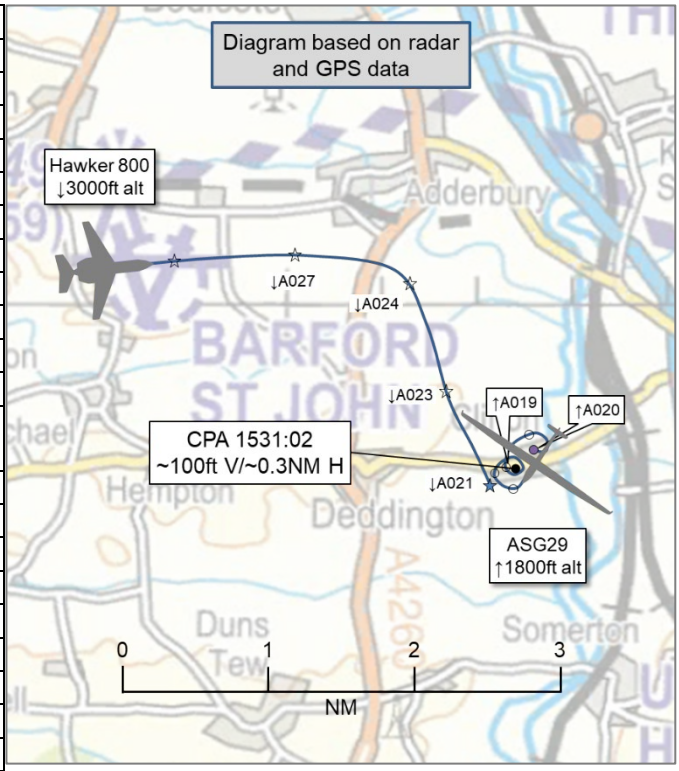
AIRPROX REPORT No 2022030

Date: 14 Mar 2022 Time: 1531Z Position: 5159N 00118W Location: 3NM NW of Upper Heyford

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Hawker 800	ASG29
Operator	Civ Comm	Civ Gld
Airspace	London FIR	London FIR
Class	G	G
Rules	IFR	VFR
Service	Traffic	None
Provider	Oxford Radar	N/A
Altitude/FL	2100ft	2000ft
Transponder	A, C, S+	Not fitted
Reported		
Colours	White, grey	White
Lighting	Nav, beacon, taxi, strobes	None
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	1800ft	1700ft
Altimeter	QNH (1023hPa)	QFE (NK hPa)
Heading	170°	'SE'
Speed	150kt	70kt
ACAS/TAS	TCAS II	PowerFLARM
Alert	None	None
Separation at CPA		
Reported	0ft V/100-200m H	Not Seen
Recorded	~100ft V/~0.3NM H[1]	



THE HAWKER 800 PILOT reports that, while being radar vectored onto final approach for ILS RW19, at approximately 7 miles from touchdown and on the extended centreline, they passed abeam a glider at the same height and within approximately 100-200m. The glider gave no indication on their TCAS and ATC had relayed no warning of gliders in the area. The airspace and frequency were busy and the aircraft was flown accordingly at a slow intercept speed of 150-160kt. It was only when passing abeam the glider that it was spotted.

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

THE ASG29 PILOT reports that they have no recollection of the incident. Whilst lookout is obviously the primary means of collision avoidance, they [glider pilots] are increasingly using electronic conspicuity and for that reason they are particularly interested in the details of this incident. The flight in question was the first one after updating their [EC equipment] to [a more capable version] with ADSB-in; they are therefore interested to know how close the other pilot perceived the incident to be given that they don't recall the incident or receiving any warning. They have looked on FlightRadar24 and can see a Hawker 800 in the vicinity but interestingly cannot see their own aircraft.

THE OXFORD RADAR TRAINEE CONTROLLER reports that, at the time, three jets were being vectored for RW19, the [Hawker 800] being the first of the three. There was quite a bit of input from the OJTI as the FIR was very busy with both transponding and non-transponding traffic and they were both looking for the best routing for all three jets. At the time the [Hawker 800] was on base and had been passed their closing heading for the ILS; no traffic was observed on the final approach and nothing had been reported by previous inbound aircraft.

[1] CPA derived from a comparison of radar data for the Hawker 800 and GPS data for the ASG29.

