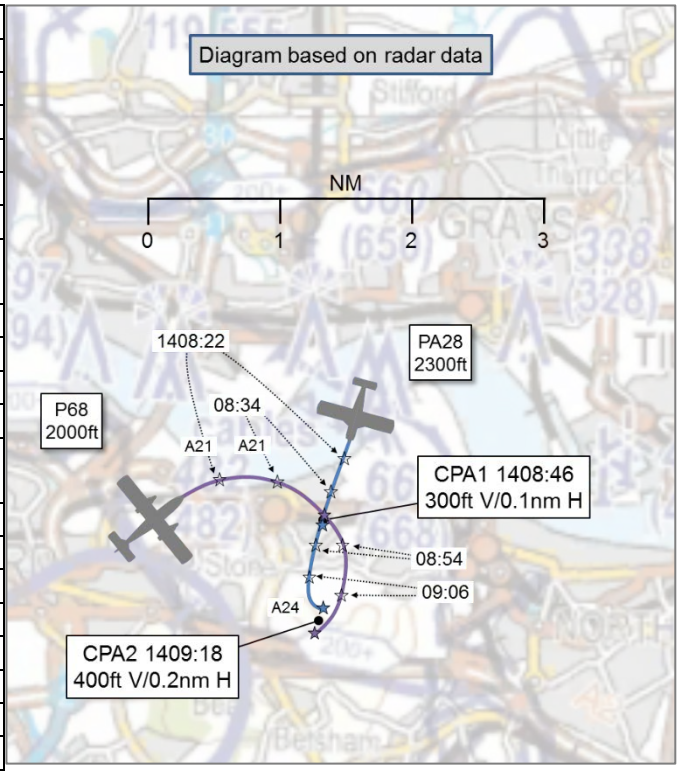
AIRPROX REPORT No 2019226

Date: 05 Aug 2019 Time: 1409Z Position: 5127N 00018E Location: Tunbridge Wells VRP

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	P68	PA28
Operator	Civ Comm	Civ FW
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	Basic	Basic
Provider	Thames Radar	Farnborough LARS N
Altitude/FL	2000ft	2300ft
Transponder	A,C,S	A,C,S
Reported		
Colours	White	White/blue
Lighting	Red beacon, nav, taxi, landing	Nav, landing
Conditions	VMC	VMC
Visibility	35km	15km
Altitude/FL	2300ft	2300ft
Altimeter	QNH (1010hPa)	QNH (1019hPa)
Heading	270°	180°
Speed	110kt	85kt
ACAS/TAS	Not fitted	Not fitted
Separation		
Reported	150ft V/0nm H	150ft V/300m H
Recorded	400ft V/0.2nm H (CPA 2) 300ft V/ 0.1nm H (CPA 1)[1]	



THE PARTENAVIA P68 PILOT reports that he was carrying out a survey in congested airspace. He was just southwest of Dartford at 2300ft in a right-hand orbit (holding to re-enter after), as requested by Heathrow Special VFR [Thames Radar]. They observed what looked like a PA28 at less than 400m in about their 2 o'clock. Had he not entered a dive urgently, both aircraft may have hit. They passed under the other aircraft about 100-200ft below. He commented that the importance of a good lookout, and using the second crew for additional lookout, was paramount.

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

THE PIPER PA28 PILOT reports that he was cruising slowly south over the River Thames and was about to make a 180° left turn. An aircraft was spotted in roughly their 2 o'clock, heading towards him, slightly below. He decided that the safest course of action was to increase speed and climb so that the other aircraft would pass behind and below. He waited for the aircraft to pass before commencing a left 180° turn. He commented that his whole route was in congested airspace so he was always on the lookout.

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

THE FARNBOROUGH NORTH LARS CONTROLLER reports that, unfortunately, due to the time elapsed before he was notified of the Airprox, he did not recall the particulars of the session in question. [UKAB informed Farnborough ATSU of the Airprox on the 19th September once the PA28 had been identified].

