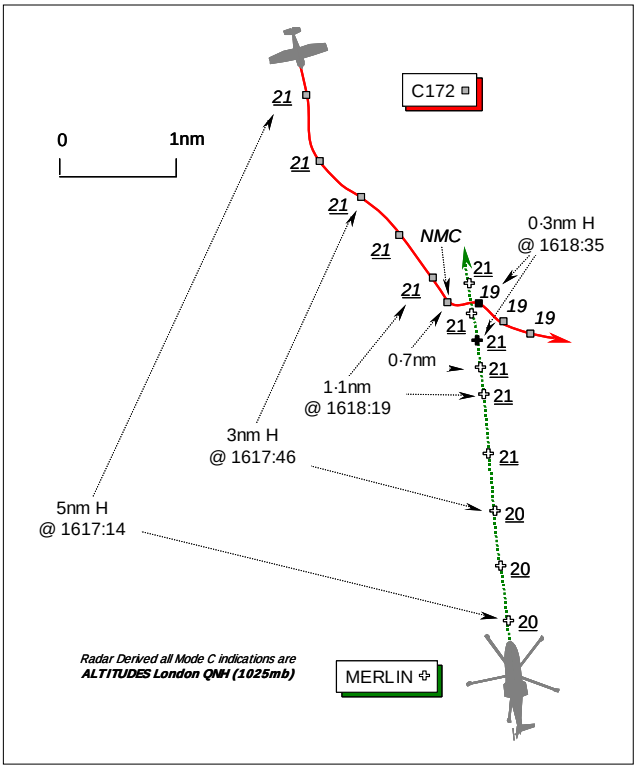
AIRPROX REPORT No 2010030

Date/Time:	12 April 2010 (Monday) 1618Z	
Position:	5146N 00114W (11nm NNW of Benson A/D - elev 203ft)	
Airspace:	Oxford AIAA	(*Class:* G)
	Reporting Ac	*Reported Ac*
Type:	Merlin HC3	C172
Operator:	HQ JHC	Civ Pte
Alt/FL:	1900ft QFE (1017mb)	2000ft (NK)
Weather:	VMC In Haze	VMC CAVOK
Visibility:	3000m	10km
Reported Separation:	100ft V/nil H	200ft V/¼nm H
Recorded Separation:	200ft V	



PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

THE MERLIN HC3 CAPTAIN, a QHI, reports that on completion of a training sortie in North Wales the crew were carrying out a routine IF recovery at Benson in VMC. As the ac captain and QHI he occupied the centre seat with trainee pilots in both L and R seats; the RH seat occupant was the PF on instruments.

Whilst under a TS from Benson APPROACH (APP) on 376·65MHz, they were in receipt of radar vectors for an ILS approach to RW19 at 1900ft Benson QFE (1017mb). The allocated squawk of A3672 was selected with Mode C on; neither TCAS nor any form of CWS is fitted. The crew were operating in haze, which reduced slant visibility; however, they were flying well clear of cloud.

Approaching a position 10nm NNW of the A/D – to the NE of Oxford – on a vector of 360° at 120kt to position for the ILS, the RH seat PF sighted another ac as it emerged from directly beneath their helicopter and cleared into their 2 o'clock. From the centre seat the Captain also spotted the other ac at the same time through the front-right chin window. The white single-engine C172 high-wing monoplane had passed an estimated 100ft below his Merlin with a 'high' risk of collision before heading away on an easterly track. There was no time for evasion, but if the C172 had been seen earlier, avoiding action would definitely have been taken. At this point both ac were flying straight and level. The pilot of the other ac took no avoiding action, he thought. No other traffic had been reported in the vicinity by ATC who were immediately informed about the other ac, but the controller stated that no other squawks were observed. The instrument recovery was continued without further incident.

On landing he managed to contact the C172 pilot, who stated that he would never routinely contact Benson ATC.

The captain perceived the flight safety risk as high; although there was some vertical separation, a collision was avoided purely by chance. The incident highlighted the lack of primary radar cover at Benson and the need to maintain an effective lookout at all times when receiving a radar service.

The helicopter has a green camouflage scheme but the white upper & lower HISLs were on.