THE OXFORD RADAR INSTRUCTOR CONTROLLER reports that they were the OJTI in APP/APS of a post-level 2 (100+ hours trainee). From memory, the traffic levels were medium-to-high at the time and they were providing a radar service to several aircraft. There was a sequence of at least three jet arrivals, the first of which was the [Hawker 800]. There were some primary-only returns on the radar display (north of Oxford airport by approximately 10-15 miles) and lots of 7000 squawks and aircraft under a Basic Service working Oxford, as well as other background tracks. They recall that they and the trainee were working to find gaps to vector [the Hawker 800] and the other arrivals inbound. The [Hawker 800] was brought onto a base leg and descended, and subsequently given a closing heading to establish on the localiser. No conflicting aircraft or primary returns were observed and, therefore, once the aircraft was established [on the localiser] it was passed to the Tower frequency. Their attention was then taken to the next arrivals that were inbound from the north and southwest.

Factual Background

The weather at Oxford Airport was recorded as follows:

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METAR EGTK 141520Z 23009KT 9999 FEW047 12/04 Q1023=
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Analysis and Investigation

Oxford ATC Investigation

Oxford Radar had co-ordinated an inbound level of 6000ft routing towards the OX, TC specifying that the aircraft was released to Oxford on leaving controlled airspace (following this, the TC controller called Oxford back to co-ordinate that the [Hawker 800] had been transferred on a heading but was released for turns on contact). The crew of [the Hawker 800] first made contact with Oxford Radar at time **15:19** and the following RTF exchanges occurred:

15:19: [Hawker 800 c/s]: *Oxford, hello, [Hawker 800 c/s] is with you, descending six thousand feet, One-Zero-Two-Four, on heading two-seven-five with information Kilo.*

Radar did not initially reply to this transmission, instead passing Traffic Information to other aircraft under their control. At **15:20** a transmission is heard saying, "*hello ma'am*" which may have been the [Hawker 800] crew but this is unverified.

15:20: [Hawker 800 c/s]: *Oxford, [Hawker 800 c/s]*?
15:20: OXF RAD: *[Hawker 800 c/s], Oxford radar, Q-N-H one-zero-two-four, expect vectors for the I-L-S approach runway one-niner*.
15:20: [Hawker 800 c/s]: *one-zero-two-four, vectors I-L-S runway one-nine, [Hawker 800 c/s]*.

At time **15:21** the [Hawker 800] is seen to leave controlled airspace by descent.

15:23: OXF RAD: *[Hawker 800 c/s], fly heading three-four-zero degrees*.
15:24: [Hawker 800 c/s]: *Heading three-four-zero degrees, [Hawker 800 c/s].*
15:24: OXF RAD: *[Hawker 800 c/s], identified, traffic service*.
15:24: [Hawker 800 c/s]: *Traffic Service, [Hawker 800 c/s].*
15:25: OXF RAD: *[Hawker 800 c/s], descend to altitude five-thousand feet*.
15:25: [Hawker 800 c/s]: *Descend altitude five-thousand feet, [Hawker 800 c/s]*.
1526: OXF RAD: *[Hawker 800 c/s], traffic right, one o'clock, three miles, northwest-bound at three-thousand feet, a D-A-Forty, further traffic, in your twelve o'clock, five miles, south-eastbound indicating two-thousand-six-hundred feet.*
1527: [Hawker 800 c/s]: *Traffic copied, [Hawker 800 c/s].*
1527: OXF RAD: *[Hawker 800 c/s] turn right heading three-six-zero degrees.*
1527: [Hawker 800 c/s]: *Right, three-six-zero degrees, [Hawker 800 c/s].*
15:28: OXF RAD: *[Hawker 800 c/s],turn right heading zero-six-zero degrees, descend to altitude three-thousand feet, two-zero miles from touchdown*.
15:28: [Hawker 800 c/s]: *Right, zero-six-zero degrees, descend to three-thousand feet, [Hawker 800 c/s]*.