[1] The P68 pilot filed the Airprox following CPA 2; he was not visual with the PA28 at CPA 1. The PA28 pilot's report referred to CPA1.

THE THAMES RADAR CONTROLLER reports that he had no recollection of the event and did not notice an issue at the time because it was not reported on the R/T.

Factual Background

The weather at Biggin Hill was recorded as follows:

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METAR EGKB 051350Z 22011KT 190V260 9999 SCT045 22/14 Q1010=
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Analysis and Investigation

UKAB Secretariat

The P68 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[2]. If the incident geometry is considered as converging then the PA28 pilot was required to give way to the P68[3] at the initial crossing point CPA1.

The Manual of Air Traffic Services, Part 1[4] states that pilots must be advised if a service commences, terminates or changes when entering or leaving CAS.

NATS Farnborough Investigation Report.

It is NATS policy to provide a single investigation report for all NATS units involved. However, in this instance the NATS report contained no information regarding the Farnborough involvement because an in-house NATS delay meant that notification did not get to Farnborough in time for them to retain any RT recordings and so there was little of value that could be added from the Farnborough perspective.

NATS Swanwick Investigation Report.

The P68 pilot was conducting a survey flight on an east-west track to the south of London City, which took place partially outside Controlled Airspace. Whilst established on the Thames frequency the P68 came into close proximity with the PA28 which was operating outside Controlled Airspace. There was no report of an Airprox made to the controller who was providing the P68 pilot with a service at the time, however, the pilot subsequently filed an Airprox report on the event.

The P68 pilot contacted the Thames Radar controller at 1231:46 (all times UTC) to request Zone entry to the London City Control Area (CTA) for a survey flight. The pilot was issued a clearance to enter the zone, VFR, not above 2400ft at 1233:44. He reported he would be conducting a survey by flying east-west tracks, crossing the boundary of Class D to Class G, and therefore being outside Controlled Airspace on the eastern portion of each run. Figure 1 shows the approximate turn/hold area that the P68 occupied with straight east-west runs being made between the two.

[2] SERA.3205 Proximity.
[3] SERA.3210 Right-of-way (c)(2) Converging.
[4] Section 1, Chapter 6, Page 2, ATS Surveillance Systems.