THE C172 PILOT reports that after take-off from RW01 at Oxford/Kidlington he departed downwind VFR to begin his flight detail under a BS from Oxford APP on 125·325MHz. A squawk of A7000 was selected on, with Mode C.

He was advised by APP that there was no traffic on frequency to affect his flight SE of the airport and he took up a heading of about 120° at 110kt to follow the A40 Oxford Ring Road toward Headington, climbing to an altitude of 2000ft Oxford QNH in CAVOK conditions. About 3½nm SE of Oxford Airport, as he levelled out and was in the process of trimming his ac, the Merlin helicopter was spotted about 1nm away in the right forward quadrant, at an approximate angle of 50°, in close proximity. The helicopter was at almost the same altitude, but he estimated slightly above and it was immediately apparent that his aeroplane had not been seen by the Merlin's crew. A rapid descent to the left was initiated to avoid a collision with the helicopter, which passed 200ft above and ¼nm away to starboard with a 'medium' risk of a collision as he descended to 1500ft ALT. The descent was stopped when visual contact was gained with the Merlin in his rear left quadrant, at this point, well clear above his aeroplane.

UKAB Note (1): In a subsequent telephone conversation with UKAB Staff, the C172 pilot confirmed that a week after the Airprox occurred a fault was confirmed within his ac's SSR transponder. This was subsequently rectified with a replacement unit.

THE BENSON APPROACH CONTROLLER (APP) reports that a formation of 2 Merlin helicopters was recovering to Benson for individual instrument approaches following a radar handover from Brize Norton. He was operating with SSR only to RW01RH. The lead helicopter crew wanted an ILS approach, against the stream, to RW19 and the No2 crew wanted a PAR to RW01RH. After the formation split, the No2 was vectored S for RW01RH, whilst the lead Merlin was vectored to the N, his intention being to delay the lead Merlin with a racetrack circuit while the No2 completed his approach and the PAR was swung [to monitor the ILS approach]. Both ac were turned eastwards, the No2 onto base leg and the lead [subject] Merlin for delay. Then the lead Merlin pilot reported that he had just passed very close to a civilian Cessna, about 100m away and about 100ft below. The pilot was informed that there was no contact on radar. He did not say at that point that he wanted to file an Airprox; it was only a few hours afterwards when the aircraft captain telephoned ATC to discuss the incident that he said he would be filing an Airprox.

THE OXFORD COMBINED AERODROME/PROCEDURAL APPROACH CONTROLLER, who is not equipped with radar, provided a short report stating that: no comment was made by the C172 pilot about any incident with another ac during his departure or before switching to Farnborough LARS at 1625.

HQ AIR CMD ATM SAFETY MANAGEMENT reports that the Airprox occurred in Class G airspace within the Oxfordshire Area of Intense Aerial Activity (AIAA). The Merlin crew was under a TS from Benson APP on 376·650 MHz; however, only a reduced service [previously termed a limited service] was provided using SSR only (data supplied by the Brize Norton SSR head), because of the un-serviceability of the Benson Watchman ASR. APP reports operating under a low workload with only 2 ac under control. The Merlin was initially the lead ac of a pair that had been split for individual approaches. The subject helicopter was being vectored NW of Benson for an ILS to RW19, while the other Merlin was vectored to the SW for a PAR to RW01RH, which was the duty RW. Consequently APP was working with a wide geographical split.

The APP RT transcript shows one traffic call made at 1615:31, which was to another ac not involved in the Airprox. The remainder of the transmissions were exclusively connected to the vectoring of ac and none included TI. The radar recording shows the Merlin transiting N, as vectored by APP for the ILS, with another contact transiting SE from Oxford Kidlington squawking A7000 and indicating an altitude of 2100ft London QNH (1025mb). At 1618:45 the Merlin crew reported, "[C/S] *we just came very close to a civilian Cessna approximately a hundred metres at about a hundred feet below us and he's going away at our 4 o'clock*". APP replied, "[C/S] *roger no contact on radar*"; the controller reaffirmed in his written account that there was no contact on radar. The radar recording utilises a

different source to that of the Brize Norton MSSR, which was the source of the SSR data displayed to the controller at Benson.

