AIRPROX REPORT No 006/07

Date/Time: 26 Jan 1825 NIGHT

Position: 5118N 00017E (9nm ESE BIG)

Airspace: LTMA (*Class:* A)

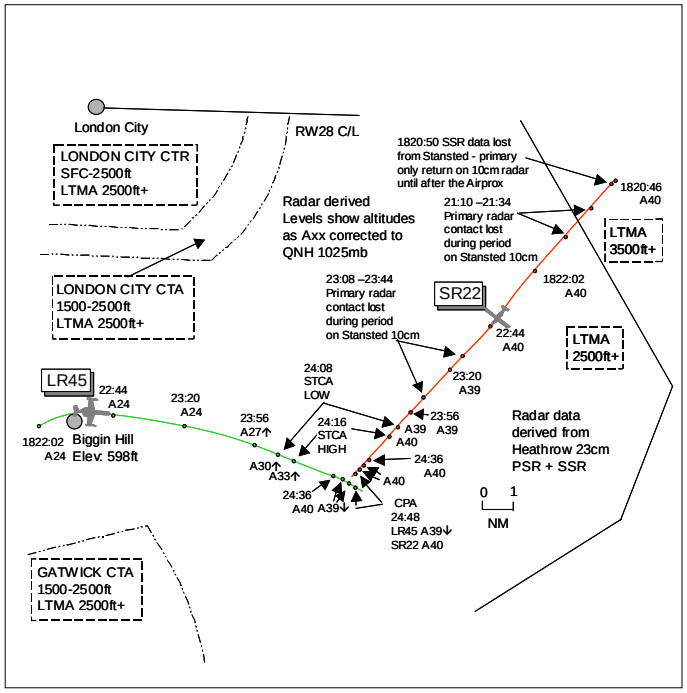
	Reporting Ac	*Reported Ac*
Type:	LR45	SR22
Operator:	Civ Comm	Civ Pte
Alt/FL:	↑5000ft (QNH 1023mb)	4000ft (QNH 1025mb)
Weather Visibility:	IMC KLWD	IMC IICL

Reported Separation:

'above'/down LHS 200ft V/0·4nm H

Recorded Separation:

100ft V/0·4nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE LR45 PILOT reports outbound from Biggin Hill IFR and in receipt of a RCS from London on 120·525MHz squawking an assigned code with Mode C. The Capt was conducting line training of a relatively inexperienced pilot. Previously whilst working Thames Radar at 3000ft, he thought [actually 2400ft], they were given climb to 5000ft, a radar heading and a frequency change. On first contact with London they were instructed to descend immediately to 3000ft. Simultaneously TCAS annunciated 'traffic traffic' so he disengaged the A/P and lowered the nose to reverse the 2500fpm ROC to approximately 1500fpm ROD. Reaching a maximum altitude of 3900ft QNH, TCAS gave 'adjust v/s' and in fact was asking for a higher ROD and this was when he caught a brief glimpse of the traffic slightly above going down their LHS; ATC then told them that they were clear of conflict. Workload was high during their departure phase and it was difficult changing from the climb profile to an immediate descent. He assessed the risk as high.

THE SR22 PILOT reports inbound to Biggin Hill IFR and in receipt of an ATS from Thames Radar on 132·7MHz squawking an assigned code with Mode C; TCAS 1 was fitted. The Airprox occurred whilst he was flying in cloud at 4000ft QNH 1025mb and 150kt following vectors for the ILS RW21 at Biggin Hill. He noticed on TCAS another ac closing in on his course below his level but climbing. TCAS gave a warning when the other ac was –200ft but at this time he broke clear of cloud and became visual contact with an approaching low wing jet. He was able to quickly assess that he would be clear of the other ac and collision was not immediate. After the very close passage TCAS indicated 0·4nm separation; at no point was he warned by ATC of any proximity with the incoming traffic. Since his TCAS was only capable of issuing traffic alerts he did not make any evasive manoeuvre. He assessed the risk as medium.

THE THAMES RADAR CONTROLLER reports that the Coordinator was busy so he called Biggin Hill in relation to an inbound ac, not the subject SR22. Biggin told him that they had not been passed an estimate on this inbound and that it could not commence an ILS approach owing to a departure in the ILS critical area. They offered a LLZ only approach which was subsequently accepted by the inbound flight whose pilot reported visual. During this telephone exchange the SR22 flight called on frequency and he acknowledged this call and on completion with Biggin Hill he instructed the SR22 flight to 'fly heading 230°' – the ac was about 4nm S of the extended C/L RW28 for London/City. The sector was busy and the Coordinator released the LR45 from Biggin Hill up to 2·4A towards DET and this flight was subsequently coordinated with TC S on a heading 115° and climb to 5A. He stressed

that the nature of operations within Thames Radar, by providing an approach service to ac into 2 aerodromes, means there are inbound and outbound fpss for both London/City and Biggin Hill displayed in the fps display. This makes it difficult to highlight conflictions. He opined that Thames Radar is a 'radar to strip' sector whereby ac painting on radar are correlated to a fps held in the display board. When the LR45 flight called on frequency he instructed the crew to squawk ident and, according to his radar and the correlating fps, there was another ac (AC3) NE of it at 4·0A heading SW. He turned AC3 to the N and descended it to 3·0A followed by climbing the LR45 to 5·0A and placing it on a heading of 115° as per the coordination. Other than AC3, there was nothing on the radar for him to correlate to a fps in his strip bay that would indicate a confliction with the LR45. He believed his actions were safe and transferred the LR45 flight to TC S on 120·525MHz. Shortly after this STCA started flashing red, high severity warning, indicating the LR45 and an intermittent primary contact. His colleagues on TC S shouted about the conflict however he and his Coordinator were perplexed as to why. There is a high rate of 'cry-wolf' STCA returns on Thames Radar because of the type of airspace (low-level with traffic below CAS up to 2·4A and traffic in CAS at 3·0A) and they believed that this occurrence was an example. He changed radar head to the Heathrow 23cm and all became clear. Later, prior to viewing a radar replay of the incident, he was adamant that nothing had been displayed on the radar or highlighted in his fps display to indicate a potential conflict with the LR45 – this was corroborated upon viewing the radar replay.

THE THAMES RADAR COORDINATOR reports the Thames RMA had traffic at both 3000ft and 4000ft inbound and outbound to London/City and Biggin Hill which included the SR22. Due to this he coordinated 5000ft and radar heading 115° from TMA SE for the LR45 departure from Biggin Hill. He told the Radar controller and marked the fps. After the LR45 became airborne, the Heathrow SVFR controller alerted the Thames Radar controller and himself to an STCA high severity alert to the E of Biggin Hill. Looking at the display only the LR45 was showing and there appeared to be no conflicting traffic in the vicinity.

THE LTCC BIGGIN RADAR CONTROLLER reports the sectors were split owing to a high volume of SE Low traffic. Being less busy than the TIMBA SC, she elected to work the LR45 from Biggin Hill which was treated as a Gatwick departure i.e. climbing to FL130 and a transfer to TC Capital. The LR45 was coordinated climbing to 5000ft and heading 115°. The flight was transferred to her climbing through 3400ft with STCA flashing 'red' against the SR22 into Biggin Hill which was under the control of Thames level at 4000ft. Her initial call to the LR45 flight was *"avoiding action turn right heading 180 degrees and descend immediately to altitude 3000ft"*. Her subsequent call was to pass TI on the SR22 and to re-emphasise the descent. Once the traffic had passed she climbed the LR45 to 5000ft; the flight did not at any time report a TCAS intervention.

ATSI reports that at the time of the Airprox, the SR22 flight was in communication with the TC Thames Radar controller whilst the LR45 flight had just been transferred from Thames Radar to the TC Biggin sector controller. The Thames Radar controller described both the workload and traffic situation as having been 'moderate'.

The area of responsibility for Thames Radar is defined, in the unit's MATS Part 2, as the London (City) CTR and CTA, the TC Thames RMA and TC airspace as delegated to Thames within 40nm of London City ATZ and 30nm of Biggin Hill ATZ, subject to the radar coverage of the equipment. At the time of the Airprox, a radar controller and a Coordinator were operating the Thames Radar sector.

The SR22 flight contacted the Thames controller at 1817:05, and reported descending to 4000ft on QNH 1025. At the time, the ac was approaching overhead Southend and passing 5900ft descending. Initially there was no response from the controller, as he was on the telephone to Biggin Hill, but he then acknowledged the pilot's call. The controller informed the pilot that he could expect radar vectoring for an ILS approach to RW21, at Biggin Hill, and then instructed him to fly a heading of 230°, which was acknowledged. At 1819:10, the controller asked the pilot to confirm that his cleared level was 4000ft, which he did. The ac was now passing 4900ft and located SW of Southend and N of the extended final approach to London City.

At 1822:45, the LR45 flight called the Thames radar controller, having just departed from Biggin Hill, and reported maintaining 2400ft following a BPK2, which required the ac to turn R after noise abatement and pass overhead the BIG VOR at 2400ft on track to DET and then BPK. The Thames controller instructed the crew to squawk Ident and, shortly afterwards at 1823:20, to climb to 5000ft heading 115°. At this time, the SR22, which was still heading 230°, was in the 11 o'clock position of the LR45, level at 4000ft and at a range of 9nm. The Thames controller asked the pilot of the LR45 to confirm his altitude to which he replied: *"Passing two thousand five hundred..."*. The controller then instructed the LR45 flight to contact London Control and report the heading.

At the time the crew of the LR45 was instructed to change frequency (1823:56) the ac was passing 2700ft, in the climb to 5000ft, with the SR22 in its 11 o'clock at a range of 5·3nm. Twenty-five seconds after being instructed to change frequency the pilot of the LR45 called the TC Biggin controller and reported *"London LR45 c/s's with you climbing to altitude correction now altitude five thousand feet heading one zero seven*". In the background the words "Traffic Traffic" can be heard from the TCAS. The TC Biggin controller immediately responded with *"LR45 c/s avoiding action turn right now heading one eight zero degrees descend immediately altitude three thousand feet descend now*". The radar recording shows that as this transmission was being made (1824:36) the SR22 was converging and in the 10 o'clock position of the LR45 at a range of 1·3nm with both ac indicating 4000ft. The LR45 commenced a descent and the SR22 passed 0·6nm behind the LR45 and 100ft above it.

[UKAB Note (1): The LR45 crosses through the SR22's 12 o'clock range 0·6m 100ft below with the CPA occurring on the next sweep (1824:48) as the LR45, at 3900ft, diverges ESE bound in the SR22's 10 o'clock rang 0·4nm which is at 4000ft.]

The Thames Radar controller took over the position at 1802, 22min before the Airprox. He reported that he was unaware that the Stansted 10cm radar was selected as this fact was not communicated to him in the handover. The radar selection is shown on the screen in an information box in the top R of the display, however, it is not particularly prominent and did not attract his attention. The unit MATS Part 2 states: *'The radar service(s) selected for use should normally be the most appropriate geographically sited, subject to satisfactory performance'*. It goes on to list the radar services available for Thames which are: Heathrow 23cm (Default picture), Stansted 10cm (Default Standby 1), Heathrow 10cm (Default Standby 2) and Debden (Default Standby 3). At the time the Debden radar was out of service due to long-term maintenance. The Thames controller advised that his first choice of radar selection would have been Debden but the Stansted 10cm was acceptable. The Heathrow 23 cm was frequently used but had poor coverage in respect of traffic around SPEAR and DET. In the opinion of the Thames controller, the Stansted 10cm radar provided generally good coverage. Immediately to the L of the Thames Radar position is a radar display for the London City Director, but on this occasion the Thames Coordinator was there. Immediately to the L of this position is the Heathrow SVFR control position. The Thames controller advised that the Heathrow SVFR controller must use either the Heathrow 23 or 10 cm radar, however, the MATS Part 2 does state that additionally, the Pease 23 cm and Gatwick 10cm radars may be used. He added that it varies from ATCO to ATCO as to whether the radar source used on the Coordinator/London City Director position is the same as that selected for Thames or a different one. Accordingly, the following ATSI recommendation is made: 'The unit should review and revise the MATS Part 2 entry regarding use of particular radars at operational positions. The revised entry should either indicate a priority of radar or provide sufficient guidance as to the coverage provided by each radar so that the controller can make an informed choice'.

The Thames controller described the split of duties between himself and the Coordinator as akin to the 'Planner and Tactical' concept. The Coordinator undertakes coordination, passes releases and handles telephone calls whereas the Thames Radar controller is responsible for achieving the agreed coordination with the ac involved. Estimates for flights inbound to Biggin Hill are passed by the ATSA. At 1816:50, the Thames controller answered the telephone line from Biggin Hill who advised that they had traffic, the LR45, shortly ready to depart. The Thames controller informed them that the next inbound, a C650, was at a range of 10nm but Biggin Hill had received no estimate on this. Due to the presence of the LR45 in the ILS sensitive area, Biggin Hill could not approve an ILS approach

for this inbound. Following discussion it was agreed that the C650 could either make a LLZ only approach or a visual one. The Thames controller said that this unexpected conversation distracted him somewhat.

The Coordinator had previously spoken to Biggin Hill regarding the departure of the LR45. The initial request for a release on the departure was made at 1813:30. The Coordinator contacted TC East who had agreed that the ac was released for departure. At 1818:00, the Coordinator telephoned Biggin Hill advising that the C650 was visual and would be making a visual approach. He added that subject to that ac the LR45 could depart on track to DET climbing to 2400ft, i.e. to remain beneath CAS and follow the track to DET.

The Thames Radar controller explained that his normal method for handling inbounds to Biggin Hill was to either vector the ac until it was parallel with the final approach for London City and then turn it L to intercept the LLZ for RW21 at Biggin Hill, or to vector it S of the extended C/L for RW28 at London City and turn it onto a heading of 275° and then turn such traffic Lt to intercept the ILS at Biggin Hill. Descent instructions would be issued commensurate with keeping the ac within CAS for the longest possible time. Analysis of the Stansted 10cm radar recording shows that the SR22 was visible on the radar when it first called and at the time that the Thames Radar controller instructed the pilot to fly a heading of 230° and confirm that the ac was descending to 4000ft. However, at 1820:50, when the SR22 was approximately 4nm S of the London City extended centreline, the SSR label disappeared from view leaving only the primary return.

At 1822:00, the SSR code from the LR45 appeared approximately 1nm W of Biggin Hill, but by now, the return from the SR22 was only an intermittent primary return. At 1822:30, the Coordinator telephoned TC South to coordinate climb on the ac. Both the Thames Radar controller and Coordinator emphasised that they, effectively have only two levels to use within their airspace and those are 3000 and 4000ft. London City outbounds depart on SIDs climbing to either 3000 or 4000ft and inbounds are transferred descending to 4000ft. Due to traffic already in the area, the LR45 flight had been given a clearance to climb to only 2400ft and thereby remain below the LTMA until it could be climbed further. With such traffic the objective was to climb the ac to 5000ft so that it would not conflict with inbound traffic to the Thames area and route the ac N'bound towards BPK. The Thames Coordinator agreed with TC S that the LR45 flight should climb to 5000ft heading 115° and this was written on the relevant fps displayed in front of the Thames Radar controller.

The LR45 flight established contact with the Thames Radar controller at 1822:45, when the SR22, still only visible as an intermittent primary return, was in the 11 o'clock position of the LR45 at a range of 13nm. The Thames controller instructed the LR45 crew to squawk Ident and, at 1823:20, to climb to 5000ft heading 115°. The Thames Radar controller did not comply with the requirements of MATS Part 1 (Section 1, Chapter 5, Page 9, Table 5) in that the crew were not told they were identified, passed their position or told what service they were under either when outside CAS or when they climbed into it. Almost coincident with the Thames controller instructing the LR45 flight to climb, the Coordinator received a telephone call from the TC Biggin SC advising that she would take the ac on frequency 120·52 if the ac had not yet been put over. The Coordinator confirmed the frequency and reiterated that it would be climbing to 5000ft. The Thames Radar controller asked the crew to verify their level, which they did, before instructing the crew to change frequency to the TC Biggin SC. At this time the LR45 was passing 2700ft with the SR22 in its 11 o'clock at a range of 5·3nm with the SR22 indicating 3900ft. Although the SR22 was only visible on the Stansted 10cm radar as an intermittent primary contact, it was clearly visible on the Heathrow 23cm, Heathrow 10 cm and Pease radars. STCA activated in low severity at 1824:08, before turning to a high severity alert 8sec later. The Heathrow SVFR controller, seated to the L of the Thames Coordinator, shouted a warning to the Thames Radar controller who could see the STCA warning but could not see what the traffic was to the LR45. The Thames Radar controller advised that STCA alerts were commonplace due to the system detecting 'conflictions' between ac operating at 3000ft within CAS and those operating at 2400ft or below, below CAS. This, in part, would act as a weakening of the immediacy of the problem as detected by STCA. Replay of the radar recording in 'slave' mode does show the STCA activate and highlight the SSR label of the LR45, but the conflict alert box shows the callsign of both ac

involved. However, it should be remembered that, by this time, the Thames Radar controller had instructed the crew of the LR45 to change frequency.