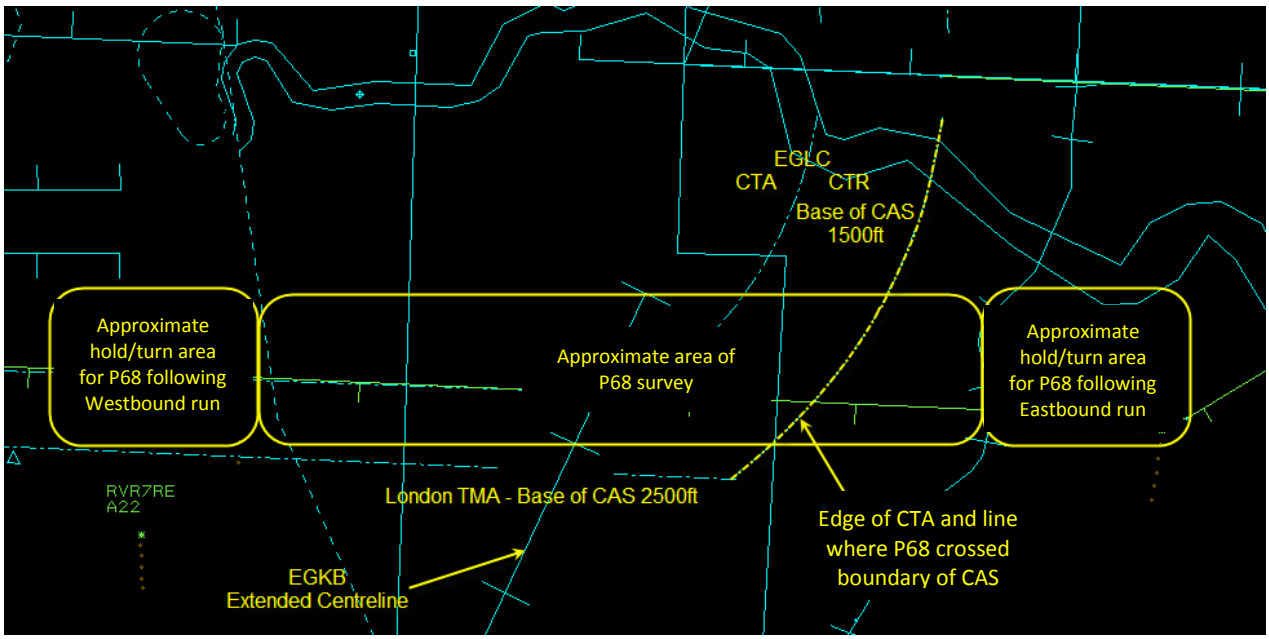

Figure 1.

The Thames Radar controller informed the P68 pilot that they may have to hold before commencing a run at some points during the flight, due to inbound traffic. The aircraft entered the London City CTA and the pilot was issued a Radar Control Service at 1235:52, with the strip being marked accordingly. The pilot continued with their tasking, completing a number of planned runs during a period of more than one hour and thirty minutes. During this period the pilot was requested to hold, prior to commencing the next run, on a number of occasions. Also, during this time there were two controller handovers, the first at 1259 and the second at 1405. At no time as the aircraft entered or left Controlled Airspace was the service changed from Radar Control Service by any of the subsequent controllers.

At 1402:12, after completing 12 runs, the pilot requested to restart the eastbound run which they had commenced shortly before. The controller approved this, stating they could return to the beginning of the run, although they would need to hold before recommencing. The aircraft however continued on the easterly run. A second crewman on board the P68, subsequently questioned what they had been cleared for. This crewman stated that they were heading to the end of that run and were going to hold. The controller approved this course of action because holding at either end would keep the aircraft clear of a Biggin Hill arrival.

The P68 left the London City CTA, and therefore left Controlled Airspace, at 1405:14. There was then a controller change, with the new controller being in place and beginning their first transmission at 1406:18. Shortly before this transmission, the P68 was at 2100ft and the PA28, which was displaying mode A code 5020 and tracking in a southerly direction. was at 2200ft. The 2 aircraft were 4.9nm apart. See Figure 2.

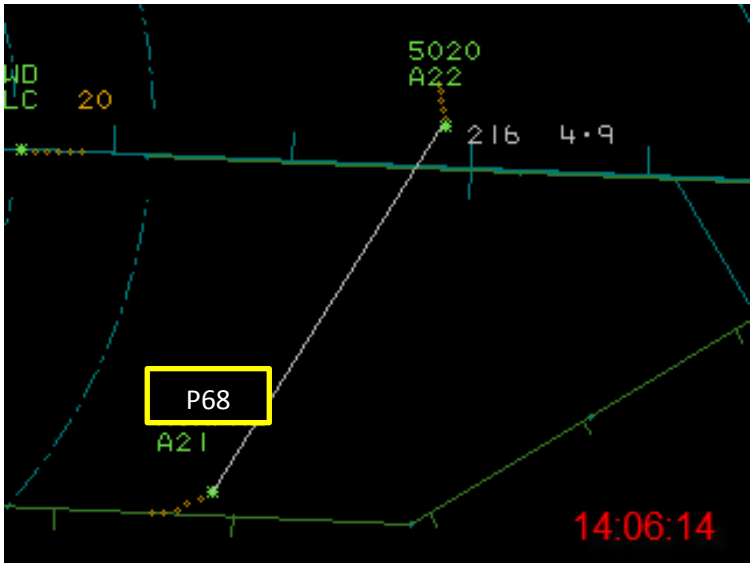

Figure 2. Squawk 5020 PA28.