15:29: OXF RAD: *[Hawker 800 c/s], turn right heading zero-nine-zero degrees, base leg*.
15:29: [Hawker 800 c/s]: *Right zero-nine-zero, base leg, [Hawker 800 c/s]*.
15:30: OXF RAD: *[Hawker 800 c/s], descend to altitude one-thousand-eight-hundred feet, one-two miles from touchdown*.
15:30: [Hawker 800 c/s]: *Descend altitude one-thousand eight-hundred feet, [Hawker 800 c/s]*.
15:30: OXF RAD: *[Hawker 800 c/s] turn right heading one-six-zero degrees, cleared I-L-S approach runway one-niner*.
15:30: [Hawker 800 c/s]: *Right one-six-zero degrees, cleared the I-L-S, runway one-nine, [Hawker 800 c/s]*.
15:32: OXF RAD: *[Hawker 800 c/s], contact Tower, one-three-three decimal four-three-zero*.
15:32: [Hawker 800 c/s]: *One-three-three decimal four-three-zero, [Hawker 800 c/s].*

After landing and being given instructions to vacate the runway, the crew of [the Hawker 800] informed the Tower of the following:

15:36: [Hawker 800 c/s]: *And [Hawker 800 c/s], we had a close call with a glider, at seven miles on the extended centreline*.
1536: OXF TWR: *Roger I'll let radar know*.
15:36: [Hawker 800 c/s]: *Yeah it wasn't on TCAS there was no altitude*.
15:36: OXF TWR: *Yeah I suspect it wasn't even showing on radar either*.

At **15:36** the Oxford Tower controller relayed to the Oxford Radar controller, "*There's a glider somewhere on a seven mile final apparently*".

"*Ok, 18 miles on the [third inbound aircraft]*" ([the second inbound aircraft] was already on a 6 mile final at this point). Traffic Information was passed to the next inbound [c/s redacted] (by the OJTI) as "*[c/s redacted] there's been intermittent erm primary contact coming up on your left hand side abeam eight miles, your closing heading should take you south of that, there have been gliders reported, keep a good lookout.*" (**15:39**) which was acknowledged by the crew of [the third inbound aircraft].

Analysis

At the time of this Airprox, Oxford Radar was operating with an experienced OJTI mentoring a radar trainee with in excess of 100 training hours. Traffic levels were moderate-to-heavy but there was an added complexity of a busy FIR, showing numerous background/unknown contacts. The position at the time was operating without the aid of RAD2, but the position was available should the controller have felt it needed to be utilised.

[The Hawker 800] was operating outside controlled airspace in receipt of a Traffic Service from Oxford Radar. The service provided to the [Hawker 800 pilot] was not reduced, however, there is evidence from reviewing this event that other aircraft in the vicinity did have their radar service reduced owing to controller workload ([a DA40 pilot] was given reduced Traffic Information at **15:31** owing to controller workload). Likewise, at **15:22** [a C182 pilot] was refused a training ILS approach owing to controller workload, evidencing the controller was actively taking steps to keep their workload under control and reserve capacity for vectoring the jet arrivals.

Based on the report received, it is understood that this Airprox occurred on an approximately 7 mile final to Oxford's RW19. Therefore, the Airprox is believed to have occurred at approximately **15:30**. Whilst the radar trainee was transmitting a closing heading to [the Hawker 800 pilot], a primary contact can be observed operating just east of the final approach track, but this faded whilst the transmission is being made (see Figure 1).

Figure 1 – Closing Heading & Primary Contact

Owing to the sporadic nature of the return, it would be reasonable for the controller to dismiss this as clutter. Given the information available to Oxford, it also cannot be confirmed that this was the glider involved in this Airprox or was a true return of any aircraft for that matter. As noted in the initial review, a further primary contact was observed whilst the [Hawker 800] was turning and establishing on its closing heading (see Figure 2).

Figure 2 – Closing Heading & Primary Contact 2

Again, given the information available to Oxford it cannot be confirmed whether this was a true return from an aircraft or, if so, if this was the glider involved in the Airprox. There were no radar contacts observed in the vicinity when the aircraft was transferred from Radar to the Tower controller at time **15:32** (aircraft on a six mile file at this point).

On review of the radar replay, in the period preceding the Airprox there were various contacts observed in the vicinity of the final approach track. The most consistent of these was observed approaching the final approach track from the west, tracking eastbound. The contact was flying on a consistent track eastbound but this contact faded at time **15:29** whilst west abeam an eight mile final (see Figures 3 and 4). Owing to the limited resources available, this again cannot be verified as the aircraft to which this Airprox relates.