APP was quiet and had separated the Merlin formation for vectors to different runways under a limited radar service, without the Watchman ASR that was unserviceable. APP did not see the confliction arising and no TI was passed to the Merlin crew. The geographical split of the traffic under service meant the controller's scan was spread over a wide area, however, at the time he reported no other contact on radar. With the ASR out-of-service, coupled with the apparent lack of SSR contact on the C172 on the Benson display, the controller was unable to provide adequate TI to the Merlin crew about the confliction. Since this Airprox, Benson has regained full use of the Watchman primary ASR.

ATSI reports that the Airprox occurred in Class G airspace 5nm SE of Oxford Airport. The C172 was operating on a VFR flight and in receipt of an ATS from Oxford ATC. The Oxford controller was providing a combined Aerodrome and Approach Control service, without the aid of surveillance radar equipment.

The C172 departed from RW01 at 1614 and at 1615:40 the pilot and Oxford controller agreed the provision of a BS. At 1615:42, the Clee Hill radar recording shows a radar return ½nm NE of Oxford Airport tracking SE. The radar return from this transponder is intermittent and alternates between a squawk of A0000 with no Mode C indicated and a squawk of A7000 with Mode C. At 1618:38, the radar recording shows this contact, 5nm SE of Oxford, southbound, squawking A7000, indicating 1900ft Mode C reported altitude.

Oxford APP did not receive any reports from the pilot of the C172 regarding the close proximity of another ac and at 1625:07, the pilot advised switching en-route to Farnborough on 125·250MHz.

The Oxford controller was not aware of the conflicting traffic and MATS Pt1, Section 11, Page 4, Para 3.1.1 states:

> A Basic Service is an ATS provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights. This may include weather information, changes of serviceability of facilities, conditions at aerodromes, general airspace activity information, and any other information likely to affect safety. The avoidance of other traffic is solely the pilot's responsibility.

UKAB Note (2): The Clee Hill Radar recording shows the Merlin as a good primary contact, identified from its A3617 squawk, northbound maintaining a level cruise at 2000ft Mode C London QNH (1025mb). The C172 – shown only as a secondary return about 90% of the time with no supporting primary – is squawking A7000 and indicating 2100ft London QNH unverified Mode C, in the helicopter's 11 o'clock at a range of 5nm. The ac close to 3nm and thereafter the Merlin maintains an indicated 2100ft QNH on a steady course. The C172 flies a generally SSE'ly course to a range of 1·1nm from the Merlin at 1618:19, at the same altitude. On the next sweep when the ac had closed to 0·7nm, A0000 (SSR data unreliable) is shown by the C172 with NMC, coupled thereafter with a sharp L turn, which is indicative of the C172 pilot's reported avoiding action L turn. The descent is confirmed on the successive return at 1618:35, where the C172 indicates 1900ft QNH, some 200ft below the Merlin, just as the aeroplane has crossed ahead of the helicopter at the CPA directly over the A40 dual-carriageway. However, the horizontal separation of 0·3nm based on the SSR return of the C172 may be questionable as the C172's course is somewhat erratic and may be subject to 'track jitter'. The C172 clears to starboard of the Merlin, which on a steady track passed 0·3nm astern of the C172 as the range increased.

Neither of the Heathrow Radar heads detected the C172's SSR, but they did pick up the primary contact from over 30nm away.

HQ JHC comments that the C172 was under a BS and therefore responsible for separation, which ultimately he maintained by taking avoiding action. The Merlin was under a TS and would therefore expect to be passed information on conflicting traffic. As the C172 did not appear on Bensons SSR and the primary radar was U/S, ATC were unable to report on it. The Class G Oxford AIAA airspace is particularly busy and often has non-transponding ac. Whilst ATC were unable to pass information on the unseen ac, the Merlin crew may have reasonably been expected to see the C172 operating at the same height, despite the reduced slant visibility. Being on the same frequency might have added to the situational awareness of both ac, increasing the likelihood of seeing each other. JHC crews will be reminded of the need for particularly good lookout within the Oxford AIAA, especially when the primary radar is U/S.

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 and operating authorities.