Whilst the P68 was holding in a right-hand orbit outside Controlled Airspace, Low Level Short Term Conflict Alert (STCA) activated with a Biggin Hill inbound at 1407:13, see Figure 3. Traffic information on the P68 was passed to the pilot of the Biggin inbound five secs later, as STCA deactivated.

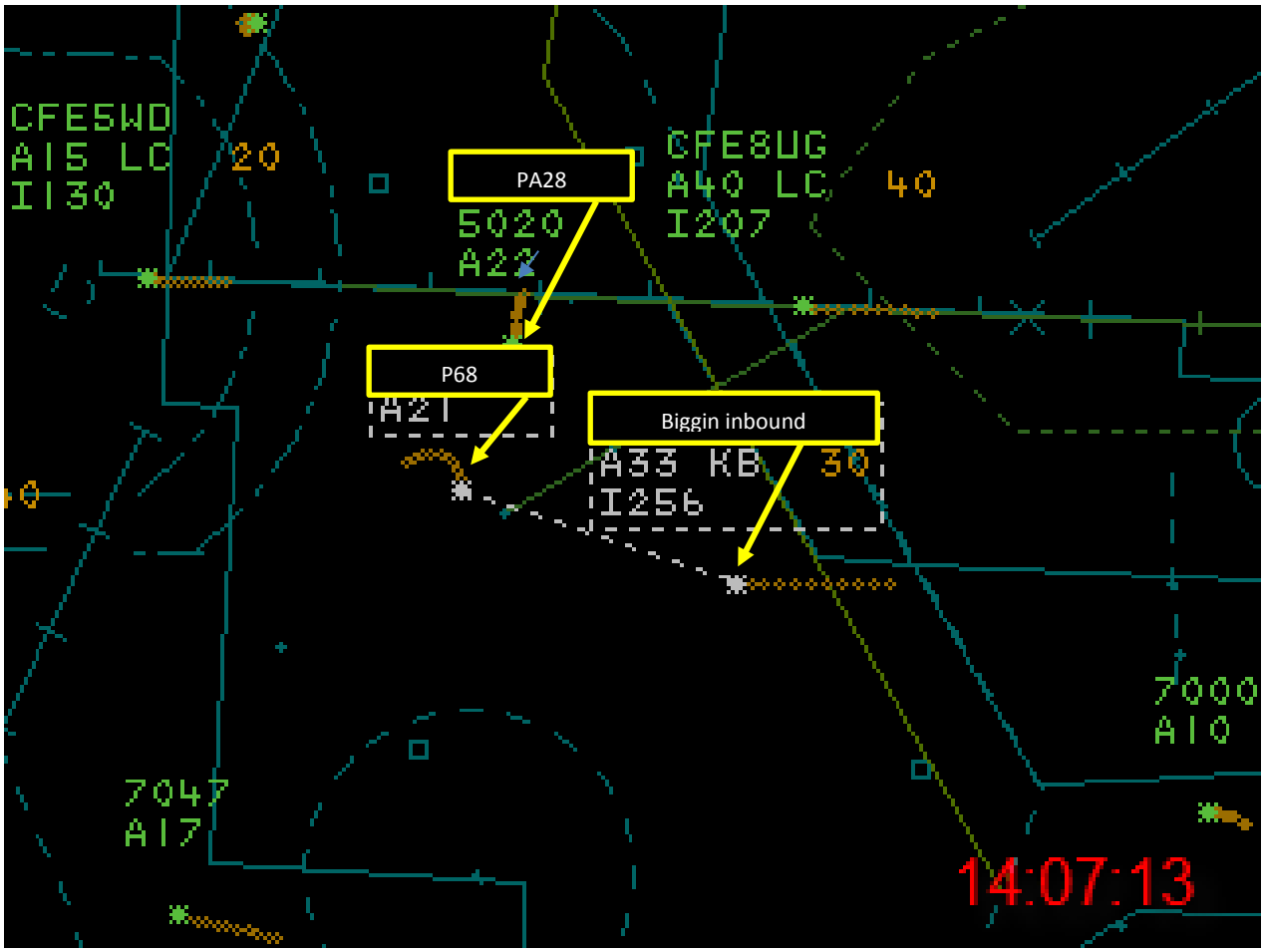

Figure 3.