Figure 3 – Unknown Contact

Figure 4 – Unknown Contact Faded

At the time of the Airprox, [the Hawker 800 pilot] was in receipt of a Traffic Service from Oxford Radar. With this service, the CAP774 states that "*The controller shall pass traffic information on relevant traffic, and shall update the traffic information if it continues to constitute a definite hazard, or if requested by the pilot*". This requirement could not realistically be achieved as the radar return that related to the unknown glider in this incident was difficult to identify, even with the benefit of hindsight. The returns that do appear surrounding the estimated time of the Airprox are likewise so sporadic they could easily be missed or, if seen, dismissed as radar clutter.

As stated previously, the radar task was being executed without the aid of RAD2. In interview, it was asked of both the OJTI and trainee whether it would have been considered necessary to 'split' the position owing to the workload generated by IFR inbounds (at the time of the Airprox 3 jets were being vectored inbound, [the Hawker 800] being the first followed by a [Cessna Citation] and then a [Global Express]). It was specified that, at the time of taking over the position, the upcoming traffic levels were looked at and it appeared as though the jet arrivals were 'spread out' and therefore manageable without the aid of a second radar control position. The radar OJTI specified in their training report that discussions surrounding splitting the frequencies took place but that this wasn't required. It was also asked at interview how much OJTI input took place during this training session, both the OJTI and trainee specifying that a lot of OJTI input was needed, the OJTI passing the trainee instructions on routings etc. to take, in order to effectively sequence the inbounds. That said, the trainee maintained issuing control instructions via RT with only a few interjections on the RT by the OJTI.

After landing, a report from the crew of [the Hawker 800] relayed to the Tower controller that they had had "*a close call with a glider, at seven miles on the extended centreline*" (note: no mention of an Airprox was reported at this time). The report was acknowledged by the Oxford Tower controller, relayed to the radar controller and this information was relayed, where able, to subsequent arrivals by the Oxford Radar controller. The OJTI took control of the RT to relay to an inbound Global Express, "*[Global Express c/s] there's been intermittent erm primary contact coming up on your left-hand side abeam eight miles, your closing heading should take you south of that, there have been gliders reported, keep a good look out*".

Conclusion

At approximately **15:30** on Monday 14th March, 2022 an Airprox occurred between [a Hawker 800] and an unknown glider. [The Hawker 800 pilot] was in receipt of a Traffic Service from Oxford Radar whilst inbound to land at Oxford. The glider either wasn't showing on the controller's radar display or returns were so intermittent that they were disregarded as clutter and, therefore, Traffic Information was not passed. The unknown glider was not in radio contact with Oxford and it is not known whether the pilot was in receipt of a service from another provider.

UKAB Secretariat

The Hawker 800 and ASG29 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.[2] If the incident geometry is considered as converging then the Hawker 800 pilot was required to give way to the ASG29.[3] If the incident geometry is considered as overtaking then the ASG29 pilot had right of way and the Hawker 800 pilot was required to keep out of the way of the other aircraft by altering course to the right.[4]

[2] (UK) SERA.3205 Proximity.
[3] (UK) SERA.3210 Right-of-way (c)(2) Converging.
[4] (UK) SERA.3210 Right-of-way (c)(3) Overtaking.

Comments

BGA

Pilots flying near, but not using, Instrument Approach Procedures (IAPs) in Class G airspace are strongly advised to contact the relevant ATSU, to make controllers aware of their presence. Unfortunately pilot workload, lack of knowledge about the precise location of IAP flight paths and/or not holding the required Flight Radio Telephony Operator's Licence (FRTOL) may militate against doing so. Although the exact tracks followed by IAP traffic are published on a per-airfield basis, it is difficult and time-consuming for non-participating pilots to correlate this with their potential cross-country routes. The Board has previously recommended publication of consolidated data on the location of all IAP flight paths in Class G airspace (Ref Airprox 2014097, 2014126). This could best be provided as a data file that pilots could load into their moving-map flight computers (aka Electronic Flight Bags), and would greatly assist non-participating pilots in avoiding IAP flight paths.

It's concerning that the glider's [EC equipment] apparently did not warn its pilot of the Hawker's proximity, based on the latter's ADS-B transmissions. It would be very helpful to understand why this safety barrier did not function.