It was plain to the Board, from the Merlin Captain's commendably frank account, that none of the three pilots aboard his helicopter had seen the C172 closing on a steady relative bearing in the prevailing haze before the aeroplane was spotted clearing to starboard. There was no time for evasion, so this was, effectively, a non-sighting on their part and the confliction had passed by the time they saw the reported ac. The Board noted that the Merlin crew were in receipt of a 'reduced' TS and a civilian pilot Member questioned whether the crew would have been advised of this caveat or aware of the significance of it. Whilst the RT transcript provided did not encompass the period when notification of this reduced radar service might have been transmitted to the crew, a military controller Member advised the Board that it was SOP for controllers to include the word 'reduced' whenever appropriate in advising crews about the level of service being provided. The MAA Advisor explained to the Board that the ASR had been a long-term unserviceability at the Merlin's base that had been NOTAM'd and thus the crew should have been aware of the nature of this limitation. However, there were periods when Benson ATCOs had deployed to Brize Norton to provide a radar service to Benson aircraft in an attempt to mitigate the loss of Benson's primary ASR; therefore it was not always the case that crews would receive a reduced service during the period of the NOTAM. On balance, the Board accepted that while there was some scope for crews to be confused about the exact nature of the service they were receiving, in this Airprox the Merlin Captain's report makes it clear that he fully understood the reason for the reduced TS provided.

The Board noted that installation of a mobile ASR had been planned but the situation had been resolved prior to the installation of portable equipment. Nevertheless, Members were of the view that this Airprox highlighted the importance of provisioning back-up equipment at the earliest opportunity to Units that operate in a high-density Class G environment where non-transponding traffic will routinely be encountered.

It was evident from the C172 pilot's account that he was squawking the SSR conspicuity code, which should have made the aeroplane evident on the Benson APP controller's 'secondary only' display. The C172 shows plainly on the recording of the Clee Hill Radar source over 50nm away, but the Board was aware that this did not necessarily replicate what was displayed to Benson APP at the time. Members recognised that the SSR data provided to Benson was from the Brize Norton head, which nonetheless should still have readily detected the C172 at an altitude of 2000ft as it passed within a range of 15nm. However, it was evident that the C172's SSR was only apparent about 90% of the time and occasionally displayed A0000 – data unreliable. The Board therefore acknowledged the Command's view that the C172's SSR contact was absent from the Benson controller's display. Moreover, it was subsequently confirmed that the C172' SSR transponder had proved faulty, which was indicative of why the controller was unable to provide any TI about the C172 to the Merlin crew beforehand.

The C172 pilot lacked any radar assistance from Oxford APP, which is not provisioned with such equipment. It had been suggested that he should have called Benson but there was no compunction on him to do so and he later switched directly to Farnborough - the nominated LARS unit to the E. Nevertheless, in the GA Member's view it would have been worthwhile if the C172 pilot had called Benson ATC to advise of his transit adjacent to their instrument approach pattern and a general warning might well have ensued before he free-called Farnborough. From the C172 pilot's perspective, he had sighted the Merlin ahead at a range of about 1nm away and, in a pilot Member's opinion, in good time. The radar recording illustrated both ac were at the same level at about this point but the C172 pilot's avoiding action turn to the L was executed just after horizontal separation had reduced to 0·7nm. This L turn surprised some pilot Members as it took the aeroplane across the nose of the Merlin but as the C172 pilot was following the A40 – presumably in compliance with the right-hand traffic rule – it might be that from his perspective at these close quarters this was the safer option. Notwithstanding any reservations over the accuracy of the C172's indicated unverified Mode C readout because of the unserviceability reported later, a descent of 200ft was apparent and in-line with the C172 pilot's visual estimate of the vertical separation that pertained, who was better placed to judge the vertical separation here. As it was the radar recording showed that the C172 passed about 0·3nm ahead and 200ft below the Merlin. Therefore, the Members concluded unanimously that this Airprox had resulted from a conflict in the Oxford AIAA resolved by the C172 pilot. Moreover, in the Board's view the C172 pilot's avoiding action was effective and had ensured that there was no risk of a collision.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: Conflict in the Oxford AIAA resolved by the C172 pilot.

Degree of Risk: C.