At this point the PA28, indicating altitude 2200ft was 2.8nm north of the P68, tracking in a southerly direction. The controller then continued to issue instructions to other aircraft during a busy period on the sector. The P68 continued holding in a right-hand orbit, whilst the Biggin Hill inbound was issued further instructions for the approach at Biggin Hill. The P68 subsequently came into close proximity to the PA28 during this orbit, passing 0.1nm behind and 300ft below, Figure 4.

NATS ATSI Note: Figure 4 shows a screenshot of CPA1 from the Node Replay system, Figure 5 shows a screenshot from the Thames Radar controller's radar display at this point illustrating the clutter and overlap of the P68/PA28 information.

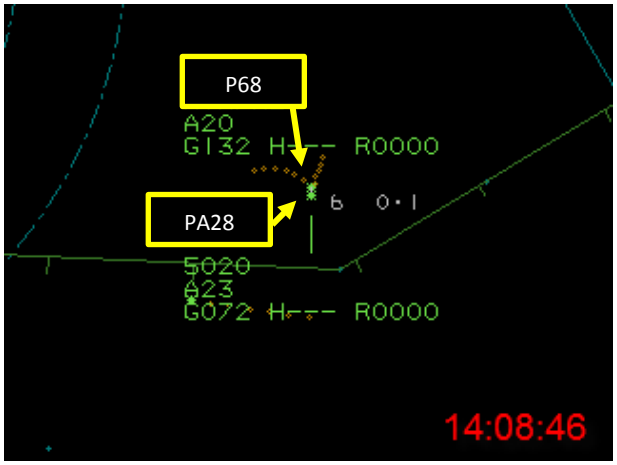

Figure 4. CPA1.