A discussion took place, with both the Radar controller and the Coordinator, with regard to fpss. A 4 bay display is provided and the third bay contains the active bay. The Thames Radar controller emphasised that the sector is a 'radar-to-strips' sector where strips are simply used to record administrative details and the controller works radar to strips. He opined that everything operating within the RMA was a potential conflict with traffic outbound from Biggin Hill. His way of operating was to arrange strips in the order that ac would arrive on the frequency. He did follow the practice of 'cocking out' strips to identify conflictions and he usually did this with Biggin Hill departures. However, in this instance he had not cocked out the strip relating to the LR45, as he hadn't identified any specific confliction. He had a strip on the SR22 but when he checked the radar, prior to issuing climb clearance to the LR45 flight, he had not seen anything in the way and so cleared the LR45 flight to climb.

The Coordinator advised that he had previously witnessed ac disappearing from the radar display, whereas the Radar controller was of the opinion that traffic did disappear for a short periods but not for any significant length of time. The SR22 disappeared from the Stansted 10cm radar at approximately 1820:50, and remained as an intermittent primary contact until a very short time after the Airprox occurred at 1824:50. The ac had been placed on a radar heading and so there was an obligation placed on the Thames Radar controller to monitor its progress. As the controller was employing a radar-to-strips methodology he did not detect any confliction between the SR22 at 4000ft and the departing the LR45, which had been cleared to climb to 5000ft. This over reliance on the use of radar at the expense of cross-referring to strips, colloquially known as 'black-holing', has in the past proved to be fallible. The fact that it was not unheard of for ac to disappear from the radar display, something that both the radar controller and Coordinator were aware of, reinforces the need to make full use of the information displayed on the flight progress strips. In conversation it would appear that this methodology is employed by a number of controllers when providing the Thames Radar service. Accordingly, the following ATSI recommendation is made: 'The unit should urgently revise the operational practices employed by Thames Radar controllers with regard to the usage of strips to enable a safe air traffic service to be provided'.

The unit (LTCC) carried out enquiries regarding details relating to the ac type involved, a Cirrus SR22. It was found that the transponder aerial is quite small and is located underneath the firewall between the two exhausts. What is somewhat paradoxical is that traffic which was squawking, at a lower level and a greater range than the SR22, from the Stansted Radar head, were displayed when the SR22 was not. However, as the other radars (Heathrow 23 & 10 cm and the Pease Pottage) all showed the SR22's transponder signal, it is clear that the equipment was functioning at the time. This then leads to the question as to whether the Stansted 10cm radar is suitable for the provision of a Radar Control Service in this area. A flight check, subsequent to the Airprox, indicated that the radar was performing within specification. Accordingly, the following ATSI recommendation is made: 'The unit should review the suitability of the Stansted 10cm radar as a radar source for the provision of ATS by Thames Radar controllers. If it is decided to continue with its use then controllers must be provided with information as to where areas of poor radar cover, and the associated altitudes, are located'.

Both the Thames Radar controller and the Coordinator expressed the view that the procedures associated with Thames Radar were produced some years ago and now, given the very significant increase in movements, are woefully out of date.

NATS OPERATIONAL ANALYSIS AND SUPPORT provided a TCAS performance assessment using Pease Pottage single radar source into an Interactive Collision Avoidance Simulator (InCAS). The simulation indicates that the LR45 crew would have received a TCAS TA at 1824:17 when the ac was climbing through FL030 (3300ft London QNH 1023mb) when the SR22 was 3·1nm away at FL037 (4000ft QNH). The subject ac continue to converge and as the LR45 climbs through FL034 (3700ft QNH) at 1824:27 a TCAS RA 'maintain v/s, crossing maintain' would have been generated

with the VSI green arc showing =>2500fpm (separation showing 2·08nm and 278ft). The LR45 continued to climb with the subject ac converging until at 1824:38 when separation shows 1nm and 100ft the simulation indicates that the LR45 would have been issued with a reversal RA 'descend' commanding a ROD between 1500-2000fpm. At this time the ac had already begun to reverse its flight profile indicating a slight ROD (300fpm). By 1824:42 the LR45 passes 0·65nm in front of and 100ft below the SR22, TCAS would have generated an 'increase descent' RA requiring 2500-3000fpm and 9sec later 'clear of conflict' would have been received. The CPA occurred at 1824:47 with LR45 now in the SR22's 1030 position range 0·42nm and 128ft below. The nature and the timings of these alerts were confirmed by Mode S messages collected by the RA downlink from the LR45. The InCAS also predicted that had the LR45 pilot's reactions to the initial TCAS command been ideal, the LR45 would have climbed through the level of the SR22 with vertical separation being about 610ft at the CPA.

NATS INVESTIGATIONS reports that immediately after the event the duty watch removed the Stansted 10cm radar from use by Thames Radar. The radar had been reported on several occasions in the past for poor performance and lost radar returns and with this in mind, engineering were tasked with carrying out a thorough investigation into the radar's performance. At the time, the radar was operating within specification but it was found that it had been operating with some suppression selected (RAG2 mode) since the beginning of the year. RAG2 is the highest level of suppression and, in conjunction with RAG1, is used to reduce false returns and lessen its susceptibility to weather. Looking at problems since May 2006, SSR failures were tracked down to a faulty Inductosyn circuit which was repaired. Poor PSR detection was found to be caused by a faulty T/R cell. Subsequently a number of reports about poor SSR performance over Luton and Detling were received but the majority of these were down to poor transponder performance which was demonstrated by similarly poor detection of the same ac by other radars. The number of reports over Luton may have been compounded further owing to an issue with turning data utilised by the Programmable GTC functionality. This anomaly has been resolved and the situation will be monitored pending any further reports regarding poor SSR performance in the Luton area. Other reports on poor PSR were analysed and it was found that other radars also struggled to track the same targets, this typically being due to the ac having low Radar Cross Section and outside the design parameters of the radar. Although there is a lack of ATC confidence in the Stansted Radar, there is no technical evidence to suggest the radar is performing below expectations.

Engineering also identified that the SR22 was a composite ac with a small Radar Cross Section and at the time of the incident was flying away from the radar head at an oblique angle. Investigation into the transponder showed that the aerial is shaped like a 'lollypop' and is positioned under the ac just aft of the engine firewall. The strength of the SR22's responses was significantly lower than comparable ac at similar ranges and bearings. The signal strength varied as the ac manoeuvred and this was most likely caused by shielding of the antenna by ac structures.

UKAB Note (2): The SR22 operator was contacted by the UKAB Secretariat and made aware of the NATS findings about low signal strength. The operator informed the maintenance organisation and requested that the transponder be re-tested, the ac having only just been returned from an annual check – a response is still awaited. The SR22 manufacturer was contacted and made aware of the NATS findings and EASA was also contacted through the CAA Aircraft Certification Division and were asked to pursue the issue with the FAA.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, transcripts of the relevant RT frequencies, radar video recordings and downlinked Mode S data from the LR45, reports from the air traffic controllers involved and ANSP, together with a report from the appropriate ATC authority.

The Board initially reviewed the piloting aspects of this Airprox. The LR45 crew had been given a departure clearance that kept the flight below CAS - 2400ft London QNH - before commencing a climb to 5000ft under a RCS with Thames Radar. The LR45 flight had then been transferred to the

TC Biggin SC, who on initial contact, realised that the flight was in confliction with the SR22 at 4000ft. Therefore, the Biggin SC immediately issued an avoiding action R turn and descent to 3000ft. Indeed during the LR45 crew's initial RT 'check-in' call a "traffic, traffic" TA was heard being annunciated by the ac's TCAS equipment in the background. The LR45 crew had endeavoured to follow the Biggin SC's instruction and had lowered the LR45's nose to reverse the 2500fpm ROC into a descent. During this manoeuvre the LR45 crew were reading back the ATC 'avoiding action' instruction, after which the SC passed TI on the SR22 to the crew, who then reported visual with it moments later. The LR45 Capt had reported that this sequence of events had occurred in a very short period, but he believed TCAS had annunciated an 'adjust vertical speed' RA which had then strengthened, as TCAS had then commanded an increased ROD to avoid the SR22. From the InCAS assessment, combined with the data received from the LR45's Mode S, it was revealed that TCAS had generated, initially, a 'maintain vertical speed, crossing maintain' RA which was not included within the LR45 Capt's report. Pilot Members thought that perhaps, during this fast-paced, rapidly changing, high workload situation, this RA was not fully assimilated by the crew before the descend' RA reversal was annunciated to them, probably as a result of the crew reversing their climb into a descent profile, in accordance with the ATC descent instruction. Moreover, continuous RT exchanges were taking place in addition to the LR45's onboard systems that would have generated warnings following the disconnection of the A/P by the Capt – generally known as the 'cavalry charge' – which is designed to capture pilots' attention immediately. That said, although the cockpit noise level was presumed to be very high, the TCAS display should have indicated to the Capt the appropriate sense of the RA to be adhered to - either a climb or descend – by appropriate red/green sectors on the VSI that needed to be followed. Pilot Members empathised with the LR45 crew's predicament, but it was clear that the LR45 Capt's recollection of the enunciated RA was somewhat at odds with the downlinked Mode S data as it coincided with the RT exchanges with ATC, whilst he was manoeuvring his ac and also looking for and acquiring the SR22.

[UKAB Post Meeting Note: This anomaly between the LR45 crew's first reported TCAS RA warning and the actual warnings generated could not be resolved at the meeting. Therefore the Chairman telephoned the LR45 Capt post meeting to discuss the TCAS event in more detail. In amplification of his written report, the LR45 Capt remembers hearing an RA aural warning probably the 'maintain vertical speed, crossing maintain' RA - as he was manoeuvring his ac to comply with the Biggin SC'S avoiding action turn and descent instruction. At this point he was concentrating on pitching the ac down and believed the RA he heard was reinforcing the ATC instruction to descend. He opined that the RA phraseology given was not entirely self-explanatory and somewhat misleading, as it did not give an aural prompt as to whether a climb or descent was required so, as he was reversing his original climb into a descent, he believed that he was conforming to the actions that TCAS was demanding. In the LR45 the VSI display is positioned in the bottom RH corner of the 'glass cockpit' display, and to a degree is masked by the control column, so he was not able to recollect exactly what indications he had on the VSI display at the precise time these events were unfolding. Discussion also broached the subject of audio queuing of cockpit warnings and the manufacturers set priorities when events are annunciated in an order through the audio system. This could potentially lead to a small delay of warnings being annunciated aurally when a higher priority alert might take precedence (the A/P disconnect for example). The LR45 Capt reiterated that at the time he was reversing his flightpath a TA alert was being received and he was speedily reacting to the ATC descent instruction and not the initial TCAS RA aural alert, as he perceived this RA was agreeing with his manoeuvre. Subsequently the RA guidance to 'descend' then 'increase descent' was assimilated just as he gained visual contact with the SR22.]

Noteworthy was the fact that the LR45 crew did not report any RA manoeuvre on RT to the Biggin SC. Normally with a passive RA, communication on the RT is not required if the pilot is able to satisfy the RA guidance and maintain the appropriate ATC clearance. In this case, the LR45 crew believed that the first RA was in accordance with the ATC descent instruction. However, had the 'maintain vertical speed, crossing maintain' RA been correctly assimilated and actioned, it should have been reported on RT as a 'TCAS Climb' or 'Unable to comply, TCAS RA' when the Biggin SC issued the avoiding action descent instruction.

In answer to a question from the Board, the NATS Advisor explained that STCA operates from a multi-radar tracking system which is why the alert was given even though only one ac was showing on SSR on the controller's single source radar picture. Although STCA displayed both c/ss in a 'conflict box', this would have been at the periphery of the controller's display and not in his direct point of attention. As part of the radar development programme it is planned to have multi-radar displays for Thames use in 2010.

Moving on to the controlling aspects, ATCO Members acknowledged the ATSI investigation findings but also had some sympathy with the Thames Radar controller's situation. Provision of a RCS to inbound and outbound ac from both London/City and Biggin Hill - with only a limited vertical depth of airspace to use - did increase the complexity of the controller's task on this, at times, busy sector. Here the SR22 had been placed on a radar heading and then 2·5min later the SSR label had disappeared on the displayed Stansted radar for over 4min and did not show again until after the Airprox, with only the ac's primary return showing intermittently thereafter. Members agreed that this had been a significant length of time for the SR22 not to be displayed to the Thames Radar controller and the ac's progress should have been monitored during the period. Although the controller was perhaps being over reliant on the displayed SSR labels to execute his plan, the SR22's 'presence' should have been evident from the ac's fps in the fps display. Also, a further check of the fps display when the LR45 flight was given climb clearance to 5000ft should have revealed the SR22's fps as known traffic in potential confliction. However, it was clear to the Members that the Thames Radar controller had climbed the LR45 flight into conflict with the SR22 whose SSR label was no longer displayed on the radar in use (Stansted 10cm), which had caused the Airprox.

Turning to risk, the TC Biggin SC had reacted as quickly as possible to the rapidly deteriorating situation and given the LR45 crew an immediate avoiding action R turn and descent instruction. The LR45 crew had received a TA alert during their initial contact RT call and attempted to reverse the ac's climb into a descent to follow the ATC instruction. The TI subsequently given allowed the LR45 crew to catch a glimpse of the SR22 above them and to their L but the crew was unable to assess separation distances. The Thames Radar controller saw the STCA alert but was unable to assimilate the situation from his display (only the LR45 label was flashing red) until he changed radar heads, which then revealed the SR22's SSR response, however, by then the Airprox had occurred and it was too late to pass TI to its pilot. Fortunately, the SR22 pilot had detected the approaching LR45 on TCAS to his R, below but climbing, and had monitored its flightpath. The SR22's TCAS 1 generated a TA alert when vertical separation was shown at -200ft and it was then that he broke out of cloud and saw the LR45 to his R. Quickly assessing that collision was not imminent, he watched the LR45 cross from R to L in front of his ac and diverge to his L with lateral separation of about 0·4nm at the CPA. Although the LR45 crew had complied with ATC instructions, they had not assimilated the initial TCAS corrective 'maintain vertical speed, crossing maintain' RA which had led to the TCAS reversal. Members agreed that this had reduced the actual vertical separation distances at the CPA but the lateral separation distances were not duly affected, resulting in the LR45 crossing 0·6nm in front of the SR22 before diverging SE bound. The Board concurred with the SR22 pilot's assessment; his good situational awareness and then visual sighting had removed any actual risk of collision but the subject ac had passed in such close proximity in Class A airspace with the LR45 just commencing its descent – albeit lagging behind the TCAS guidance this left the Board in no doubt that safety had been compromised during this encounter.

The NATS Advisor informed Members that 14 internal recommendations were formulated and actioned post incident. NATS had recognised before this incident that the Thames Radar task was becoming increasingly complex and that changes to the procedures were required. These changes will be a part of the larger TC NE Airspace plan that is currently under development. As a result of the incident, however, some short-term solutions have been implemented including changes to procedures to provide greater track separation between inbound and outbound ac in the sector. Free-flow procedures have been introduced to reduce telephone coordination between Thames and London City Tower and changes to the strip layout have been tested. A new interim fps layout is currently being used pending further procedure changes in April, when Thames will have another level to use. Biggin Hill traffic is now highlighted on the fpss as are composite ac. Even with the previous limitations of the Thames fps display, the SR22 would still have been evident if the fpss had

been used, so the NATS Human Factors team is working to ensure the correct use of the fps display in the future. The Thames operation, at low levels over a wide area, makes it difficult for one radar to provide adequate coverage at all times. Thames controllers are trained in the limitations of each available radar source and can make their selection according to many variables including atmospheric conditions. An operating position handover mnemonic contains a reminder to pass on radar data, including any observed deficiencies in performance and the radar in use and this was not followed in this incident. A notice was issued to remind controllers about the limitations of radar, particularly primary performance, and this will be followed by other reminders about SSR capabilities.