Summary

An Airprox was reported when a Hawker 800 and an ASG29 flew into proximity 3NM northwest of Upper Heyford at 1531Z on Monday 14th March 2022. The Hawker 800 pilot was operating under IFR in VMC and in receipt of a Traffic Service from Oxford Radar; the ASG29 pilot was operating under VFR in VMC and not in receipt of an Air Traffic Service.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, radar photographs/video recordings, reports from the air traffic controllers involved and a report from the appropriate operating authority. Relevant contributory factors mentioned during the Board's discussions are highlighted within the text in bold, with the numbers referring to the Contributory Factors table displayed in Part C.

The Board first considered the actions of the Hawker 800 pilot and heard from a commercial pilot member that this can be a busy area with a lot of GA traffic and so members considered that the Hawker 800 pilot may have been better served in requesting a Deconfliction Service. That said, the Board also noted that the ASG29 had not been fitted with a transponder so, in this case, a higher level of ATS may not have assisted the pilot in detecting the glider. The Board agreed that, as it was, the Hawker 800's TCAS II could not have detected the non-transponding glider (**CF6**) and the controller had not passed Traffic Information on the fleeting primary contact, so the Hawker 800 pilot had not had any situational awareness of the presence of the ASG29 (**CF5**). This had left the Hawker 800 pilot relying on their lookout for the detection of potential threats to their aircraft, and the Board agreed that the Hawker 800 pilot had sighted the ASG29 too late to have been able to materially increase the separation between the 2 aircraft (**CF8**). The Board also wished to remind pilots to announce "Airprox" on the radio at the time of the event, if at all possible.

The Board then considered the actions of the ASG29 pilot and noted the recommendation that is printed on the CAA/NATS 1:500,000 VFR charts, namely '*Pilots are strongly recommended to contact aerodrome ATSU before flying within 10NM of any aerodrome marked with instrument approach feathers. Note that the feathers only align with the main instrument runway. There may also be approaches to other runways as well. Detailed IAP information is shown in the UK AIP*.' The Board heard from a glider pilot member that the BGA is encouraging – and facilitating through an intensive training program – pilots to gain their Flight Radiotelephony Operator's Licence (FRTOL), but there is a long-standing culture among glider pilots of not speaking to ATSUs because there is no regulatory requirement for them to do so. Furthermore, the member went on to say that there is no consolidated reference material that displays the locations and tracks for IAPs in Class G airspace. The Board recalled making a Safety Recommendation to the CAA in this regard (Airprox 2014097 and Airprox 2014126) but that this had been rejected on the basis that it would increase clutter on the VFR charts

and a separate chart depicting this information would necessarily be of a size or scale that would render it unusable. The Board accepted the rationale behind the CAA's rejection of the previous recommendation but members considered that, with the proliferation of electronic flight planning and navigation software, there is now an opportunity to make this information available in electronic format. Therefore, the Board resolved to recommend that '*The CAA facilitates the production of a consolidated data file, in a suitable electronic format, which permits the display of published Instrument Approach Procedures for aerodromes in Classes E, F and G airspace on moving map devices*'. Returning to the Airprox itself, the Board noted that the ASG29 pilot had been operating autonomously at around 2000ft some 8NM from Oxford aerodrome and had not contacted the Oxford controller (**CF4**). Therefore, there had not been the opportunity for the ASG29 pilot to have been warned of the presence of the Hawker 800 by the Oxford controller. Furthermore, members noted that the ASG29 pilot had been carrying EC equipment that should have been able to detect the transponder signals from the Hawker 800 but that they reported not having received any warning from this equipment (**CF7**). Consequently, the Board agreed that the ASG29 pilot had not had any situational awareness of the approaching Hawker 800 (**CF5**), leaving them with only their lookout for the detection of other aircraft. The Board also agreed that, in the event, the ASG29 pilot had not sighted the Hawker 800 and that this had been contributory to the Airprox (**CF8**).

Turning to the actions of the Oxford controller, the Board noted that traffic levels had been assessed as moderate-to-heavy with added complexity and that there had been a second radar controller available. Controller members felt that the decision as to whether or not to split the task across 2 controllers should not have rested with the in-place controller because the oversight and management of controller workload should be the responsibility of the Supervisor (or equivalent). Therefore, the Board agreed that the decision not to split the radar task between 2 controllers had been contributory to the Airprox (**CF1**). Members agreed that this had led to a busy controller trying to vector 3 aircraft through congested airspace either not noticing the intermittent primary contact generated by the ASG29 or dismissing it as clutter and, therefore, not having any situational awareness of the presence of the ASG29 (**CF3**) and thus not detecting the potential conflict between the Hawker 800 and the primary radar contact (**CF2**). The Board also discussed the potential use of other situational awareness tools – such as Flight Information Display Systems (FIDS) recently cleared for use (under certain circumstances) for AFISOs – and the Board was heartened to hear from a controller advisor that the CAA is actively pursuing how the use of FIDS might be expanded to include air traffic controllers.