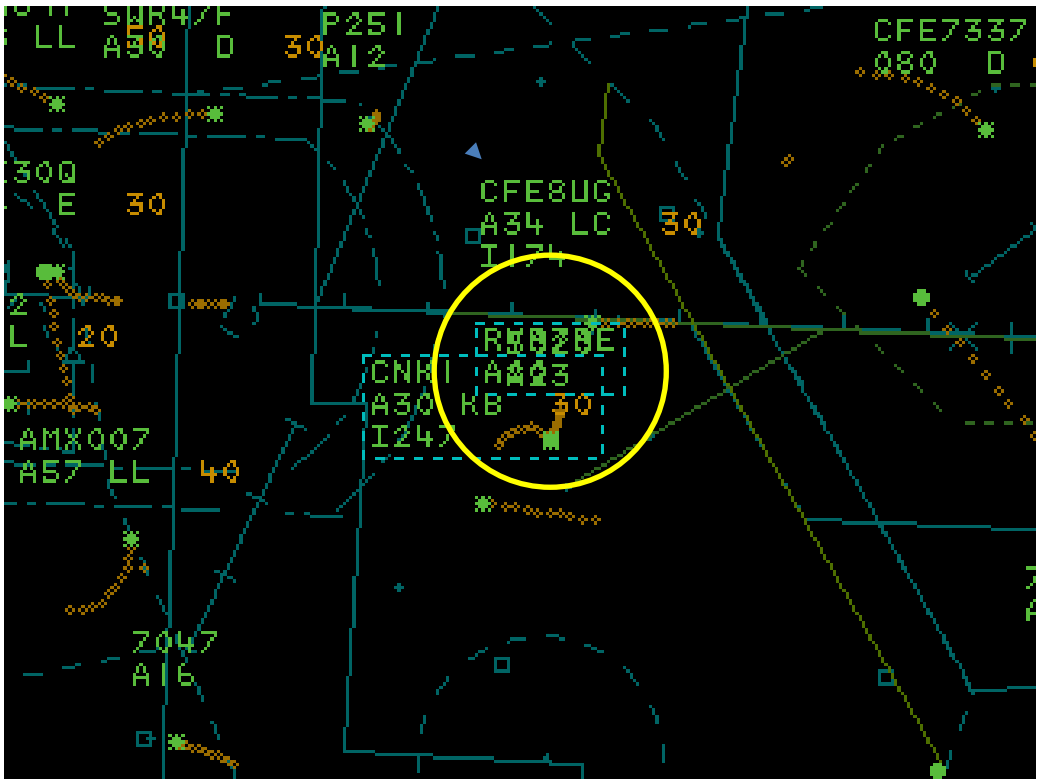

Figure 5. (P68/PA28 callsigns overlapping.)

The Mode C of the P68 changed from indicating 2100ft to 2000ft on the radar sweep prior to CPA1; however, the extrapolated descent rate remained at 0fpm throughout. After passing behind the PA28, the P68 continued in the right-hand orbit, turning back towards the PA28 and coming into close proximity for a second time at CPA2, passing in front of the PA28 at a range of 0.2nm and 400ft at 1409:18, see Figure 6.

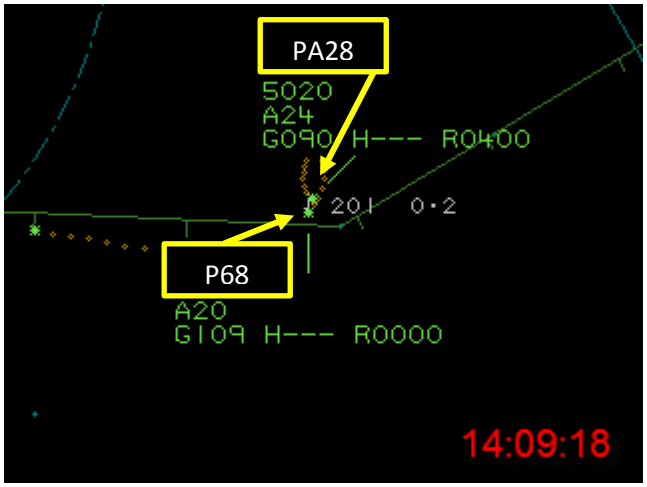

Figure 6. CPA2.

The Thames Radar controller then transmitted to the P68 pilot that they were clear to commence their next westbound run at 1409:26, which the pilot acknowledged. This run was completed, followed by a further eastbound run before the pilot reported that they had completed their tasking and were heading to Rochester to carry out a survey in that area. The controller then agreed a Basic Service outside Controlled Airspace with the pilot and requested that they report leaving the frequency. The pilot subsequently reported leaving the frequency for Southend at 1421:17, thanking the controller for their help. The P68 pilot made no reference to an Airprox whilst on the Thames Radar frequency.

Because the flight would be making multiple runs, and therefore having the service changed on multiple occasions, some controllers who routinely handle these types of flights have adopted a practice of agreeing with pilots, from the outset, that they would be under a Radar Control Service whilst inside Controlled Airspace and a Basic Service whilst outside. This practice however varies from controller to controller, with some not employing it. The controller who was in position at the time of the Airprox reported that they would normally agree a *"Radar Control Service inside Basic Service outside Controlled Airspace"* with the pilot at the commencement of the survey and assumed it had been agreed in this case. The P68 pilot's report stated that they believed they were in receipt of a Basic Service at the time of the Airprox.