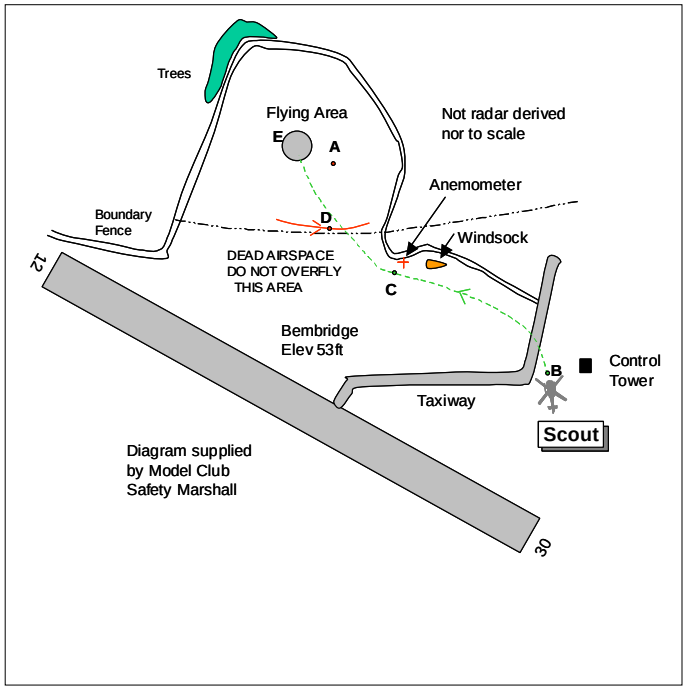
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The LTCC Thames Radar Controller climbed the LR45 into conflict with the SR22, whose SSR label was no longer displayed on the radar in use (Stansted 10cm).

Degree of Risk: B.

AIRPROX REPORT No 083/07

Date/Time:	7 Jun 1745-1800	
Position:	5041N 00107W (O/H Bembridge A/D - elev 53ft)	
Airspace:	FIR	(*Class:* G)
	Reporting Ac	*Reported Ac*
Type:	Scout	Model Ac
Operator:	Civ Pte	Civ Club
Alt/FL:	10ft (agl)	(agl)
Weather Visibility:	VMC CLNC 6km	VMC
Reported Separation:	50m H	NR
Recorded Separation:	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE SCOUT PILOT reports that his helicopter was parked immediately in front of the Control Tower. After starting up he made an open broadcast on 123·25MHz of his intentions and hover taxied towards RW30, converging towards the mid-point of the RW on a W'ly heading. He maintained a height of about 10ft and allowed the speed to build to 20kt, intending to accelerate to climbing speed on RW heading at the point of interception. He suddenly became aware of a yellow model ac at a similar height crossing from L to R in front of him. It appeared to be about to clear his flightpath to the R when it turned R onto an E'ly heading and was now heading straight towards him, exacerbating the risk of collision. As it continued to turn R it began to cross his flightpath R to L so he broke hard R onto a N'ly heading, the model passing about 50m away, and he landed near the designated Model Flying Area so that the matter could be discussed. The model was operating at least 250yd S of the authorised model operating area.

THE MODEL AC OPERATOR reports carrying out normal safety checks as per club rules and preparing his yellow lightweight model ac for flight. The most senior member of the club not flying was acting Safety Officer. After receiving agreement from other members flying he executed a take-off, the wind was NNE'ly 6kt or less. He flew a series of ccts to the NE of the flying site until at 1855A the Safety Officer reported a light ac approaching from the N. He positioned his model ac to the S of the flying circle and commenced ccts up to the edge of the area of published 'dead air space'. Almost immediately the Safety Officer reported a helicopter (the subject Scout) starting up. Bearing in mind 2 days previously the same helicopter took off and followed a track along the main RW, he decided to complete the cct that he was on and then land. At the end of the downwind leg and when turning to port for a landing, the helicopter turned sharply around the windsock and radio mast and almost forced him to crash his model. He continued his approach (extremely shaken) and managed to land his model approximately 4m short of the flying circle. By the time he had walked to his model (about 10m) a man approached him from the helicopter which had landed adjacent to the flying circle and public footpath. The man asked for his name and told him that he was filing a 'near miss' before returning to his helicopter (engine and rotor running) and departing. By now he was extremely shocked and speechless. At no time during the flight did he exceed the parameters laid down in the Club rules.

THE MODEL FLYING CLUB SAFETY OFFICER reports being positioned in the model pits area at point A and saw a helicopter at point B power-up so he passed this information to 3 model pilots who

were flying. The helicopter lifted to a low height and started to follow a NW'ly path indicated by line B-C (see diagram). Simultaneously another observer warned the model flyers of a light ac passing to the N of the area. He continued to observe the helicopter, being somewhat puzzled by its routeing as it flew very close to the S of the radio mast at approximately half-mast height. As it reached position C a model flew a curved W to E path at the same height but then at point D the model flyer took evasive action by diving his ac below the helicopter height and continuing on the same path, passing to the N of the mast. He estimated separation as 50m. At least 1 other model was still airborne as the helicopter landed at point E and then the occupant of the front LH seat exited the helicopter, rotors running, to remonstrate with the model pilot.

UKAB Note (1): The UK AIP at AD 2-EGHJ-1-2 promulgates Bembridge ATZ as a circle radius 2nm centred on mid-point of the longest notified RW (12/30) 504041N 0010634W except that part of the circle SW of a line joining 504100N 0010939W and 503851N 0010748W active Summer 0730-1700Z. Section AD 2.20 Local Traffic Regulations –Warnings states at para (e) *"Tug launched glider flying takes place outside published operational hours"*.

UKAB Note (2): The Model Flying Club rules states that when flying at Bembridge all members must abide with the Club Rules and safety rules which include:- 1) No overflying hangars or parked aircraft (see 'Dead' Airspace on map), 2) No flying above 500ft, additional height restrictions apply to models weighing more than 7kg, 3) There will be a minimum of two adult club members at any flying meeting. Approved flying times for flying are:- Saturday and Sunday mornings (9:00am to 1:00pm); Tuesday, Thursday and Friday evenings 6:00pm until sunset. The members will fly their models from a mown grass area situated on the north side of the airfield at a distance of approximately 300m from the northern edge of the main runway. At all times on the airfield there should be at least one adult club member keeping a lookout for any potential hazards (low flying full size aircraft, walkers etc) and if necessary warn those still flying. The Safety Code for General Flying quotes Articles 73 and 74 from the ANO:-
Art 73) *"A person shall not recklessly or negligently act in a manner likely to endanger an aircraft, or any person therein".* Art74) *A person shall not recklessly or negligently cause or permit an aircraft to endanger any person or property"*.

UKAB Note (3): The Bembridge Aerodrome Manual extant at the time of the incident at SOP6.7 Safe Integration of Aerodrome Activities states:-
Bembridge Airport operations integrate many diverse activities on a daily, occasional or rare basis, such as:- iii) ...*The model-flying club operate model aircraft on a prepared strip at the northern corner of the aerodrome (crash map reference J6). This normally takes place on weekday evenings (during the dry season) and weekend mornings (predominantly Sundays). However the club retain the right to carry on their activities at any day or time so long as they comply with air traffic advice and safety management. In pursuance of that statement the Club shall provide a pair of two-way hand-held PMR radios in order that communications with the control tower is established before model flying begins and is maintained throughout* [during airport operational hours]*. All other Model Flying Club procedures shall be as stated in 'Model Flying Operational Procedures dated 22/04/04, a copy of which is attached as Appendix A to this SOP.*

UKAB Note (4): Following this incident the Aerodrome Manual was revised after discussion between the Model Flying Club, the Aerodrome Licence Holder and the Aerodrome Operator responsible for operations during normal hours. Section SOP6.7 was rewritten and para 6.7iii.5 Model Flight Operational Procedures includes the following.
vii) *The first B certificate holder to arrive at the operational area shall be the Safety Marshall until relieved by another member meeting the criteria for this role*.
viii) *Outside airport operational hours the Safety Marshall must oversee not only the safety and application of procedures, but also consider the movements of full size aircraft, as there will be no duty air ground operator present to make these considerations*.
xiv) *In respect of the above statement club members shall endeavour to deconflict with full size aircraft.*
xv) *In support of the above considerations, the Club shall provide and have available at all times outside airport operational hours, a hand-held receiver for which the Safety Marshall can maintain a*

listening watch on the Bembridge Radio frequency 123·25MHz. As OFCOM license holders for this frequency, the Airport Operator shall impart a devolved responsibility to the Club to receive this frequency for the objective of maintaining safety.

UKAB Note (5): In addition to the revised section SOP6.7 in the Bembridge Aerodrome Manual, an Appendix to section SOP6.21 details the procedures to be followed by pilots operating outside normal hours. This part is on permanent display in the aerodrome terminal building and pilots wishing to operate out of hours are referred to the laminated copy and/or handed a paper copy for reference which states: -

1. Transmit all calls that you would normally send to the Air/Ground Operator, prefixed with the phrase 'Bembridge Traffic'.
2. Observe circuit height and patterns as applicable during operational hours.
3. Only use the hard runway.
4. Do not under any circumstances use grass runway 23
5. Movement between the parking areas and runway shall only be via the dedicated taxiways as applicable to the preferred runway orientation.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilot and operator of both ac and reports from the appropriate aerodrome operating authorities.

The Chairman reminded Members that equal weight should be given to the Scout pilot's account and the Model Ac Operator's viewpoint when, as in this case, disparate descriptions of the event were reported. The Scout pilot had reported hover-taxying in a W'ly direction towards the RW at 10ft when a model ac flew towards his helicopter, in his opinion well outside the Model Flyer's normal operating area, which had caused him to take evasive action. Conversely, the Model Ac Operator had reported flying just inside the Southern edge of the published area when the helicopter hover-taxied towards the Model Flying area and into confliction. Even with promulgated segregated areas, Members opined that with such diverse operations, due regard should be taken by all the operators involved to ensure that adequate safety margins are maintained at all times. Members commended the actions taken by the Aerodrome Operator and Aerodrome Licensee post incident to address this issue in the Aerodrome Manual but agreed that the 'notifying' document (the AIP) should also be amended to include model flying activity and its integration with other aerodrome operations for the benefit of pilots unfamiliar with local procedures at Bembridge. In this vein, the Board charged the Director with writing to the Aerodrome Licensee to invite him to review the AIP entry.

Although both parties agreed that the minimum separation distance was about 50m, only those who were there at the time know exactly what had occurred. Without any further corroborating information available, with such disparate viewpoints about the incident reported by the individuals involved, the Board could not resolve this apparent anomaly and could only conclude that this had been a conflict over Bembridge aerodrome, which was resolved by both the Scout pilot and the Model Ac operator. Furthermore, in the Board's view, their combined actions had quickly and effectively removed any risk of collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict over Bembridge aerodrome resolved by the Scout pilot and the Model Ac operator.

Degree of Risk: C.

AIRPROX REPORT No 099/07

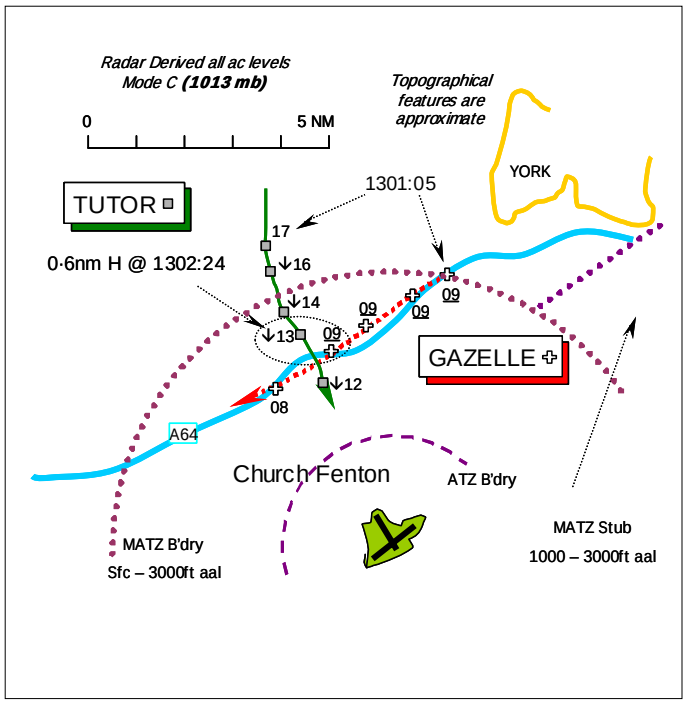
Date/Time: 13 Jul 1302

Position: 5354N 00114W (3½nm FINALS RW16 Church Fenton - elev 29ft)

Airspace: MATZ (*Class:* G)

Reporter: Church Fenton TALKDOWN

	First Ac	*Second Ac*
Type:	Grob Tutor	Gazelle
Operator:	HQ AIR (Trg)	Civ Pte
Alt/FL:	1100ft↓ QFE (1009mb)	NR
Weather	IMC In cloud	NR NR
Visibility:	NR	NR
Reported Separation:	350ft V/¼nm H	NR
Recorded Separation:	400ft V/0·3nm Min H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE CHURCH FENTON ATCO I/C reports that he was also manning TALKDOWN 2 towards the end of a busy recovery period in poor weather conditions. The latest actual weather promulgated was colour code GREEN conditions – 3/8th SCT cloud at 700ft agl; visibility: 3700m. The Tutor ac was on an IFR approach to RW16 at Church Fenton and its pilot had requested and received a RAS, which in accordance with SOPs, was downgraded to a RIS once inside the Final Approach Fix at 5nm from touchdown.

After completing a PAR for another ac the APPROACH controller drew his attention to previously called unknown traffic displayed in confliction with TALKDOWN (TD) 1's traffic – in the subject Tutor's L 10 o'clock at 1nm. Due to the narrow radar beam so close to touchdown the conflicting ac was not showing on the PAR display. He then selected TD 1's frequency and landlines to listen in. A few seconds later the conflicting ac appeared on the PAR screen heading E-W on a course to cross the RW16 centreline and glide path at approx 3nm from touchdown. The TD controller again called the traffic to the Tutor pilot, at which time he – the ATCO i/c - instructed TD to stop the Tutor's descent, which was acknowledged. The Tutor pilot maintained 1100ft QFE until clear of the confliction. At 1302:32, inside 4nm from touchdown, the Grob Tutor came within ¼nm and 350ft vertically of the then unknown ac – the Gazelle. The Gazelle's estimated height was 650ft - these figures were derived from the PAR playback function. The approach was then continued without further incident.

He stressed that there are no surveillance radar displays in the Church Fenton ACR and the APPROACH/DIRECTOR task is conducted from Linton-on-Ouse. Ac are then handed over via landline once visible on the PAR screen. Therefore, the PAR controller at Church Fenton is often not aware of the 'bigger picture' outwith his PAR display.

In hindsight, and certainly after reviewing the playback, he should have insisted on breaking-off and climbing the Grob Tutor in order to achieve as much separation as possible.

The pilot of the other ac - the Gazelle helicopter - did not contact Church Fenton on any frequency.

The Church Fenton 1250UTC weather was: Visibility: 12km in Moderate rain; Cloud: 3/8 – 900ft 5/8 - 1400ft, 8/8 – 2000ft. The pilot reported the cloudbase to be 900-1000ft at the Airprox location.

THE GROB TUTOR PILOT reports he was conducting an instrument approach under IFR for aircrew currency training at Church Fenton and was in receipt of a RIS from TALKDOWN, inside the FAF, heading 155° (M) at 100kt. He did not see the other ac as he was descending through 1100ft QFE (1009mb), in cloud, at the time. Flying in IMC, they were occasionally visual with the ground as the base was variable and they were approaching the reported cloudbase at the time. Had the controller not instructed him to maintain height, he would have initiated a MAP.

The ac has a white colour-scheme and the ac's landing lights, navigation lights and HISLs were all on.

THE GAZELLE PILOT declined to provide a report.