Finally, the Board considered the risk involved in this event. Members noted that the Hawker 800 pilot had only seen the ASG29 as they passed abeam it and that the ASG29 pilot had never sighted the Hawker 800. Members were grateful to the ASG29 pilot for having supplied their GPS log file, as this had greatly enhanced their understanding of the geometry of the event and had enabled a CPA to be determined (albeit from different data sources). Although neither pilot had sighted the other aircraft in time to materially affect the separation, given the horizontal separation of approximately 0.3NM the Board agreed that, although safety had been degraded, there had been no risk of collision. Accordingly, the Board assigned a Risk Category C to this Airprox.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2022030			
CF	**Factor**	**Description**	**ECCAIRS Amplification**	**UKAB Amplification**
	Ground Elements			
	• Manning and Equipment			
1	Human Factors	• ATM Leadership and Supervision	An event related to the leadership and supervision of ATM activities.	
	• Situational Awareness and Action			
2	Human Factors	• Conflict Detection - Not Detected	An event involving Air Navigation Services conflict not being detected.	
3	Contextual	• Traffic Management Information Action	An event involving traffic management information actions	The ground element had only generic, late, no or inaccurate Situational Awareness

	Flight Elements			
	• Tactical Planning and Execution			
4	Human Factors	• Communications by Flight Crew with ANS	An event related to the communications between the flight crew and the air navigation service.	Pilot did not request appropriate ATS service or communicate with appropriate provider
	• Situational Awareness of the Conflicting Aircraft and Action			
5	Contextual	• Situational Awareness and Sensory Events	Events involving a flight crew's awareness and perception of situations	Pilot had no, late, inaccurate or only generic, Situational Awareness
	• Electronic Warning System Operation and Compliance			
6	Technical	• ACAS/TCAS System Failure	An event involving the system which provides information to determine aircraft position and is primarily independent of ground installations	Incompatible CWS equipment
7	Human Factors	• Response to Warning System	An event involving the incorrect response of flight crew following the operation of an aircraft warning system	CWS misinterpreted, not optimally actioned or CWS alert expected but none reported
	• See and Avoid			
8	Human Factors	• Monitoring of Other Aircraft	Events involving flight crew not fully monitoring another aircraft	Non-sighting or effectively a non-sighting by one or both pilots

Degree of Risk: C

Recommendation: The CAA facilitates the production of a consolidated data file, in a suitable electronic format, which permits the display of published Instrument Approach Procedures for aerodromes in Classes E, F and G airspace on moving map devices.

Safety Barrier Assessment[5]

In assessing the effectiveness of the safety barriers associated with this incident, the Board concluded that the key factors had been that:

Ground Elements:

Manning and Equipment were assessed as **partially effective** because, although the Oxford controller did not consider that the situation necessitated an additional controller in the RAD2 position, the increased workload of moderate-to-heavy traffic levels was recognised by the unit and therefore the decision to transfer some traffic to RAD2 could have been taken by unit management/supervision.

Situational Awareness of the Confliction and Action were assessed as **ineffective** because the intermittent nature of the ASG29 primary-only radar contact led to the controller not having any situational awareness of the presence of the ASG29 and therefore not detecting the conflict with the Hawker 800.

Flight Elements:

Tactical Planning and Execution was assessed as **partially effective** because the ASG29 pilot, operating in the vicinity of the Oxford instrument approach 'feathers', did not call the Oxford controller to inform them of their operating area.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because neither pilot had any situational awareness of the presence of the other aircraft.

Electronic Warning System Operation and Compliance were assessed as **ineffective** because the TCAS II equipment fitted to the Hawker 800 could not detect the non-transponding ASG29, and

[5] The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the UKAB Website.

the electronic conspicuity equipment on the ASG29 did not detect the Hawker 800's transponder emissions when it would have been expected to do so.

See and Avoid were assessed as **ineffective** because the Hawker 800 pilot did not sight the ASG29 in sufficient time to materially increase separation, and the ASG29 pilot did not see the Hawker 800.