The Thames Radar controller commented that since the event they had been careful to re-iterate the type of service being provided to the pilots of similar flights, when taking over a position. The controller stated that whilst the service being provided can be manually input into EXCDS, there is no quick way to show Radar Control Service inside and Basic Service outside Controlled Airspace.

The investigation methodology led this report to conclude that the event was NATS Causal. However, the pilot's report stated that they believed they were in receipt of a Basic Service at the time of the Airprox. Given this fact, it should be noted that there are causal elements in this event other than the Thames Radar controller. Rather, the actions of the controller were contextual in an event which was a conflict resolved by see-and-avoid in Class G airspace.

Summary

An Airprox was reported when a P68 and a PA28 flew into proximity near Tunbridge Wells at 1409hrs on Monday 5th August 2019. Both pilots were operating under VFR in VMC, the P68 pilot in receipt of a Basic Service from Thames Radar and the PA28 pilot in receipt of a Basic Service from Farnborough LARS N.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots, area radar and R/T 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 noted that both pilots were operating under VFR, in receipt of a Basic Service, the PA28 from Farnborough LARS N and the P68 from Thames Radar, although this service had not been agreed at the time. Because an Airprox was not reported on the Farnborough or Thames frequencies at the time, the controllers involved had no recollection of the event when subsequently advised that an Airprox had been filed. Consequently, they were not able to complete a report. The Board reiterated the value of informing ATC of any Airprox as soon as possible so that controllers and other pilots could preserve any information and make notes as appropriate.

The Board first discussed the actions of the Thames Radar controller. The P68 pilot had been carrying out a survey flight to the south of London City airport, which involved entering and leaving CAS. When entering CAS on his first flight the pilot was informed that he was under a Radar Control Service. However, during subsequent changes of entering and leaving CAS, the type of service being provided to the P68 pilot was not advised. In accordance with the procedures stated in the Manual of Air Traffic Services, Part 1 (**CF1**) this information should have been advised to the pilot. During the survey, which encompassed 12 runs, the controller position had changed on 2 occasions. The controller who was in position at the time of the Airprox assumed that the P68 pilot had been advised that he would be provided with a Radar Control Service inside CAS and a Basic Service outside because this was a common method of operation at Thames Radar. However, on both controller handovers, no mention had been made about any agreement with the P68 pilot on the types of service being provided. Nevertheless, the Board noted that it appeared that the P68 pilot believed that he was in receipt of a Basic Service because that was the ATS he had stated in his Airprox report.

In the period leading up to the Airprox, the P68 pilot had completed an eastbound track and had been instructed to hold, taking up a right-hand orbit in the agreed position to the southeast of London City airport, outside CAS. Shortly after the last controller handover in the period, Short Term Conflict Alert (STCA) activated momentarily between the P68 and a Biggin Hill inbound aircraft. At the time the PA28, at 2200ft, was 2.8nm north of the PA28 tracking south. The P68 was in a right turn at 2100ft. About 90 seconds later the P68, still in a right-hand orbit, passed 0.1nm behind the PA28 and 300ft below, CPA1. Vertical separation had increased because the PA28 pilot had seen the P68 and had climbed to avoid. The P68 pilot did not see the PA28 at this time. Although under a Basic Service there was no requirement to monitor the progress of the two aircraft (**CF2**),some members wondered why the controller had not noticed their close proximity, especially because he would have turned his attention to the position of the P68 after STCA had activated. A Civil Controller member commented that because the PA28 was only showing its squawk and not a code/callsign conversion its SSR label would not have been readily noticeable to the controller. It was also noted that STCA had not activated between the subject aircraft, either at this time or, subsequently, when the two aircraft came into close proximity after the P68 had continued his right-hand orbit. The NATS advisor commented that, to reduce the amount of nuisance alerts for the Thames radar controller, certain squawks are filtered out from the STCA system and this was the situation between these 2 aircraft (**CF3**).