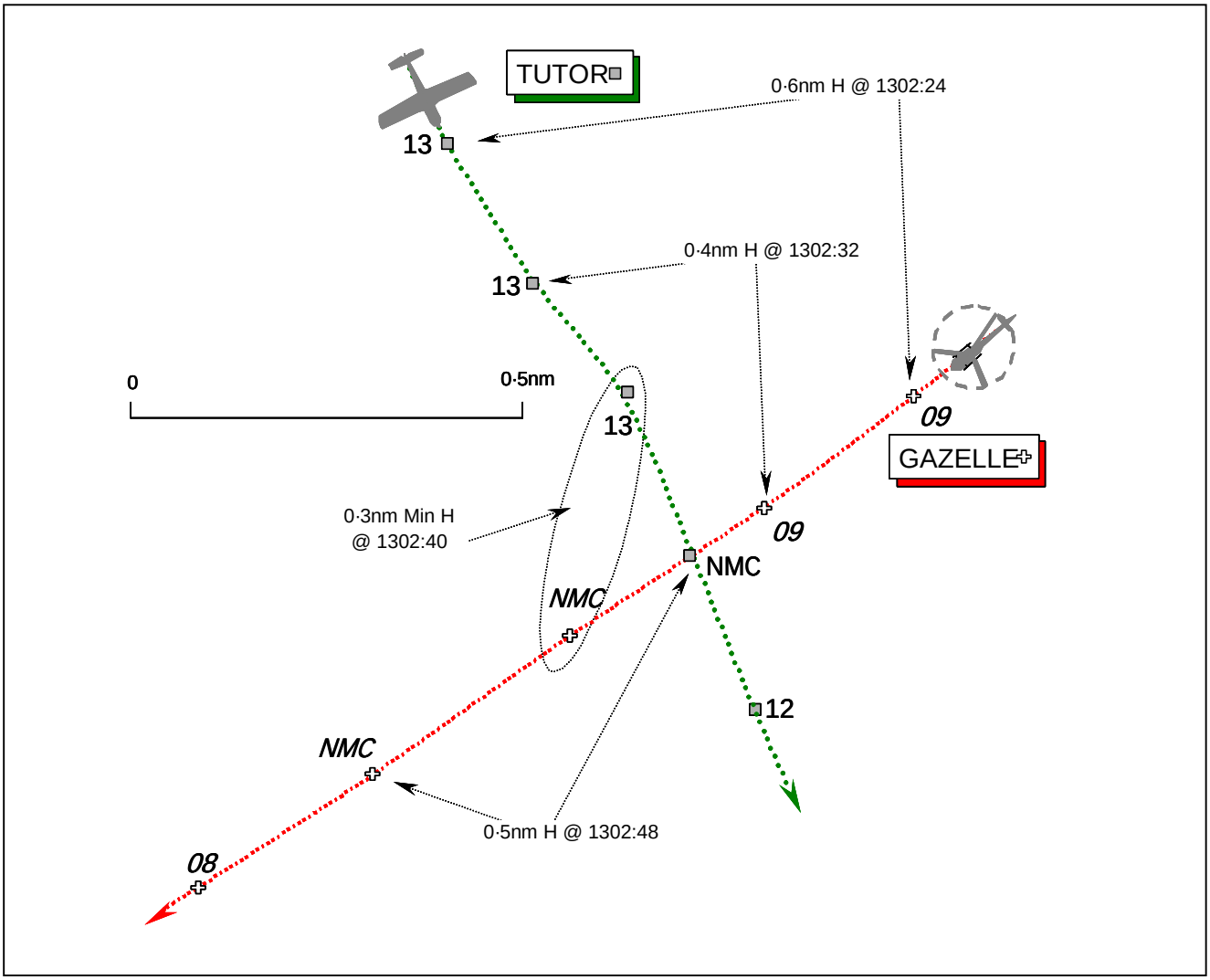
MIL ACC reports that the Grob Tutor pilot was conducting a PAR recovery in 'Azimuth only' to RW16 at Church Fenton. (Mil ACC Note: During an 'Azimuth only' approach, TALKDOWN gives instructions to the pilot to keep the ac on the centre-line, but advises pre-calculated heights at 1nm and ½nm intervals. It is the pilots' responsibility to 'meet' the heights read out at each range. Because it was a 'training' approach, TALKDOWN would still have the glide-path picture displayed and thus would have been able to see the Gazelle's contact on the elevation display.) The cloud base was 900ft in moderate rain and it was the 15th talkdown of the day. Two talkdown consoles were in use just before the incident. One was being manned by the ATCO i/c – TALKDOWN 2 and the other by the nominated talkdown controller - TALKDOWN 1 (TD). Talkdown is located within the Control Tower at Church Fenton airfield, along with the ADC and the ATCO i/c. However, the Approach Controller (APP) sits 13nm away in the ACR at Linton-on-Ouse. ATC in the Church Fenton Tower does not have a search radar display.

The Tutor was already established on PAR and in receipt of instructions from TD when, at 1300:48, TD was informed by APP, via landline, that the Tutor had *"..traffic left 10 o'clock, 3 miles, crossing left right, indicating 7 hundred feet below".* TD acknowledged the information and relayed it word-for-word to the Tutor pilot, now at 4½nm from touchdown. The Tutor pilot also acknowledged the traffic information. TD then gave the Tutor pilot several instructions relating to the ac's position relative to the centreline, as well as height read-outs. At 1301:59, TD transmitted to the Tutor pilot "*4 miles, 1 thousand 2 hundred feet'*. During this call, APP informed the ATCO i/c that the previously reported traffic was *"left, 10 o'clock, 1 mile"*. Just after this, at 1302:01, TD joined in on the landline and APP repeated *"crossing 1 mile"*. The Gazelle helicopter appeared on the narrow beam PAR display immediately after this call and TD and the ATCO i/c both saw it. At 1302:06, TD advised the Tutor pilot "..*traffic left, 10 o'clock, 1 mile, crossing left right indicating slightly below*'. TD still had the presence of mind to continue to pass centre-line information. However, having quickly assessed the situation, the ATCO i/c instructed TD to *'Stop descent mate'*. At 1302:20, TD transmitted *"..stop descent"*. The Tutor pilot responded at 1302:23, saying *"..stopping descent 1000 feet"*. TD quickly followed up with "Tutor [C/S] *that traffic now in your left 11 o'clock half a mile crossing left right slightly below*'. Whereupon the Tutor pilot responded "..*india mike charlie"*. TD re-iterated at 1302:33, *"Roger, maintain height"*, which was acknowledged before at 1302:42, TD informed the Tutor pilot that the "..*traffic has now passed, continue descent"*.

This Command considers that TD, the ATCO i/c and APP worked very well as a team and took positive action to avoid this incident potentially becoming a mid-air collision. Without the benefit of a report from the Gazelle pilot, it is impossible to say what his in-flight conditions were. It is possible that the Gazelle pilot was flying just below the cloud base, which has been accurately reported as 900ft. The Tutor pilot reported that he was still IMC at 1100ft. Had the Tutor continued its descent, it would have reached 1050ft by 3½nm from touchdown, exacerbating the situation and giving the pilot very little time to see and avoid the Gazelle if he had 'popped-out' below cloud. The Gazelle pilot would, similarly, also have had very little chance of seeing and avoiding the Tutor. With APP acting as their eyes, TD and the ATCO i/c were aware of the threat. As soon as the Gazelle appeared on

the PAR screen, the ATCO i/c, who was not directly involved with giving the Tutor control instructions, was able to quickly assess the situation and make the necessary decision to stop the Tutor's descent.

There appears to be no indication that the Gazelle pilot was lost or in difficulty. Whilst the Gazelle pilot is under no obligation to remain outside a Military Aerodrome Traffic Zone (MATZ), this Command considers that an information call to Church Fenton APP would have greatly increased his SA and safety.



UKAB Note (1): The Claxby radar recording shows the Grob Tutor inbound to Church Fenton FINALs for RW16 at 1302:24, indicating 1300ft (1013mb) – broadly 1180ft QFE (1009mb), with the Gazelle maintaining a steady SW'ly course indicating 900ft (1013mb) – about 780ft QFE (1009mb). The Gazelle appears to be broadly following the track of the A64 road and a course perpendicular to the FAT for RW16. Just before the Gazelle crosses ahead of the Grob Tutor in between radar sweeps the helicopter is shown at a minimum of 400ft unverified Mode C beneath the Grob Tutor maintaining 1300ft Mode C in conformity with the instructions issued by TD. Minimum horizontal separation occurs on the next sweep at 1302:40, when the Gazelle is shown at a range of 0·3nm as the Grob starts to draw astern of the helicopter; NMC is shown thereafter by both ac.

UKAB Note (2): The UK AIP at ENR 2-2-2-1 notifies the Church Fenton ATZ as a radius of 2nm centred on RW06/24, extending from the surface to 2000ft above the aerodrome elevation of 29ft amsl and active during the period of this Airprox.

HQ AIR (TRG) comments that it is disappointing that the Gazelle pilot declined to provide a report to help the investigation. Consequently, the investigation lacks the balance of information that comes

when all those involved contribute and we do not know why the Gazelle pilot did not make an information call to Church Fenton. The ATC team reacted positively to this incident and reduced the risk of an actual mid-air collision.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included solely a report from the Grob Tutor pilot, transcripts of the relevant RT frequencies, radar video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

It was most unfortunate that the Gazelle pilot had declined to provide an account of his flight during the period of this Airprox. Clearly lacking the benefit of his report, the Board's assessment was, therefore, not balanced and did not provide as incisive an insight into events as might have been the case if he had followed established reporting guidelines. A commercial helicopter pilot Member was concerned that the Gazelle pilot might not be apprised of the outcome of this assessment, however, he was reassured to learn that, despite the Gazelle pilot's unwillingness to contribute, a copy of the final report will be sent to him. In the pilot Member's view, it was irresponsible of the Gazelle pilot not to provide an input to this flight safety investigation, which the Board agreed was indicative of a poor attitude to flight safety as a whole.

Clearly both pilots were legitimately proceeding about their respective tasks. However, the Grob Tutor pilot operating under IFR in cloud, executing an established instrument approach procedure (IAP), would have been entirely unaware of the presence of the Gazelle helicopter as it transited below the glide path in the vicinity of the final approach to RW16, until he was advised by TD following the prompt warning from APP. It was clear that despite the approach being executed 'in azimuth only' [a precision runway approach] the elevation PAR data was still displayed to TD who could thus see the position of the unknown ac – the Gazelle – relative to the Grob when it flew into the very narrow beam of the RPAR equipment. The comprehensive Mil ACC report made it plain that following the warning from APP, the ATCO i/c had instructed TD to stop the Grob's descent to avoid the Gazelle, which was a wise decision. The Board agreed that had he not done so, the Grob pilot would have been poorly placed to avoid the helicopter – assuming it was flying below the cloud base. The Mil ACC advisor emphasised that the TD controller was only obliged to call traffic information to the Grob pilot under the RIS that pertained. TD – prompted by the ATCO i/c - had in fact gone that extra step in providing a collision avoidance 'stop descent' instruction as the Grob descended towards the helicopter – a mandatory instruction for military pilots within a MATZ. This then led to a wide ranging debate about the efficacy of providing a RIS to pilots operating IFR in cloud who are unable to fulfil their responsibilities to 'see and avoid' other traffic in Class G airspace. To many it is difficult to rationalize the provision of a RIS – essentially a VFR radar service where pilots must sight the reported traffic and effect their own separation – whilst providing positive instructions to IFR traffic on recovery flying IMC in cloud. The Member from C-in-C Fleet commented that Naval ATSUs will more commonly afford a RAS to instrument traffic on a PAR recovery, where it is accepted that the responsibility to afford standard separation on unknown traffic is limited to that of collision avoidance, as the narrow beam of the PAR does not afford sufficient radar coverage to detect conflictors, whilst conducting the talkdown. The DASC advisor added sagely that this surveillance function is still within the purview of APP or DIRECTOR who, utilizing their SRE, can keep TD advised of any conflictions that might arise during the conduct of the approach – as occurred here. Thus for his part the Grob pilot merely followed the mandatory instructions issued to him by TD. It was interesting to note however, that if TD had not stopped the Grob pilot's descent, the latter reported he would have executed a MAP, which might well have afforded more separation against the unknown Gazelle.

Whilst it might be argued that the Gazelle pilot was unaware of the IAP to RW16, indeed the Church Fenton MATZ stub is aligned to RW24, it was clear that this conflict developed within the main part of the MATZ which extends out to a range of 5nm from the aerodrome from the surface to 3000ft aal and established for the increased protection of arriving, departing and circuit traffic. In the airspace outside the ATZ [outside a radius of 2nm here] observation of MATZ penetration procedures is not compulsory for civil pilots. However, the extant UK AIP entry at ENR 2-2-3-1 entreats civil pilots in

the interests of flight safety and good airmanship: "…*it is strongly recommended that all pilots not previously receiving an ATS obtain a MATZ penetration 'approval' from the MATZ operating authority, prior to entering a MATZ."* In the Board's view this advice is especially pertinent when passing beneath an instrument approach. The Gazelle pilot – presumably operating under VFR - was ultimately responsible for maintaining separation against other airspace users within the Class G MATZ. But he would have had little warning and might have been poorly placed to avoid the Grob – as was his responsibility under the 'Rules of the Air' in this crossing situation - had it descended out of the cloud in front of him. Whereas had the Gazelle pilot been in communication with Church Fenton on the frequency promulgated for the MATZ Penetration Service - 126·5MHz - then traffic information about the Grob might well have forewarned him of the potential for the conflict, which in a helicopter pilot Member's view was caused by the Gazelle pilot. A pilot Member opined that good airmanship would dictate that a call to ATC was far wiser than flying through the MATZ unannounced. Whilst this was a legitimately permitted, it is most unwise and it was fortunate that the conflict with the helicopter was detected by APP and the Grob pilot instructed to stop his descent by TD. This was the nub of the issue and the Board agreed that this Airprox was the result of a conflict in the vicinity of the final approach to RW16 at Church Fenton, resolved by ATC.

The Board commended the ATCO i/c, TD and APP for their good teamwork here in resolving this conflict, for it is clear that their prompt action had forestalled a close quarters situation and preserved what vertical separation there was in the final stages of the encounter. In the Board's view, despite the minimum indicated vertical separation of 400ft from Mode C as the Gazelle crossed ahead of the Grob Tutor, the combined actions of these three controllers coupled with the prompt reaction by the Grob Tutor pilot to TD's instructions, had effectively removed any risk of a collision between the subject ac.

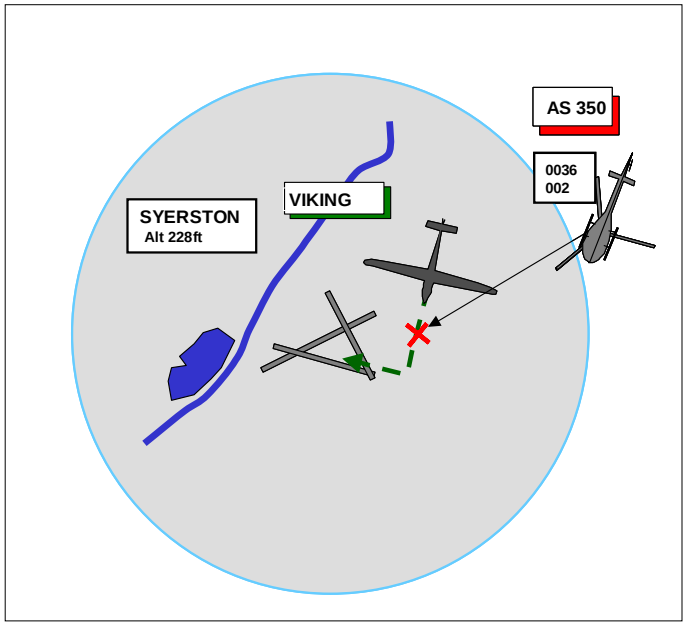
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the vicinity of the final approach to RW16 at Church Fenton, resolved by ATC.

Degree of Risk: C.

AIRPROX REPORT No 108/07

Date/Time:	2 Aug 1443	
Position:	5301N 00055W (¼nm APP RW30 RAF Syerston - elev 228 ft)	
Airspace:	Syerston ATZ	(*Class:* G)
	Reporting Ac	*Reported Ac*
Type:	Viking T1 Glider	AS350
Operator:	HQ AIR (Trg)	Civ Trg
Alt/FL:	350ft (QFE NR)	50-100ft AGL (N/K)
Weather Visibility:	VMC NR >10km	VMC CLBC >10km
Reported Separation:	300ft V/0 H	NR
Recorded Separation:	NR	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE VIKING T1 GLIDER PILOT reports flying an instructor training flight from Syerston. While on the base leg for RW30 he saw a helicopter hovering at tree height about ¼nm out on the final approach. The Duty Instructor was talking to the helicopter and made repeated requests for him to vacate the area immediately, however it continued to manoeuvre directly in his path. He was at 350ft AGL and maintained this height until he was clear of the helicopter and delayed opening the airbrakes to ensure maximum vertical separation, which caused him to land long. Due to his manoeuvre he assessed the risk of collision as being low.

THE AS350 PILOT reports that while carrying out low-level power line patrols in the Newark area, he contacted Syerston Radio as he had a line to patrol that ran up to the airfield boundary from the NE. He passed his details and a brief description of his intentions which included his height on patrol as being generally 50ft agl but up to 200ft and his route as working along a power line towards the airfield from the NE right up to the airfield boundary. He requested airfield information and any traffic and a response came from someone who used an undecipherable call sign. He was passed the RW in use, the QFE, the fact they were cable-launching gliders to the W, that a motor glider had left the circuit to the W and that apart from that ac Syerston had *"no reported traffic in the circuit".*

His workload was high but he continued to monitor the frequency as he worked his way very slowly to the ATZ boundary where he made another call, again stating his position and intentions in full but this was acknowledged only by a single click of the transmit button by Syerston Radio. At 1nm to the NE of the field he made yet another call stating his position level and intentions and continued his patrol inbound. At about ½ mile from the airfield he received an anonymous call stating, *"there is a glider behind you!"* which he acknowledged and looked but as it was behind him he was unable to see it. He was still at his patrol height of 50–100ft agl and flying at around 20kts and he continued a little further into an open area where he stopped and made a lookout turn and saw a glider passing over the threshold of RW25 [he thought]. He was S of the centre line and very low and at that point not in conflict to the glider. He cannot comment on how close the glider came to him, as he was unable to see it as it was behind him. He assessed the risk as being low.

