board then discussed the cause of the Airprox. The Board noted that the heading issued to the LJ75 pilot had resulted in it turning towards, and into conflict with, the PA28. This was contrary to the procedures for a Traffic Service whereby a risk of a collision must not knowingly be introduced by heading instructions issued when providing the service. Accordingly, the Board decided that the cause of the Airprox was that the Thames controller vectored the LJ75 into conflict. Members also noted that it was for the LJ75 pilot to give way to the PA28, on his right. The PA28 would have been displayed as proximate traffic on the LJ75 TCAS and, had he detected the impending confliction, the LJ75 pilot could have requested specific Traffic Information on the PA28, to aid visual acquisition, or have delayed his turn towards the PA28, thereby discharging his responsibility not to operate in such proximity to other aircraft as to create a collision hazard.

The Board then turned its attention to the risk. The PA28 pilot reported that he had seen the LJ75 at a range of 5nm, and the LJ75 pilot had climbed in reaction to a TCAS RA, which had resulted in the vertical separation at CPA of 600ft. Accordingly, Board members quickly agreed that there had been no risk of collision and therefore assessed the risk as Category C.

The Board welcomed the initiative of the LJ75's company in producing a briefing for their pilots if they were involved in ferry flights between airports in the London area (Annex A). However, it was noted that there were errors in the brief. Firstly, line 3 states that a radar–to-radar service is a flight under radar control (RCS) in uncontrolled airspace - RCS is only available in CAS; secondly, lines 10/11 state that there are 4 types of radar service, including Basic and Procedural. A Basic Service does not necessarily involve radar, and a Procedural Service is provided when radar is not available.

PART C: ASSESSMENT OF CAUSE AND RISK

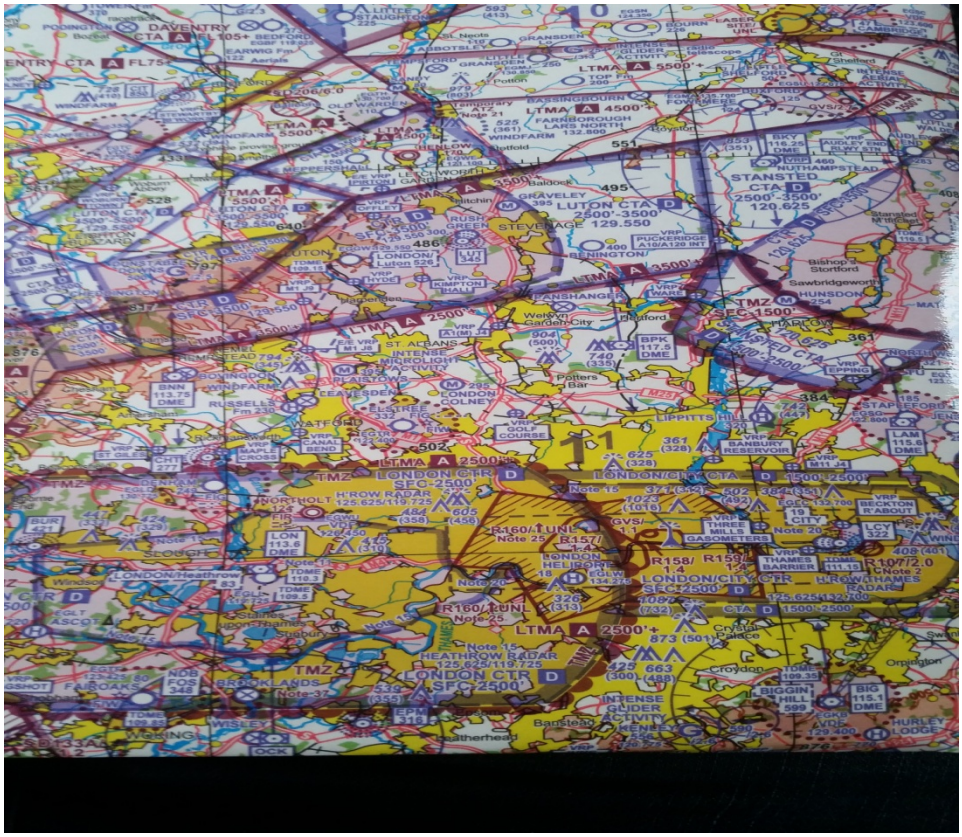
Cause: The Thames controller vectored the LJ75 into conflict.

Degree of Risk: C.

LJ75's company briefing concerning flights in uncontrolled airspace.

'Occasionally there is a need to position the aircraft between London airports and the flight plan can be as long as 35mins for flights which are only 20nm. To avoid these excessive flight times there is an option to fly a radar to radar service which is a flight under radar control in uncontrolled airspace. These flights are usually between Luton and Biggin Hill, Luton and Farnborough and Biggin Hill and Farnborough.

Below is the VFR Chart for southern England a full map is found on board the aircraft.



The Procedure for example from Biggin Hill to Luton would be to expect something as follows, On start up with tower request a radar to radar service, the tower will then issue the clearance with will usually involve complying with the SID until talking to the next radar frequency which will then usually give you radar vectors around the London TMA, once clear and handed over to Luton, the approach controller will usually give you a climb into controlled airspace. The controller will request what type of radar service is requested, there are 4 types of radar service in the UK;

Deconfliction

provides the pilot with traffic information and deconfliction advice on conflicting aircraft. However, the avoidance of other aircraft is ultimately the pilot's responsibility. A Deconfliction Service contains the information available in a Basic Service. In addition, controllers shall aim to assist the pilot with his responsibility for the safety of the aircraft by passing traffic information and deconfliction advice. Headings and/or levels will also be issued for positioning, sequencing and/or deconfliction advice

Traffic Service

provides the pilot with surveillance derived traffic information on conflicting aircraft. No deconfliction advice is passed and the pilot is responsible for collision avoidance. A Traffic Service contains the information

available in a Basic Service. In addition, controllers provide surveillance derived traffic information on relevant conflicting traffic. Headings and/or levels may also be issued for positioning and/or sequencing.

Basic Service

is intended to offer the pilot maximum autonomy and the avoidance of other traffic is solely the pilot's responsibility. The controller/FISO will pass information pertinent to the safe and efficient conduct of flight. This can include weather, changes of serviceability of facilities, conditions at aerodromes and general activity information within a unit's area of responsibility.

Procedural service

is a non-surveillance service in which deconfliction advice is provided against other aircraft in receipt of a Procedural Service from the same controller. The avoidance of other aircraft is the pilot's responsibility.

More information for flying outside controlled airspace can be found here
http://publicapps.caa.co.uk/docs/33/20130121SSL08.pdf

http://airspacesafety.com/atsocas/

Pilots must remember that in uncontrolled airspace they are responsible for separation.

Pilots must be aware that other traffic can include jet aircraft also positioning radar to radar, light aircraft with no radio or transponder (clear VFR days) Gliders, military fast jets, balloons etc.'