On the subsequent CPA2, which occurred approximately 30secs after CPA1, the radar recordings show the P68 passing in front of the PA28 at a range of 0.2nm, 400ft below. This time the P68 pilot saw the PA28, and descended to avoid. The PA28 pilot confirmed later that he had retained visual contact with the P68 throughout and was not unduly perturbed because he could see that the P68 was below him. The Board noted that 2 Airprox had occurred: in the first encounter the PA28 pilot had seen the P68 but the P68 pilot had not seen the PA28; in the second encounter both pilots were in visual contact with each other as the P68 turned towards the PA28 from behind, albeit the P68 pilot only at a late stage. The 2 pilots' description of events and estimates of separation thus applied to different CPAs. Notwithstanding, both CPAs had similar separations, and in both encounters at least one of the pilots was visual with the other aircraft at all times.

Because neither controller issued Traffic Information to either pilot and they had been operating on different frequencies, the pilots had no situational awareness of the other aircraft (**CF4**). The P68 pilot only became aware of the PA28 when he saw it at a range of less than 400m (**CF5**), by which time he was concerned by the proximity of the other aircraft (**CF6**).

The Board then debated the risk within this incident. Some members initially believed that the risk was Category B (safety much reduced below the norm) for both encounters, and especially the second encounter where the P68 had seen the PA28 fairly late. However, on further consideration they agreed with the majority that, although the two aircraft had been in sufficiently close proximity that safety had been degraded, both pilots had taken sufficiently timely and effective action in their separate cases such that 300-400ft height separation at the CPAs did not constitute safety being 'much reduced below the norm'. They also noted that the PA28 pilot had been visual with the P68 throughout and had reported the risk as only 'Medium' (he subsequently confirmed that he had been in contact with the P68 at CPA2, assessing that there had been no risk of a collision). For his part, although the P68 pilot had reported 'diving urgently' and a 'High' risk of collision in the second encounter, in achieving 400ft and 0.2nm separation, the Board felt that his perception of the risk may have been elevated by the surprise factor of suddenly seeing an aircraft in close proximity. Accordingly, the Board assessed the risk as Category C for both encounters; both pilots had removed the risk of collision in a timely and effective manner in the respective encounters in that they had seen the other aircraft.

Noting the non-sighting of the PA28 by the P68 pilot in the first encounter, and the subsequent late-sighting of the PA28 in the second encounter, the Board reflected on similar single-pilot survey incidents that had been reviewed during the meeting (Airprox 2019201, 2019208, 2019225 and 2019227) and resolved to recommend that 'The P68 operating company considers further mitigations to MAC for survey operations' and that 'The CAA considers mandating additional cockpit crew to enable enhanced lookout for single-pilot survey operations'.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2019226		
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	Contextual	• Situational Awareness and Sensory Events	Not required to monitor the aircraft under the agreed service
	• Electronic Warning System Operation and Compliance		
3		• Any other event	**STCA filtering**
	Flight Elements		
	• Situational Awareness of the Conflicting Aircraft and Action		
4	Contextual	• Situational Awareness and Sensory Events	Generic, late, no or incorrect Situational Awareness
	• See and Avoid		
5	Human Factors	• Monitoring of Other Aircraft	Late-sighting by one or both pilots
6	Human Factors	• Perception of Visual Information	Pilot was concerned by the proximity of the other aircraft

Risk of Collision: C

Recommendations:

1. The P68 operating company considers further mitigations to MAC for survey operations.
2. The CAA considers mandating additional cockpit crew to enable enhanced lookout for single-pilot survey operations.

Safety Barrier Assessment[5]

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 Thames controller did not inform the P68 pilot of a change of Air Traffic Service when entering or leaving CAS.

Flight Elements:

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because the P68 and PA28 pilots were not informed about the presence of the other aircraft and they were on different frequencies.

[5] 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 were assessed as **partially effective** because the P68 pilot saw the PA28 later than desirable (at a reported range of less than 400m).