He was then told by someone who would not identify himself on the Syerston Radio frequency that he was in an active ATZ without permission and he should have called the Tower (he had done so several times in the last 15min).

He is aware of the regulations in the ANO which state that an A/G operator cannot offer a clearance over the radio and therefore cannot refuse entry to an ATZ but had they told him that they were very busy (which they did not – quite the opposite) and that it was not suitable for him to conduct the inspection then he would not have inspected that part of the line or would have returned at more convenient time.

After being asked to leave the ATZ he did so and returned to Wickenby. He made several attempts to make contact with Syerston by telephone but got no answer so he left a message on their answer-phone.

In his opinion there were several things that lead to this situation, namely:

1) While talking to Syerston Radio after the first call he received no further information from them regarding inbound traffic; the last information passed was that the circuit was clear which was no longer accurate. Further he had made regular calls to them giving his position and intention but received no responses.

2) The glider pilot made no VHF transmissions.

3) As he had heard no other ac on the radio and he had received no further information from Syerston Radio despite his numerous calls, he assumed the airfield was quiet with no traffic. (No call such as 'No RT traffic operating in the circuit' was made in response to his calls to Syerston Radio.

4) He believes that his presence, level and slow speed was a surprise to the glider pilot who would not have expected him to be there.

The pilot has carried out very many low level power line patrols right up to the boundary of every military airfield in UK and most civil airfields, with no problems whatsoever and in accordance with company operating procedures, if anything he makes more radio calls than actually required because of the very slow progress while on such patrols.

He assessed the risk as being low.

UKAB Note (1): Syerston is promulgated in the UKAIP ENR 2-2-2-4 as an ATZ circle 2nm centred on the longest notified RW up to 2000ft aal. It is active from 0830-sunset (1hr earlier in the Summer). It is a Government Aerodrome with an A/G service.

UKAB Note (2): Rules of the Air (RoA) Rule 12 requires that ac conform to the traffic pattern or keep clear of the airspace in which the pattern is formed …

UKAB Note (3): Rules of the Air Rule 45 in these circumstances requires that an ac commander shall obtain information from the A/G communication service to enable flight to be conducted safely within an ATZ.

UKAB Note (4): CAA (FOI (H)) confirmed that Powerline Inspection Operators do not have any exemptions to the ANO in respect to Rule 12 or Rule 45.

UKAB Note (5): The recording of the Claxby Radar shows the Helicopter operating in the area of Syerston at very low altitude both inside and outside the ATZ. At 1443 it was operating just under 2nm NE of the airfield datum at FL002 (almost ground level (QNH 1014, elev 228ft)). The helicopter comes closest to the airfield at 1446 when it is just inside 1nm from the datum and then departs to the E after an orbit. The glider does not show at any time.

HQ AIR (TRG) comments that this incident was clearly the result of some confusing RT. Syerston airfield is a busy 7-day per week glider site operating motor gliders on one circuit, winch launched conventional gliders on a mirror circuit and often, an aerotow operation using the space between. While there is an Air Ground radio operator on the airfield, from an operational standpoint, the radio is only used for management purposes, and of course to advise transiting/visiting ac of the airfield operation. Although all ac based at Syerston are fitted with VHF radio equipment, it is Standard Operating Procedure (SOP) for circuit traffic to operate without radio calls with the Duty Instructor (A/G operator) monitoring. With up to 6 gliders and 6 motor gliders operating simultaneously, and by the very nature of glider ops, it is not possible to keep track of the conventional glider circuit, hence the SOP. Therefore it would be difficult to advise visiting ac on the whereabouts of individual gliders within the ATZ. The glider pilot was certainly surprised to find a helicopter on his approach, but was able to modify that approach and land elsewhere on the airfield. This is standard practice for glider ops when other gliders have had to return due to poor thermal activity.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, a radar video recording and a report from the Viking operating authority.

Members considered in turn the part played by the 3 parties in this incident namely the 2 pilots and the A/G operator(s).

The Helicopter pilot was engaged on a high workload but familiar and routine operation that required him to approach right up to the airfield boundary and this was necessarily conducted at very slow speed and at a very low height. Clearly he was cognisant that his very slow speed was a significant factor when passing information to other agencies and he did his best to make this clear to the A/G operator and made several accurate information reports in the period of his inspection (over 10min from his first call). Due to an inaccurate traffic report in response to his initial call the helicopter pilot was under the mistaken impression that there *'was no reported circuit traffic'* which, although it might have been technically accurate at that precise moment the transmission was made, did not give him a true picture of what was occurring or about to take place at the airfield. This led him to believe that it was safe to proceed with his task and, since there was no circuit traffic at the time, integration (as required by Rule 12 of the RoA) was not an issue since, in effect there was no traffic pattern (or indeed mirror patterns for powered ac and gliders as reported by HQ Air) to conform to. A helicopter pilot Member very experienced in powerline and pipeline surveys suggested that good practise would have been to telephone Syerston in advance to warn them and discuss the task, but it was noted that when the helicopter pilot attempted to call the airfield subsequently there was only an answer phone and he was unable to discuss the incident or identify the person who was supervising operations at the time of the Airprox. In summary, the Board considered that the AS350 pilot had acted in a thoroughly professional manner.

When considering the role played by the A/G operator(s) here, Members noted that Syerston is a very busy airfield located in an area where there are also many GA training and transit ac. The Board considered that the 'information' provided by the A/G service had been a major factor in this incident and had not been up to the normally high standards encountered at military airfields. It seems that there were several personnel acting as the A/G operator during the short period that the AS350 was in contact with them. There appeared to be no continuity, corporate cognisance of the helicopter and no updated information regarding the aerodrome traffic passed to the AS355 pilot as the situation changed. The Board was briefed that the A/G operator function is normally carried out by the Duty Instructor but, while not specifically criticising this procedure, specialist Members stressed the importance of the role and that continuity is vital so that up-to-date knowledge of airfield operations is maintained and the remit of an A/G Operator, [as described in CAP452 for civilian operators] can be fulfilled. Without an R/T transcript, [the recording of an A/G Station's radio traffic is not obligatory] it was not possible to be certain, but it was the unanimous opinion of Members that poor R/T technique

had also been a factor. Members considered that airfields with an ATZ, whether civil or military, have an obligation to provide pilots with an appropriate level of service that enables the flight to be conducted safely within the Zone, either to transit safely through that ATZ or join the circuit. Furthermore, if the nature of aerodrome operations is so intense, then consideration should be given to the provision of an Air Traffic Controller rather than an A/G Operator. Appropriately qualified Controllers can provide an increased level of positive 'Control' over aerodrome movements whereby permission to enter the ATZ would be necessary, thereby providing a higher level of safety over locally based, visiting and transit ac.

Members were briefed by a specialist glider Member that in itself, so long as it is predictable, the presence of a helicopter below 50ft at the airfield boundary does not present a significant problem in normal wind conditions. For a variety of reasons glider pilots may have to land 'long' and in this case the glider pilot had sufficient warning and speed to do so in a fully professional manner without endangering either ac.

Noting that both pilots agreed that the risk had been low and had also agreed the basic geometry, it seemed to the Board that this incident had been reported as an Airprox to make a point about 'infringements' rather than any collision risk. Unanimously, the Members attributed a cause of 'Sighting Report'.

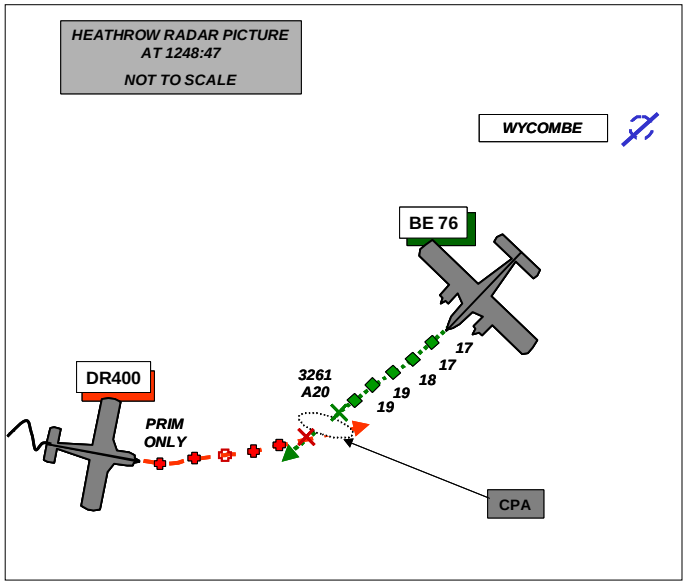
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting Report.

Degree of Risk: C.

AIRPROX REPORT No 109/07

Date/Time:	4 Aug 1249 (Saturday)	
Position:	5135N 00050W (2nm SW of Wycombe)	
Airspace:	Wycombe ATZ	(*Class:* G)
	Reporting Ac	*Reported Ac*
Type:	BE76	Robin DR400
Operator:	Civ Trg	Civ Club
Alt/FL:	↑1800ft (QNH 1020mb)	↓1500-1600ft (QFE NR)
Weather	VMC CAVOK	VMC NR
Visibility:	>10km	NR
Reported Separation:	100ft V/30m H	NR
Recorded Separation:	NR V/250m H (as it passes through the BE76's 12 o'clock)	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE BE76 PILOT reports that he was flying a blue and white ac with lights and strobe switched on, squawking as directed by London ACC, with Mode C on a training flight from Wycombe in good VMC. He was passing 1800ft alt, [see UKAB Note (2)] heading 240° at 100kt and following the noise abatement departure when a Robin appeared high in his windshield in a descending right banked turn, coming from above and to his right. It passed 2-300m in front of him continuing its descent. He assumed it was a locally based glider tug returning from an aerotow after dropping a glider.

He queried it with Wycombe Air and reported the incident to them, but they were not aware of the other ac. He assessed the risk as being high.

THE ROBIN DR400 PILOT reports flying a red and white ac with the strobe switched on and with no SSR fitted on a local glider towing flight. While descending from an aero tow at about 95kts, after dropping off the glider, and when between 1600 and 1500ft (QFE) he saw what appeared to be an all white twin piston ac about 400m away in approximately his 9 o'clock and about 1 to 200ft below him and climbing.

As he had an 180ft long tow rope attached he did not want to slow down, so he increased the throttle setting to check the rate of descent and put on about 10° of right bank to make himself more conspicuous in case the twin pilot had not seen him. He checked to ensure that the twin would pass well behind him and estimated that it did so by about 250 to 300m. He was not able to estimate the vertical separation as by that time he was concentrating on what was ahead.

He was not sure what time this incident occurred, as he did not note it at the time and there was subsequent confusion. He did not assess the risk, as he was visual with the other ac throughout.

UKAB Note (1): Initially there was confusion as to which tug ac was involved (the club operates two) and the colour reported by the BE76 pilot was more akin to the other ac which was airborne earlier on the same day, piloted by a different pilot. There was also a lack of understanding of BST/UTC by some personnel. With the benefit of the RT transcript however, there is little doubt that the DR400 involved in the incident was that being flown by the reported pilot. Both Robin pilots were on holiday

during the period of the investigation which delayed an accurate reconstruction of events, despite the full co-operation of the gliding club involved.

UKAB Note (2): The recording of the Heathrow radar shows the incident. The DR 400, which was not SSR equipped, crosses from R to L ahead of the BE76 that is climbing through an alt of 2100ft on the London QNH of 1020. The DR400 disappears on the sweep before the CPA, but it is assessed that it passes 250m ahead (closing); the vertical separation cannot be calculated.

ATSI reports that Wycombe is situated within an ATZ, circle radius 2nm, up to 2000ft aal. (Aerodrome elevation 520ft.) and they were operating from RW24.

Radar recordings show that the CPA occurred 1.9nm SW of the airport, i.e. near to the lateral boundary of the ATZ, when the BE76 was at an alt of 2100ft. The DR400 was showing as a primary only contact but it was reported by the BE76 pilot to be at a similar alt and descending.

The Wycombe MATS Part 2 defines the allocation of the ATZ as follows:

> *'The ATZ is divided into two basic sections to separate glider operations from powered (fixed wing and rotary) operations. A Safety Buffer Zone has been established to provide separation between the Gliding Section and the Power Section airspace. The boundaries of the Safety Buffer Zone extend to the limits of the ATZ and are defined as follows:*
>
> *When R/W 06/24 is in use:*
>
> *The Power Section Boundary is defined as the southern edge of R/W 06/24 Grass. The Gliding section Boundary is defined as a line positioned parallel to and 30m south of the Power Section Boundary. Unless prior approval has been given, e.g. during gliding competitions, no Gliding Section traffic is permitted to enter the Power Section airspace* ***at or below 1400ft QFE (1900ft QNH)****. Similarly, unless specifically authorised by ATC and Gliding Co-ordinator, no Power Section traffic is to enter the Gliding Section airspace at or below 1400ft QFE (1900ft QNH).'*

The Safety Buffer Zones map, in the MATS Part 2, shows the boundary diverging slightly to the left abeam the RW06 threshold. This reflects the Noise Abatement route for RW24 departures. Basically, this is *'after crossing the airfield boundary, turn left of runway centre-line by about 10° to track towards a point which is halfway between Parmoor and Rockwell End hamlets'.* There is also a warning *'beware of gliders and glider-tugs to the left of climb-out track'*.

Additionally, there are 'Warning Procedures' to assist ATC in the safe use of the tarmac taxiway and the associated hover-taxy route between "X" and "R". The MATS Part 2 states:

'When Runway 24 is in use: All powered aircraft, including glider tugs and motor gliders, together with gliders wishing to participate, will advise "late downwind" using the promulgated frequency of the day. The ATC response will be:-"c/s – Taxiway Secure".

This response will be made when the taxiway between points "A" and "B" is unobstructed. At the time of the Airprox both the Aerodrome and Ground positions were in use. In accordance with the local procedures the DR400 (the correct callsign) glider tug reported, on the **Ground** frequency, at 1249, "*Tug (c/s) late downwind"* and the controller responded *"Taxiway secure"*. Meanwhile, the BE76 had received taxi clearance on the Ground frequency at 1234 and had received its clearance, towards DTY remaining clear of CAS, at 1243. The BE76 was transferred to the Tower frequency at 1246 and received take-off clearance at 1247.

Both ac were operating in accordance with local procedures. The Airprox occurred virtually on the boundary line of the Safety Buffer Zone but reportedly above its upper altitude of 1900ft.

UKAB Note (3): The UK AIP at EGTB AD 2.22 – FLIGHT PROCEDURES – at f iii states:

'Pilots of aircraft flying within the Wycombe ATZ are responsible for providing their own separation from other aircraft operating within the ATZ'.

UKAB Note (4): As a result of this incident the Wycombe MATS Part 2 has been slightly amended to clarify the procedures.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, transcripts of the relevant RT frequencies, radar photographs/video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC authorities.

The Board noted that, despite some confusion, the respective pilots and the gliding club had co-operated fully with the investigation thereby ensuring as accurate a reconstruction of events as possible.

Despite that the incident had taken place in the Wycombe ATZ, it took place outside the area of that ATZ where local glider/powered ac deconfliction procedures applied and the Board had no reason to question their appropriateness. Neither pilot was required to be, nor was, in receipt of an ATC information or deconfliction service (indeed no such service was available) and therefore both ac were being operated under the Rules of the Air (RoA) and the 'See and Avoid' principle as notified in the UK AIP (UKAB Note (3)). In this case, both pilots had seen the opposing ac and the reporting pilot had deemed that no avoidance was necessary as the tug pilot was already avoiding his twin. Under the RoA, as the ac approached one another, the Beech was required to give way to the tug however, since it was already in a right turn when the pilot of the twin spotted it, Members considered it understandable the pilot considered that further action was not required, even though the separation might have been less than ideal. Even bearing this in mind however, the Board decided that since the Robin pilot had seen the Beech throughout the incident and the Beech pilot saw the Robin in the later stages, there was no risk that the ac would have collided.

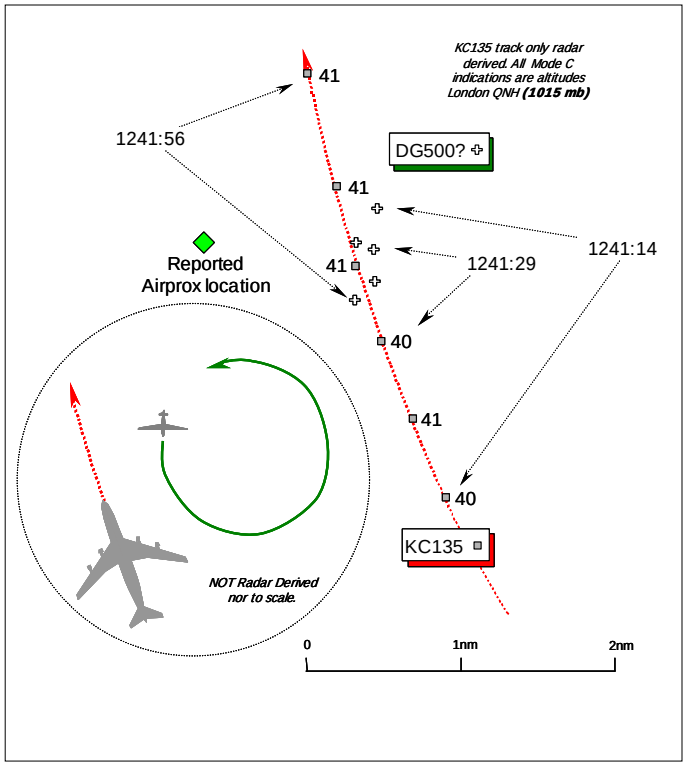
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Late sighting by both pilots.

Degree of Risk: C.

AIRPROX REPORT No 111/07

Date/Time:	28 Jul 1241 (Saturday)	
Position:	5214N 00011W (2nm E St Neots)	
Airspace:	London FIR	(*Class:* G
	Reporting Ac	*Reported Ac*
Type:	DG500 Glider	KC-135
Operator:	Civ Pte	Foreign Mil
Alt/FL:	3200ft QFE (1005mb)	4000ft QNH
Weather Visibility:	VMC CLBC 15nm+	VMC NR
Reported Separation:	500ft V/400m H	NK
Recorded Separation:	Not recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE DG500 GLIDER PILOT reports he had departed from Gransden Lodge and was monitoring frequency 131·275MHz. After circling in a weak thermal he headed off to the S towards other clouds at 60kt in a level cruise at about 3200ft Gransden QFE (possibly 1005mb – Gransden elev: 254ft), flying some 2000ft below and 1-3nm clear of cloud with an in-flight visibility of 15nm+. About 1nm E of St Neots heading 180° at about 1245UTC, he sighted the other ac – a grey KC135 – about 1nm away some 50° R of the nose. He noted that it was definitely higher than him but estimated their paths would come close or cross. Concerned about possible turbulence from the turbofan ac, to avoid the KC135 he turned away to port and the jet passed behind his glider with a low risk of a collision. He estimated the minimum separation was about 400m horizontally and 500ft vertically and he saw it fly away as he came around the turn. It did not appear as though it's pilot had deviated from his course.

THE KC-135 PILOT reports that they executed 2 flypasts at Duxford prior to and on completion of AAR training in AARA 8. After the first flypast they departed from the vicinity of Duxford at about 1240UTC, operating in VMC heading NW, at an altitude of 4000ft under VFR at 250kt and were not in receipt of an ATS at the reported time of the Airprox. Although gliders were seen in the vicinity, none were close enough to require any avoiding action and they were unaware of any "close calls". The landing light and HISLs were all on.

Returning from a second flypast at around 1445, the crew observed gliders in the vicinity and actually took avoiding action on one glider in level flight, but made an uneventful return to base.

UKAB Note (1): This Airprox is not shown on radar recordings. The KC135 is shown NNW bound passing about 1nm to the E of the reported Airprox location, some 3½min before the approximate reported time at 4000-4100ft London QNH (1015mb). Several primary radar returns are evident in the vicinity - some 2nm E of St Neots - but none are completely consistent with the track reported by the DC500 glider pilot, hence they might not correspond to the glider flown by the reporting glider pilot.

US 3AF-UK comments that it looks reasonably certain, given the significant time difference, that the glider avoided by the KC-135 was not the glider flown by the reporting pilot. Either the KC-135 crew

did not spot the reporting pilot's glider or saw it and judged it to be sufficiently far away not to require avoiding action.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, radar video recordings and a report from the appropriate operating authority.

The Board's HQ 3AF-UK Advisor observed that it was relatively unusual for a KC135 to be operating over South Cambridgeshire in the FIR at 4000ft amsl on a Saturday afternoon. Such large ac would not normally be encountered lingering at these altitudes, but it was evident that their participation in air shows clearly necessitates their legitimate transit through Class G airspace. The glider pilot Member was concerned that apparently no prior liaison about the transit of such a large ac through the 'Open FIR' had been effected with gliding clubs in the vicinity beforehand, which the Member thought might have been helpful. However, it was clear that the crew were legitimately proceeding about their VFR transit flight, outbound from their flypast to commence AAR training in AARA8. On a similar vein, a Member observed the increasing regularity with which large airliners might be encountered unannounced completing approaches to regional airports in unregulated airspace. The Member opined that, as a result, it is becoming more common to spot large ac in the lower altitudes of Class G airspace, where see and avoid predominates.

The KC135 crew's brief account revealed that although gliders were seen in the vicinity on their first northbound transit, none that they saw were close enough to require any avoiding action. The radar recording reflected that the subject KC135 had transited about 1nm to the E of the reported Airprox location some 3-4mins before the time reported by the glider pilot, so it seemed reasonably clear it was the ac involved. However, the absence of any consistent radar data on the glider made analysis of the geometry somewhat problematic. Thus it was not clear if the KC135 crew saw the subject glider, or not.

The glider pilot reported that he spotted the KC135 about 1nm away, but definitely higher than his glider's altitude at the time he said. The Board noted that the DG500 pilot had wisely elected to turn away from the large jet, which passed astern and no closer than about 400m horizontally and 500ft vertically above his glider at the closest point - with a low risk of a collision. Without complimentary SSR data it was not possible to confirm the glider pilot's assertion as to the minimum separation that pertained here independently, but there was no reason for the Board to doubt the veracity of the reporting glider pilot's account whatsoever. Whilst noting the DG500 pilot's concern about possible turbulence from the turbofan ac, the Board was charged with determining the risk of collision between the ac involved and not what might have resulted if the wake turbulence of the large ac had affected his glider in different circumstances. In the Board's view, the glider pilot had seen the KC135 in time to turn away from it and maintain his own separation well clear of the KC135, which passed 500ft above his glider thereby removing any risk of a collision. The Board concluded therefore, that this Airprox had resulted from a sighting of traffic operating in Class G airspace, where no risk of a collision had existed in these circumstances.

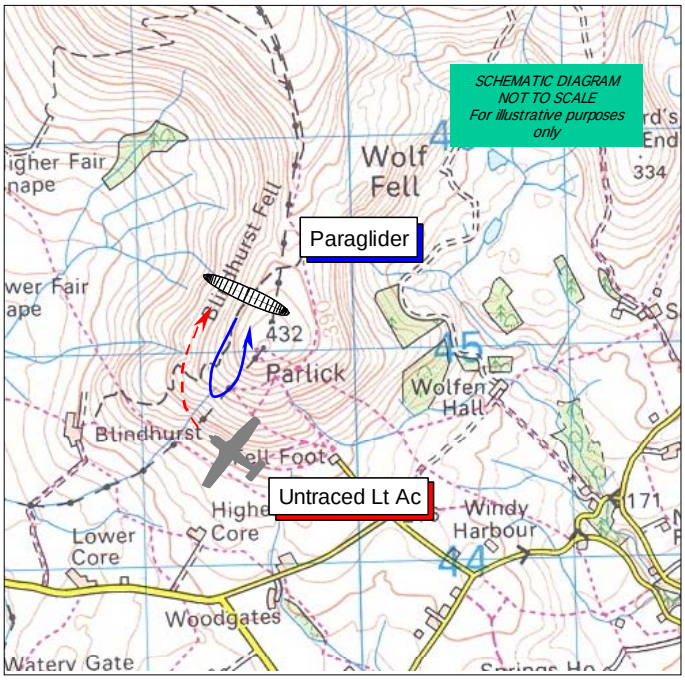
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting Report.

Degree of Risk: C.

AIRPROX REPORT No 115/07

Date/Time:	1 Aug 0900	
Position:	5354N 00237W (Parlick)	
Airspace:	London FIR	(*Class:* G
	Reporting Ac	*Reported Ac*
Type:	Paraglider	Light Ac (Untraced)
Operator:	Civ Pte	N/K
Alt/FL:	1400ft amsl	NR
Weather	VMC CLBC	NK
Visibility:	100km	NR
Reported Separation:		
	Nil V/20yd H	NR
Recorded Separation:		
	Not recorded	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE GIN ZULU PARAGLIDER PILOT reports he was soaring the hill at Parlick on his own, parallel to the western facing slopes in a southerly wind, at about 420-430m [~1377-1410] just level with the top when he heard a light ac (LA) coming around the corner to the S. He expected it to cut straight across the bowl away from the ridge to the W, but the LA just turned N and contoured the hill at about his level or slightly higher. Knowing about the 'rotor' wash a paraglider can take from a LA he became very worried as the ac headed "straight for him" with no avoiding action. He had two choices, try and ride the 'rotor' and risk a collapse or turn into the hill onto a downwind leg, which he did. He turned L NNE'ly at 10-20kmph and landed hard, taking quite a knock. At the closest point the LA passed about 20yd to the W. He assessed the risk as *"high"*.

THE RADAR ANALYSIS CELL (RAC) AT LATCC (MIL) reports that the absence of any detailed information, coupled with no recorded radar data on the LA to assist the trace have prevented the RAC from identifying the reported LA. Therefore, despite exhaustive enquiries the LA remains 'untraced'.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available was unfortunately, only a report from the paraglider pilot.

Clearly the absence of any other amplifying information had prevented the RAC from identifying the reported LA here. Consequently, without a report from the LA pilot the investigation was very unbalanced and it was therefore difficult for the Board to come to any meaningful conclusions. However, there was no reason to doubt the veracity of the paraglider pilot's report and it seemed at face value to be a very close call. The paraglider pilot's account reflected that the LA had been masked by the terrain until he spotted it approaching from around a hill. Members deduced from the paraglider pilot's account that he was poorly placed by the sudden appearance of conflicting traffic and with few options available, his elected recourse was then to turn downwind and land. The glider pilot Member cited this Airprox as an example of what can happen if aeroplane pilots fly too closely to windward facing slopes where paragliders can be encountered at any time. Wiser airmanship would be to give such likely sites a wider berth until it could be clearly established that no other ac are

around. Some Members suggested that the cause might be that the untraced LA pilot flew sufficiently close to the paraglider to cause it's pilot concern, but this presupposed that the LA pilot might have seen the paraglider, which could not be determined. In assessing Cause and Risk the Board could only base their assessment on what had actually happened rather than what might have occurred if circumstances had been slightly different. Here, the paraglider pilot saw the LA and elected to turn towards the hill and land to avoid it, thus on the limited information available the Board could only conclude that this Airprox had been the result of a conflict with an untraced LA, which had been resolved by the paraglider pilot.

Clearly, in effecting a downwind landing the paraglider pilot was increasing the potential risk of injury to himself from a fast, hard landing - a risk that had to be balanced against a possible collision. Here it was worth pointing out that the Board was under remit to assess an Airprox on the basis of risk of collision with another ac, which did not encompass the overall compromise to a pilot's safety by having to land downwind, with all that this potentially entails; nor would it necessarily encompass any potential for the collapse of his wing from the effects of turbulence induced by the LA's passage. Fortunately, the paraglider survived the hard landing relatively unscathed but he should not have been placed in that situation by the LA pilot in the first instance. However, it was clear that the paraglider had limited time to detect and sight the LA, deduce where it was going and decide what to do. Having elected wisely to get out of the way of the LA and forestall a collision by turning downwind to land, this still apparently resulted in a mere 20yd horizontal separation at the closest point as the LA flew past. On this basis the Board concluded unanimously that the safety of the paraglider and the untraced LA had been compromised.

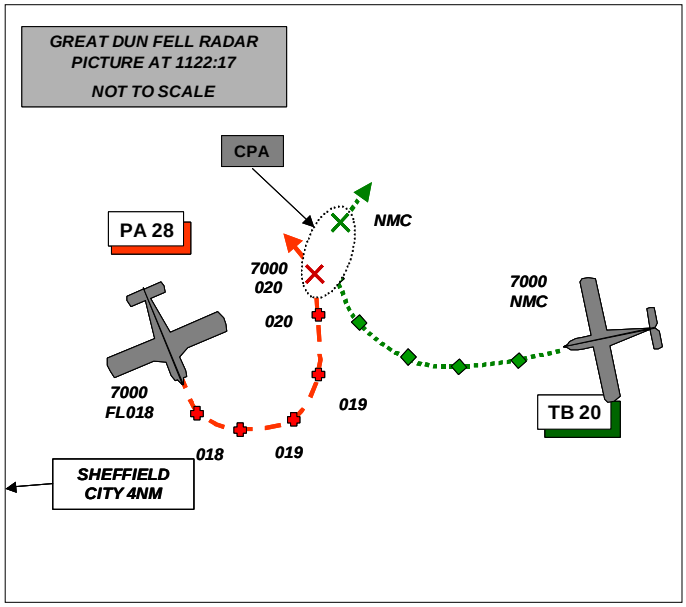
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict resolved by the Paraglider pilot.

Degree of Risk: B.

AIRPROX REPORT No 116/07

Date/Time:	11 Aug 1123 (Saturday)	
Position:	5324N 00127W (Sheffield VRP)	
Airspace:	Lon FIR	(*Class:* G)
	Reporting Ac	*Reported Ac*
Type:	TB20	PA28
Operator:	Civ Pte	Civ Club
Alt/FL:	1950-2000ft (QFE)	1500-1800ft (QNH 1015mb)
Weather	VMC CLOC	VMC NR
Visibility:	>20nm	10km
Reported Separation:	100ft V/100ft H	Level V/1nm H
Recorded Separation:	NR V/0.2nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE TB20 PILOT reports that he was flying a transit from Gamston to Sheffield accompanied by a friend. He had all lights on and was squawking 7000 with Mode C [he thought]. He was heading 280° at 105kt having just left Doncaster Radar and switched to Sheffield Radio (A/G). When they were about 5-8nm from Sheffield VRP, he saw a white ac to the N and tracking S. He asked his friend to check with Sheffield about the traffic and they said they were the only ac on frequency. They continued to watch the ac and it appeared to track between VRP and Sheffield City, then headed E towards the VRP and commenced orbits around the VRP. (See radar analysis at UKAB Note (1)) Again Sheffield was asked about traffic and they repeated that they were the only ac on frequency. He set the landing configuration and became further concerned as the ac's orbit seemed to vary and as they approached the VRP the ac was in their 10 o'clock just above them heading directly towards them but in a slight left turn. He then made an avoiding action right hand descending turn and reconfigured the ac bringing the gear and flaps up. They then called Sheffield again to advise them of avoiding action and if they were in contact with the ac as they had not heard it on the frequency.

They advised Sheffield that they were going to conduct 1 orbit whilst they tried to locate the other ac and failing to do so they then advised them they would commence a second RH orbit.

During the second orbit they then heard a PA28 call Sheffield with a partial callsign and advise Sheffield that they were *"2 mile final land"*. They then contacted Sheffield again to confirm their request to land and began the approach whilst also advising Tower that they thought that the other pilot had not seen them.

The PA28 ac landed ahead of them but was very slow to backtrack and vacate the RW.

After landing he contacted the other pilot and advised him that this was a serious incident and he offered his apologies and added that this was his first solo flight from Sheffield.

He assessed the risk as being very high.

THE PA28 PILOT reports flying blue and white ac on a training flight (his first solo from Sheffield), with all lights selected on and squawking 7000 with Mode C. On recovery, he arrived at the Sheffield

City VRP earlier than anticipated and as a result was late changing frequency from Doncaster APR to Sheffield Radio. In order to give himself time he decided to make one orbit at 95kt over the VRP so that he could make his initial call to Sheffield. He was initially told that he was number 2 to land but he could not see any ac ahead of him. As he was turning through a heading of 180° he saw the other ac approximately 1–1.5nm to the W of the VRP and he reported visual with it and said that he was ahead of it. The other ac said he would hold whilst he landed, which he subsequently did. He considered that no Airprox had occurred at any time during the evolution since the other ac was never closer than 1-1.5 nm and neither pilot took any avoiding action; accordingly he considered the risk to be none.

UKAB Note (1): The recording of the Great Dun Fell radar shows the incident. As the recording starts at 1119 the PA28 is squawking 6162 (Doncaster Sheffield) and indicating FL019 (1700ft alt) and the TB20 with no Mode C and both ac are tracking 300°. They both turn left in turn onto a W track and approach the VRP from the E on very similar ground tracks with the PA28 now having changed to a squawk of 7000, 2nm directly ahead of the TB20. At 1121:23 the PA28 commences left hand orbit at the VRP (one only), while indicating FL017. At 1122:06 the TB20, still on a Westerly track, is in the PA28's 12 o'clock at a distance of 0.4nm, the former having completed ¾ of his orbit and the latter having just started an orbit to the right. The PA28 rolls out on a heading of 360° briefly (2 sweeps) before turning left inbound to Sheffield at 1122:47 while the TB20 continued the orbit (one only) to the right before also turning inbound at 1123:55 now 3nm behind the PA28 and following the same ground track.

UKAB Note (2): The Doncaster Sheffield METAR for 1120 was:

1120 240/13 9999 FEW 2000 SCT 3500 19/10 1007

UKAB Note (3): The investigation revealed that there were inconsistencies and inaccuracies in the notification of the Sheffield VRP. This has been addressed by the CAA and the management of Sheffield City Airport.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac and a radar video recording.

Although this incident may technically have taken place while both ac were approaching Sheffield City Airport, it was well away from the ATZ and in reality was in the open FIR where no restrictions were in place and the 'see and avoid' principle applied.

Some Members were surprised that this occurrence was reported as an Airprox as it was not readily evident where the safety of either ac may have been compromised since the reporting pilot saw the other ac throughout, was in complete control of the positioning of his own ac and could, and in the view of some GA Members should, have avoided the PA28 by a larger margin had he chosen to do so.

Specialist GA Members considered that the inexperienced PA28 pilot reacted in an entirely appropriate manner by conducting an orbit when he found events unfolding rather more quickly than he had anticipated, something that happens to almost all inexperienced pilots. Far better, they thought, to make an orbit and take stock rather than to fly off into the unknown well 'behind the drag curve'. Although his estimation of the separation was shown by the radar analysis to be inaccurate, so was that of the more experienced TB20 pilot and, as is often the case in such incidents, the correct answer lay midway between the two estimates.

Members agreed unanimously that there had been no risk of collision and that this had been a sighting report by the TB20 pilot.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Sighting report.

Degree of Risk: C.

AIRPROX REPORT No 117/07

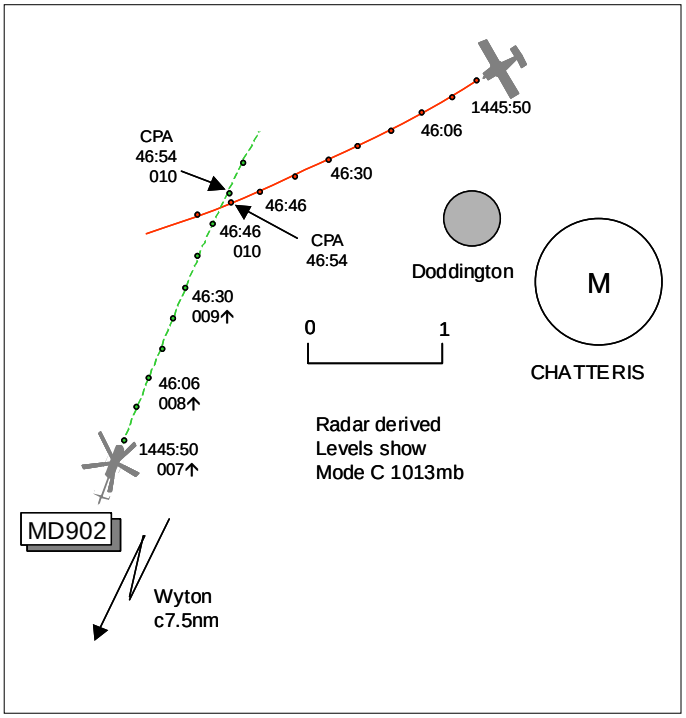
Date/Time:	10 Aug 1447	
Position:	5230N 00001E (9nm NNE Wyton)	
Airspace:	LFIR	(*Class:* G)
	Reporting Ac	*Reported Ac*
Type:	MD902	Untraced Light ac
Operator:	Civ Comm	N/K
Alt/FL:	1000ft (QNH 1017mb)	(N/K)
Weather	VMC CLNC	NK
Visibility:	30km	NK

Reported Separation:

150-200ft V

Recorded Separation:

<0·1nm H



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE MD902 PILOT reports heading 025° at 125kt at 1000ft QNH 1017mb and not in communication with any ATSU squawking a discrete code with Mode C. The visibility was 30km in SKC VMC and the helicopter was coloured blue/yellow with anti-collision, nav and strobe lights all switched on. Passing 1·5nm W of Doddington he and his 2 observers were all 'eyes out' maintaining a good lookout in the cruise with A/P engaged, when a low-wing white-coloured single-engined ac was seen at the very last minute in their 1-2 o'clock about 0·5nm away converging. An immediate descent was made to avoid the red-nosed light ac which was seen to pass 150-200ft above flying straight and level. This target was not showing on TCAS and he assessed the risk as 'B'.

RAC MIL reports that despite extensive tracing action the identity of the reported ac remains untraced. The radar recording first shows the reported ac non-squawking about 10nm NE of the Airprox position tracking SW before fading about 2nm SE of Peterborough/Connington tracking W. Peterborough furnished the RAC with their daily movement log but there were no ac entries that would correlate to the reported ac's description or landing time. A wider procedural search of adjacent airfields and landing strips did not identify any ac that matched the reported ac's description.

UKAB Note (1): Met Office archive data shows the Wyton METAR as EGUY 1450Z VRB04KT CAVOK 23/10 Q1018 BLU=

UKAB Note (2): The Claxby and Debden radar recordings were both analysed owing to track jitter being exhibited by the both subject ac's primary and secondary radar returns. The MD902 is clearly seen at 1445:50 approaching the Airprox position tracking 035° climbing through FL007 (850ft London QNH 1018mb) with a primary only radar return in its 1 o'clock range 3·7nm tracking 245°. The 2 ac continue to converge on a line of constant bearing, the MD902 in a slow climb until levelling at FL010 (1150ft QNH) at 1446:46 with the unknown ac in its 1 o'clock range 0·4nm. The CPA occurs on the next sweep as the unknown ac passes just to the R and behind of the MD902 at <0·1nm, the MD902 at FL010 (1150ft QNH).

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included a report from the MD902 pilot and radar video recordings.

It was disappointing that the reported ac went untraced which left Members with only one viewpoint of the incident. This had occurred in Class G airspace where there is equal onus on both pilots to provide their own separation from other traffic through 'see and avoid'. However, to comply with the Rules of the Air, the MD902 pilot was responsible to give way to the other ac approaching from his R. The MD902 pilot had seen the other ac late, pilot Members opining that it may have been obscured by the front door pillar for some time as it approached on a line of constant bearing, only entering his field of view when close-by. That said, these blindspots associated with particular ac types, are known and are normally overcome by the pilot weaving the ac's nose or by moving his head during his lookout scan to 'uncover' those previously obscured areas. Some Members believed that this late sighting had been the cause of the Airprox. However, this view was not shared by the majority who thought that the MD902 pilot had seen the other ac in enough time to discharge his responsibilities adequately, and that this had been a conflict resolved by the MD902 pilot whose avoiding action had quickly and effectively removed any risk of collision.

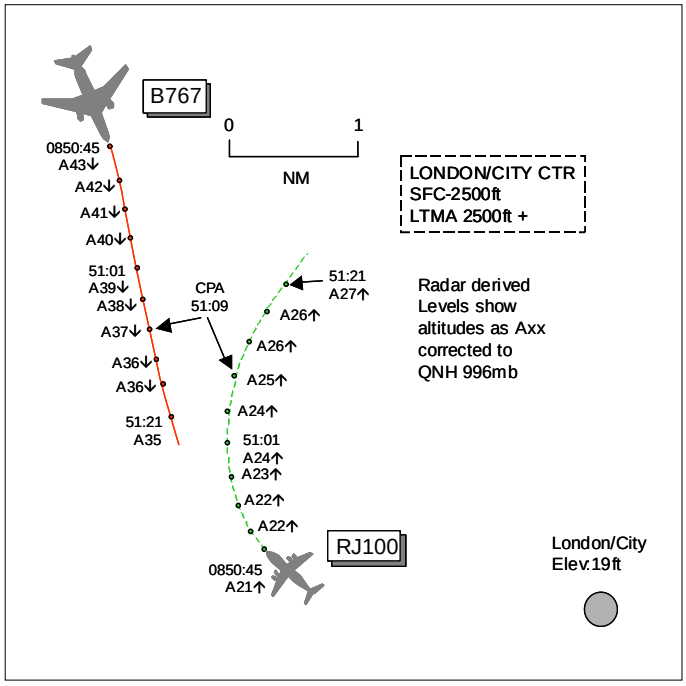
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in Class G airspace resolved by the MD902 pilot.

Degree of Risk: C.

AIRPROX REPORT No 118/07

Date/Time:	15 Aug 0851	
Position:	5132N 00002W (4nm NW London/City - elev 19ft)	
Airspace:	City CTR/LTMA	(*Class:* D/A)
	Reporting Ac	*Reported Ac*
Type:	RJ100	B767-300
Operator:	CAT	CAT
Alt/FL:	2000ft↑ (QNH 996mb)	↓4000ft SAS
Weather	IMC KLWD	NK
Visibility:	10km	NR
Reported Separation:	500ft V/1nm H	NR
Recorded Separation:	1200ft V/0·7nm H	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE RJ100 PILOT reports carrying out a DVR 3T departure from RW28 at London/City and in communication with Thames Radar on 132·7MHZ squawking 5242 with Mode C. Tracking 050° at 190kt to intercept the 083° radial from the LON VOR and climbing through 2000ft a TCAS contact was noted as proximate traffic 3nm away 1700ft above descending towards O/H. This became a TA alert approximately +1300ft then proximate traffic again, always descending, to +500ft before finally passing 1nm behind. At the time of the incident, their ac entered a cloud layer at 1500ft and was IMC in cloud. They advised Thames and were informed that the other ac was descending into Heathrow and had 'level bust'.

THE B767 PILOT provided a brief report. On radar vectors for RW27L to Heathrow they were given clearance to descend from FL80 to 4000ft but they did not set altimeter from SAS 1013mb to 996mb at time of the clearance. They descended approximately 500ft below their cleared altitude which was pointed out to them by ATC and regained altitude and continued their approach. The FO was going to change the altimeter at the time of clearance but he, the Capt, had it in his mind that the transition level and transition altitude were both at 6000ft.

THE THAMES RADAR CONTROLLER reports that at 0849 the RJ100 departed London/City RW28 climbing to 3000ft. On first contact he asked the flight to squawk 'ident' and maintain 3000ft as Heathrow inbounds descend to 4000ft above. This was the only flight on his frequency at the time but 3 more departures required release and several inbounds were about to call. At about 0851 the Heathrow INT N alerted him to the fact that the B767 had 'level bust' by descending through its cleared level of 4000ft. At the same time the RJ100 crew reported he had a TCAS RA, he thought, but the traffic had already passed behind. No avoiding action was necessary as the B767 descended through 4000ft as the subject ac passed abeam each other.

THE HEATHROW FIN DIR reports the B767 was heading 180° on a base leg for RW27L from the N with the ac's Mode S selected flight level (SFL) showing 40 and his fps showing it had been cleared to 4000ft on QNH 996mb. He saw a London/City departure climbing out. As the 2 blips merged on radar it was difficult to see the actual altitude but as they separated slightly the B767 was at 3600ft descending with the outbound [the RJ100] showing 2600ft climbing; by this time the ac were on diverging tracks. He asked the B767 flight to confirm he was descending to 4000ft on QNH 996mb as there was traffic on their LHS, which he had just passed, climbing to 3000ft. The crew replied they

were descending on 'standard setting' i.e. 1013mb. He had already given the B767 crew TI on the other ac and they were diverging so there was no avoiding action he could give other than tell the crew to maintain 4000ft on QNH 996mb which he did. The B767 then climbed back up to 4000ft and established on the ILS before landing normally.

ATSI comments that the B767 flight was inbound to Heathrow and, having been given descent clearance to 4000ft, was transferred from INT to FIN. The unit investigation confirmed that the correct QNH of 996mb was passed by INT and read back by the B767 crew. The crew called FIN at 0849:20 and reported passing 6600ft for 4000ft. The radar pictures shows that 4000ft was the SFL, however, the Mode C indicated the ac passing 6100ft rather than 6600ft as reported. The FIN instructed the crew to turn R onto 140° before a further R turn onto 180° and a speed reduction to 180kt.

The RJ100 flight departed London City and contacted the Thames Radar controller at 0850:45. The crew reported passing 2200ft for 3000 on a Dover 3T departure. At this time the B767 was NNW of the RJ100 by 3·4nm with the B767 passing 4300ft in descent. At 0851:15, FIN instructed the B767 crew to turn R heading 195° which they correctly read back. The FIN immediately instructed them to maintain 4000ft, as their Mode C indicated 3500ft. The crew acknowledged this and FIN informed them of their Mode C read out together with the fact that they had passed traffic on their LH side (the RJ100) at 2800ft. The B767 crew then transmitted "*Say the altimeter again nine nine six*?" to which the FIN replied "*Affirm, nine nine six*". Meanwhile, the RJ100 crew asked the Thames controller what the traffic was that they had on TCAS which passed "*…just above us and pretty close really*". The Thames controller advised that it was traffic that had 'bust its level' whilst inbound to Heathrow.

The FIN asked the B767 crew what QNH setting they had set. This question had to be put several times due to other flights transmitting but the crew did reply advising: "*We had standard (B767 c/s)*".

The radar recording shows that the B767 was S'bound on its heading whilst the RJ100 was turning R following the SID. The two ac passed port-to-port at a range of 0·7nm with the B767 1200ft above the RJ100. At 0851:21, the RJ100 was in the B767's 7 o'clock at a range of 1·4nm and 800ft below. As the two ac were heading away from each other lateral separation was quickly restored.

UKAB Note (1): STCA did not activate.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, transcripts of the relevant RT frequencies, radar video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC authority.

Pilot Members agreed that the B767 crew did have 2 options available as to when to set the QNH. Firstly, as recommended by the UK AIP, when the flight vacated a FL descending to an altitude the pilot would set the aerodrome QNH unless further FL vacating reports had been requested by ATC, in which case, the QNH would be set following the final FL vacating report. A second option would be to set the QNH after descending through the transition altitude. In either case, company SOPs should detail which procedure the crew would be expected to follow and a crosscheck within the B767 cockpit should have detected that the crew still had 1013mb set. Members agreed that the cause of the Airprox was that the B767 crew did not set the QNH and had descended below their cleared altitude.

Looking at the inherent risk, the RJ100 crew had seen the B767 approaching on TCAS as proximate traffic, well above them but descending, and had wisely monitored its progress. The B767's TCAS computed flight path had then generated a TA on the RJ100's TCAS display before moderating to proximate traffic once more; the B767 was reported as passing about 1nm away and descending to within 500ft vertically at the closest point. Whereas the radar recording reveals the subject ac passing abeam each other by 0·7nm with over 1000ft vertical separation after the tracks diverge, with

the vertical separation only reducing further as the B767 levels-off at 3500ft and the RJ100 continues to climb to 3000ft. The good situational awareness shown by the RJ100 crew when combined with the actual geometry of the incident convinced the Board that safety had been assured during this encounter.

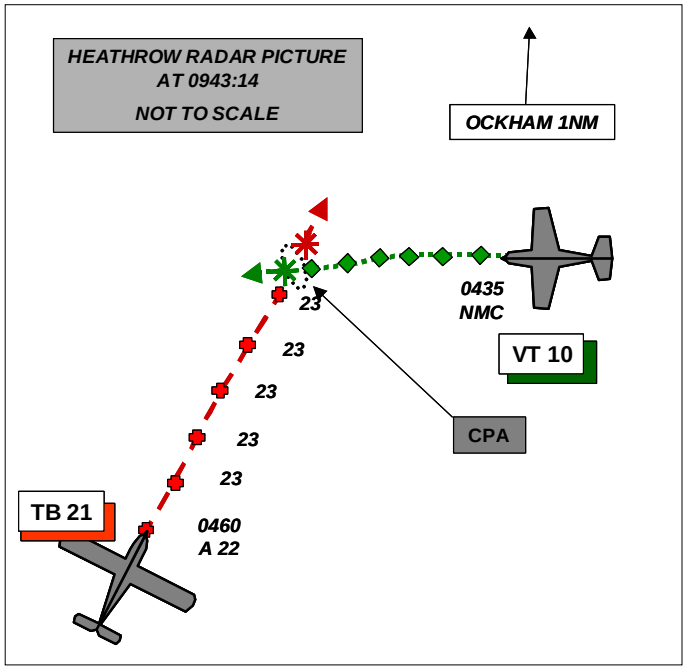
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The B767 crew did not set the QNH and descended below their cleared altitude.

Degree of Risk: C.

AIRPROX REPORT No 120/07

Date/Time:	5 Aug 0943 (Sunday)	
Position:	5117N 00027W (2nm S Ockham OCK)	
Airspace:	LON FIR	(*Class:* G)
	Reporting Ac	*Reported Ac*
Type:	Victa Airtourer	TB21
Operator:	Civ Club	Civ Pte
Alt/FL:	2400ft (QNH 1011mb)	2300ft (QNH NR)
Weather Visibility:	VMC CAVOK >10km	VMC CAVOK >10km
Reported Separation:	<50ft V/0 H	NR
Recorded Separation:	(estimated 0 H)	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE VICTA AIRTOURER (VT10) PILOT reports flying a red and white ac with the red beacon switched on, on a private flight from Rochester to Compton Abbas. SSR was fitted but with no Mode C. After leaving Rochester to the W he contacted Biggin Hill for a FIS and he passed Biggin Hill to the S along the M25 at 105kt and then to the N of the London Gatwick TMA at 2400ft. He continued on a heading of 270° and once S abeam Kenley he contacted Farnborough Radar who told him to squawk 0435. He was identified and given FIS, passed his route and was 'cleared' direct to OCK, remaining at 2400ft on the London QNH of 1011mb.

En-route to OCK he was advised by Farnborough Radar of a Helicopter travelling in the opposite direction which he saw slightly to his right and beneath him by about 1000ft. He then passed about 1.5nm to 2nm to the S of OCK still at 2400ft.

When he was S of OCK he looked down at his map momentarily to check his next track which was 255° and took him direct to Compton Abbas. After a few sec he looked back to his front and saw an ac immediately in front of him 200ft away and about 50ft higher and heading straight towards him. Within a second the ac passed above him and continued on its track. There was no time to react and take any avoidance.

The other ac was a low wing; single engine ac with a retractable undercarriage, he thought possibly a Piper Arrow or a TB10; it was white underneath and had a registration mark on one wing but it passed too quickly to read it.

Once S abeam Farnborough he called Radar to clarify his clearance into the Odiham MATZ and was again given the same transponder code and told was on receipt of a FIS as though he had made an initial call. He thought this was strange since he had already been given this service a few minutes earlier so he thought that there had been a change of controllers between his calls.

He assessed the risk as being high.

THE TB21 PILOT reports that he was contacted by West Drayton ATC who advised that an Airprox had been reported. He was flying a private flight from Jersey via OCK and Eastwards to Biggin Hill in

a grey, red and white ac with strobes and nav lights switched on. He was squawking as directed with Mode C and was cruising at 2300ft on the London QNH [1011] and at 130kt, in receipt of a RIS from Farnborough RADAR. He recalled that the weather was good with very clear visibility and the traffic was heavy. Rather than flying directly over the beacon he normally routes slightly off the beacon for good practice as many others route directly over the beacon just below the CAS; on that flight he routed 1nm SW of the beacon.

He does not recall seeing any other ac in close proximity and was not given any avoiding action or TI by ATC at that location.

UKAB Note (1): The recording of the Heathrow Radar showed the incident. The Airtourer, squawking 0460, routes 1nm to the S of OCK tracking 260° but shows NMC, while the TB21 tracks about 030° towards the beacon. The CPA occurred between sweeps as the ac cross but the minimum horizontal separation is projected as being zero; the TB21 indicates an alt of 2200ft. As the diagram shows the ac approach on a line of constant bearing with the Airtourer slightly slower than the TB21 and maintaining a position in its 1 o'clock.

ATSI reports that the pilot of the Airtourer called Farnborough Radar at 0936:10, and reported routeing via OCK and SAM at 2400ft, present position 11nm E of OCK and requesting a FIS. The controller confirmed that a FIS would be provided and allocated a squawk of 0435. At 0937:10, the TB21 pilot called and was asked to standby. Shortly afterwards the controller requested the pilot to pass his details and he stated that he was abeam MID at 2500ft and "*….request Flight Information Service er Radar Information Service*".

The controller advised that it would be a FIS and allocated a squawk of 0460. At 0938:25, the controller advised the Airtourer pilot that he was identified 8nm E of OCK and reiterated that he was in receipt of a FIS. At 0940:10 the TB21 pilot was informed that he was identified 3nm N of Dunsfold, in receipt of a FIS, and passed TI on two nearby contacts. Shortly afterwards a change of controller took place and the position was manned by a mentor and a trainee.

The new controller advised the TB21 pilot that on his initial call he was actually within the London TMA (just E of MID at 2500ft) and to check his routeing, which the pilot acknowledged. There were no further transmissions from either of the subject pilots until shortly after 0944:30, when the controller informed the TB21 pilot that he was about to enter the Heathrow CTR and to turn right at least 20º.

UKAB Note (2): An analysis of the radar recording which was similar to that at UKAB Note (1) was provided.

It is evident from the RTF that the controller was busy at the time and, in accordance with the terms of a FIS, as specified in MATS Part 1 Section 1, Chapter 1, page 2, para 6.2: '*…..controllers will, subject to workload, provide pilots with information concerning collision hazards to aircraft operating in Class C, D, E, F and G airspace where self evident information from any source indicates that a risk of collision may exist. It is accepted that this information may be incomplete and the controller cannot assume responsibility for its issuance at all times or for its accuracy*'.

The pilot of the TB21 made no mention of routeing towards OCK and it might reasonably have been assumed that once clear of the Gatwick CTR a track of approximately 070º would have been followed to take the ac direct to its destination of Biggin Hill, thus remaining well S of OCK.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac, transcripts of the relevant RT frequencies, a radar video recording, reports from the air traffic controllers involved and reports from the appropriate ATC authorities.

This very serious incident took place in a very busy portion of the London FIR where many GA aircraft route, in both directions, around the London CTR and below the TMA, where the 'see and avoid' principle applies. The congestion is exacerbated near navigation beacons. Both pilots had, in the view of the Board, wisely opted for an ATC Information Service and both had again wisely avoided the overhead of the beacon, thus minimising the collision risk; in this case unfortunately neither proved to be successful. Fortunately however, they had opted to fly at differing altitudes, albeit by only 100ft or so, as this had almost certainly been the only factor that had prevented the ac from colliding.

Although Farnborough Radar can be very busy indeed, specialist GA Members strongly urged that pilots make use of it where possible but also emphasised that it is only an aid to good lookout and, like any other such unit, they can become loaded to the extent that controllers do not see or warn pilots of every confliction.

As witnessed in this incident navigating in that complex area can also be difficult, time consuming and can reduce the time available for look out; specialists again wished to remind pilots that good practise is to interrupt tasks such as map reading, frequency and squawk changes and intersperse short spells of lookout.

Since the Airtourer pilot did not see opposing ac in time to react and the TB21 pilot did not see the Airtourer at all, Members agreed unanimously that there had been an actual risk that the ac would have collided.

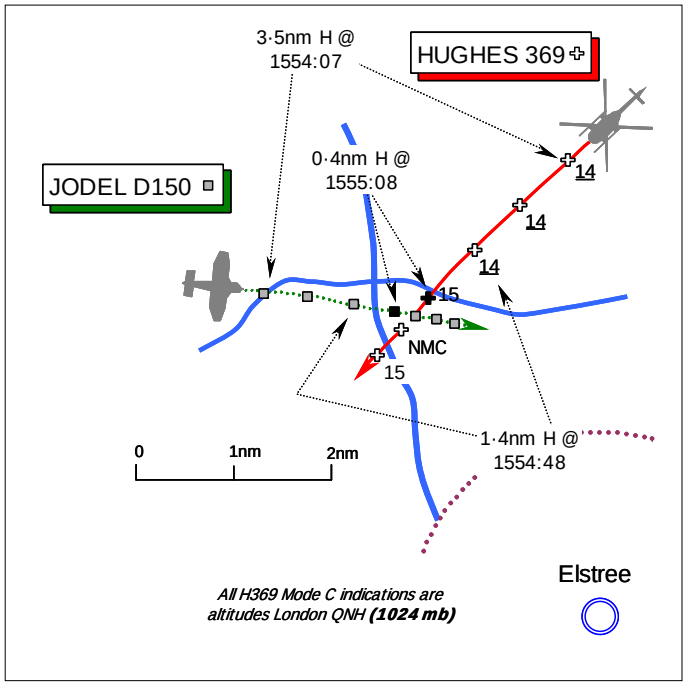
PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A non-sighting by the TB21 pilot and effectively, a non-sighting by the Victa Airtourer pilot.

Degree of Risk: A.

AIRPROX REPORT No 148/07

Date/Time:	5 Oct 1555	
Position:	5142N 00022W (3½nm NW by N from Elstree)	
Airspace:	London FIR	(*Class:* G
	Reporting Ac	*Reported Ac*
Type:	Jodel D150	Hughes 369
Operator:	Civ Club	Civ Pte
Alt/FL:	1400ft QNH (1026mb)	1500ft QNH
Weather Visibility:	VMC CLOC 10km+	VMC CAVOK 10nm
Reported Separation:	30-50ft V/nil H	15-20ft V/nil H
Recorded Separation:	Contacts merged	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE JODEL D150 MASCARET PILOT provided a comprehensive and candid account, reporting that he was enroute under VFR from Sleap to Headcorn routeing direct to LIC, thence to DTY, BNN & LAM. A squawk of A7000 was selected but Mode C is not fitted (NMC). At the time of the Airprox, weather conditions were very good and he was flying in VMC, with a visibility of 10km+ and a good horizon, but with some relatively low stratus - base of about 2000ft – visible to the NE.

As it was a very fine day, there was a lot of traffic around and especially flying past the Bovingdon VOR, he saw a lot of GA ac in the locality. For this very reason, he was conscious of other traffic and was keeping a very sharp look out. His track took him past Elstree aerodrome, but not through their ATZ, so he was maintaining a "listening watch" on their frequency of 122·2MHz rather than contacting them, as they appeared to be quite busy.

Flying between Bovingdon and Stapleford in a level cruise at 1400ft, QNH (1026mb), approaching a position some 3½nm NW of Elstree heading 100° at 100kt, he looked down at his chart and then, upon looking up and L, saw a dark coloured black or dark green Hughes 500 helicopter at about the same level closing on a constant relative bearing in his 10 o'clock about 100m away and heading towards him. To avoid the helicopter he immediately pushed forward on the stick into a descent as he wanted to keep the Hughes helicopter in his view as it passed some 30-50ft directly overhead with a *"high"* risk of a collision. No deviation in the helicopter's course was evident and he assumed the helicopter pilot had not spotted his aeroplane.

Whilst annoyed with himself that he only saw the helicopter at a very late stage, especially as he was supposedly keeping a good lookout, he put this down to the fact that the Hughes helicopter was on a steady relative bearing and it was also partly hidden behind his ac's doorframe until he spotted it.

He stressed that he is used to flying in very close proximity to other ac, as a formation and air display pilot, but this was much closer than he would have liked to have been without a formation briefing! If he had not seen the helicopter or altered his height, he believes that they would have collided.

THE HUGHES 369 (H369/500) PILOT reports his helicopter is finished in a disruptive pattern green camouflage scheme, but the 2 HISLs were on whilst flying under VFR between a private landing site near Wattisham to White Waltham at 115kt.

Cruising level at an altitude of 1500ft QNH, in CAVOK weather conditions, he was however flying a heading of 250°(M) directly into the sun with very limited forward visibility. After passing Stansted, he contacted Heathrow initially and was then passed onto Northolt "who had the space". Just after establishing RT contact with Northolt ATC and whilst setting their new transponder code he noticed a "white flash" very close below his helicopter – he quoted about 15-20ft - as another ac passed directly below with a *"very high"* risk of a collision. No avoiding action was taken, as the other ac was not seen until it was already passing immediately below his helicopter. He stressed that with 2 frequency selections and transponder squawk changes in a short period his workload was high, furthermore, the transponder is sited low down on the central radio "stack" in the cockpit.

MIL ACC had nothing to report.

UKAB Note (1): The Heathrow Radar recording illustrates this Airprox, although the H369 is not shown just at the point that the tracks cross. The Jodel – squawking A7000 NMC fitted - is shown flying steadily eastbound on a track of about 100°, crossing over the M25 motorway. The H369 approaches SW bound, squawking A7000, on a steady relative bearing in the Jodel's 11 o'clock at a range of 3·5nm at 1554:07, indicating 1400ft London QNH (1024mb) unverified Mode C. The Jodel maintains it's course S of the M25 motorway, subsequently crossing the M1 and at 1555:08, the H369 has closed to a range of 0·4nm – still in the 11 o'clock - but has now climbed very slightly to 1500ft London QNH. Secondary contact on the H369 is then lost and one primary return of dubious reliability shows in the Jodel's 10 o'clock at <0·15nm - 300yd. The Airprox occurs at 1555:16, as the tracks cross, with no contact on the H369 that is then shown as a primary contact opening in the Jodel's 5 o'clock and rapidly drawing aft, before a Northolt code of A0260 subsequently appears indicating 1500ft London QNH.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the pilots of both ac and radar video recordings.

The candid accounts provided by both pilots had made it clear that neither was in receipt of an ATS at the moment this Airprox occurred and the Board readily agreed that this was intrinsically a sighting issue. Both pilots were operating quite legitimately in the narrow confines of Class G airspace beneath the LTMA, where see and avoid prevails. Whereas the Jodel 150 pilot had stressed that he was cognisant of the busy traffic scenario and was maintaining a careful scan for other ac, a member postulated that his attention might naturally have been drawn to any traffic in the circuit at Elstree off to starboard. Unfortunately, the other ac was approaching unseen from the port side. This Airprox illustrated clearly the difficulties of sighting a small helicopter in a mock camouflage colour-scheme of very small cross sectional area, closing on a steady relative bearing with no crossing motion to draw attention to its presence, despite a disciplined lookout and the two HISLs fitted to the Hughes H369. Providentially, the Jodel pilot did manage to spot it, just in time at minimal range in his 10 o'clock - about 100m away he reported – which enabled him to push forward and take avoiding action. This was clearly less than ideal and the Members agreed that a very late sighting by the Jodel D150 pilot was part of the cause.

Commercial helicopter pilot Members were concerned that the H369 pilot had elected to press-on into a low setting sun and whilst his route to his destination took him that way, it might have been wiser to have purposefully introduced a dogleg into his route so as to enable him to see where he was going more clearly. A GA Member wondered if this was a practical thing to do, however, good airmanship would naturally dictate this should be considered when weighing up the risk of encountering another ac. This Airprox was a salutary lesson of the unseen dangers existing in good weather when flying 'into sun'. Moreover, in this instance the H369 pilot was responsible for sighting the other ac and 'giving way' under the 'Rules of the Air'. But 'the Rules' can only work if the other ac is seen in time to take positive action when necessary. Here, the H369 pilot reports he only saw the Jodel as it was already passing immediately below his helicopter. Furthermore, it was evident that this Airprox occurred as the H369 pilot was changing his SSR code – another distraction that can be time

consuming. A pilot Member noted that it could take about 7sec to change a code setting, which is a long time to have eyes in the cockpit. A technique he uses is to change two numbers – before taking a scan outside the cockpit – and then changing the last two numbers. However, here the helicopter pilot was unable to take any action whatsoever to forestall this close quarters situation and the Board agreed that this was effectively, a non-sighting by the Hughes H369 pilot and the other part of the cause.

In this instance the Jodel D150 pilot attempted to avoid the Hughes helicopter by diving below it. His reasoning - to keep the other ac in sight - was sound, but the resultant separation was apparently minimal. As Mode C was not fitted to the Jodel, the absence of comparable altitude data made accurate independent assessment of the vertical separation that pertained here impossible. The Jodel pilot had reported transiting in a level cruise at 1400ft QNH (1026mb); whereas the H369 was indicating 1500ft London QNH (1024mb) moments before the tracks crossed. This suggested 160ft of theoretical separation existed, but given the applicable tolerances of Mode C [+/-200ft on *verified* data] this was clearly minimal. There was no reason to doubt the veracity of the reports provided – 15-20ft reported by the helicopter pilot and 30-50ft from the Jodel pilot's account - who was probably better placed to judge the distance anyway. Whether the Jodel pilot had sufficient time to physically move his aeroplane out of the way to avert a collision was debateable, but the radar data had shown the tracks had crossed exactly which corroborated the pilots' reports. Therefore, with at most 50ft reported between them and one of the pilots unable to react because the Jodel was not seen until it was already passing immediately below his helicopter, Members agreed unanimously that an actual risk of a collision had existed in the circumstances conscientiously reported here.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: An effective non-sighting by the Hughes H369 pilot and a very late sighting by the Jodel D150 pilot.

Degree of Risk: A.