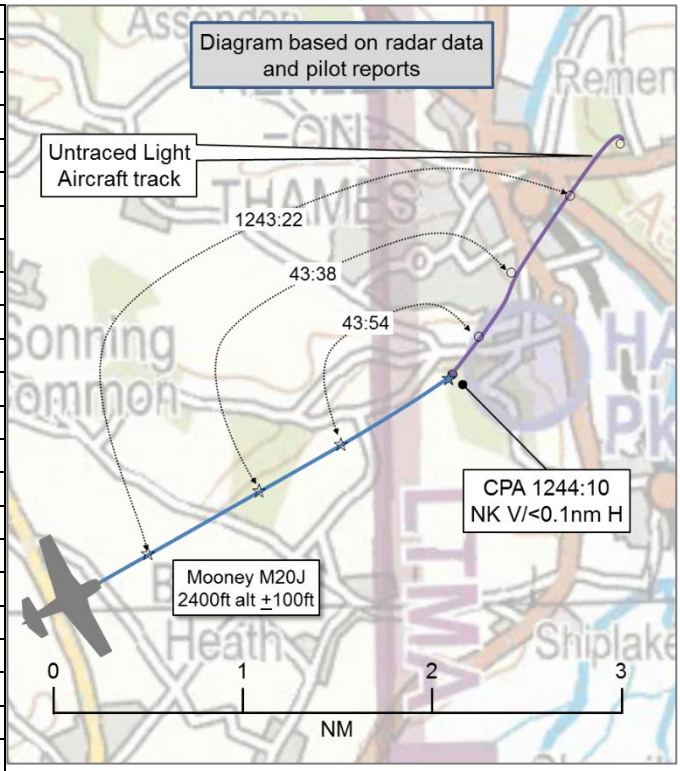
AIRPROX REPORT No 2019224

Date: 05 Aug 2019 Time: 1244Z Position: 5131N 00054W Location: 1nm S Henley-on-Thames

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Mooney M20J	Unknown
Operator	Civ FW	Unknown
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	
Service	Listening Out	Unknown
Provider	Farnborough	
Altitude/FL	FL024	
Transponder	A, C, S	
Reported		
Colours	Grey, Silver	White, Green
Lighting		
Conditions	VMC	
Visibility	>10nm	
Altitude/FL	2500ft	
Altimeter		
Heading	030°	
Speed	150kt	
ACAS/TAS	PilotAware	
Alert	None	
Separation		
Reported	0ft V/200m H	
Recorded	N/K V/<0.1nm H	



THE MOONEY PILOT reports that he was on a local VFR flight routing Oxford, west-abeam Benson and then overhead Reading before heading towards Henley. Whilst descending between Reading and Henley, he noticed the other aircraft directly ahead of him and in very close proximity. The aircraft appeared to be taking last-minute avoiding action as it abruptly turned to the left and went nose-up into a climb. The two aircraft came very close to each other. He took no action on sighting because the other aircraft was already moving out of conflict and he spotted it too late.

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

THE UNKNOWN LIGHT-AIRCRAFT: Enquiries were made at airfields close to the first and last recorded radar positions but the pilot could not be traced.

Factual Background

The weather at RAF Benson was recorded as follows:

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METAR EGUB 051220Z 24010KT 9999 FEW045 SCT060 22/11 Q1009 NOSIG
METAR EGUB 051250Z 25011KT 9999 SCT045 22/11 Q1009 NOSIG
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Analysis and Investigation

UKAB Secretariat

Radar replays show the Mooney and the unknown light-aircraft, the latter being a primary radar track only. The radar screenshot at Figure 1 is taken at 1243:18 and shows the Mooney (7000) to the south-west and the unknown light-aircraft (primary track only, no SSR) to the north-east. The unknown light-aircraft has just completed a turn onto a south-westerly heading.

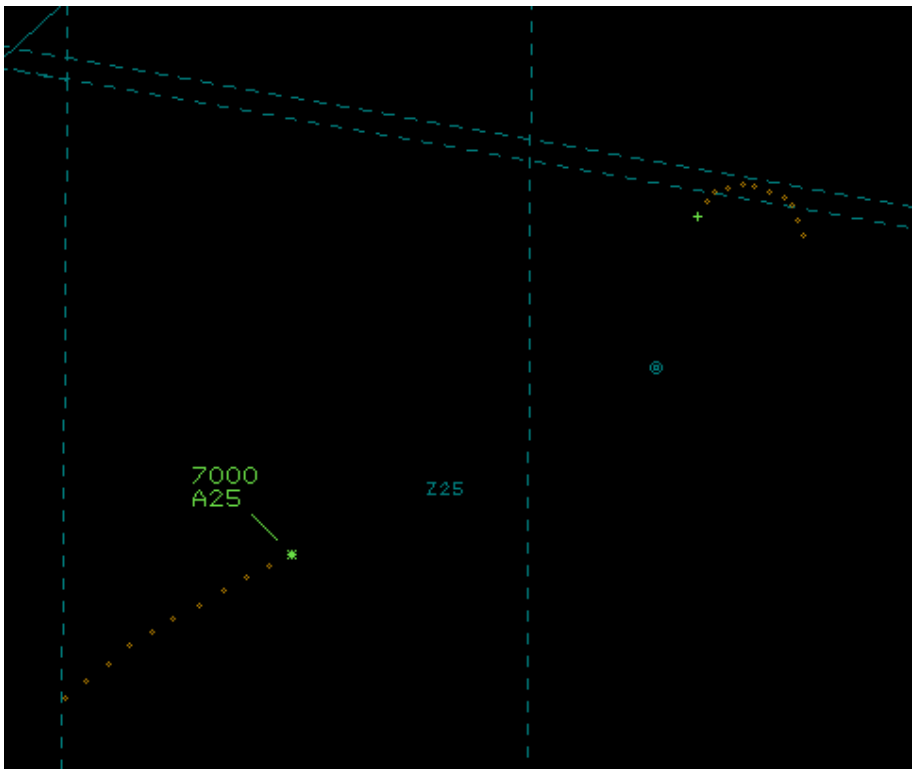


Figure 1 – 1243:18

In Figure 2, the Mooney has continued on its north-eastbound track and the unknown light-aircraft is now steady on a south-westerly track; the aircraft are separated by 1nm horizontally (vertical separation unknown).

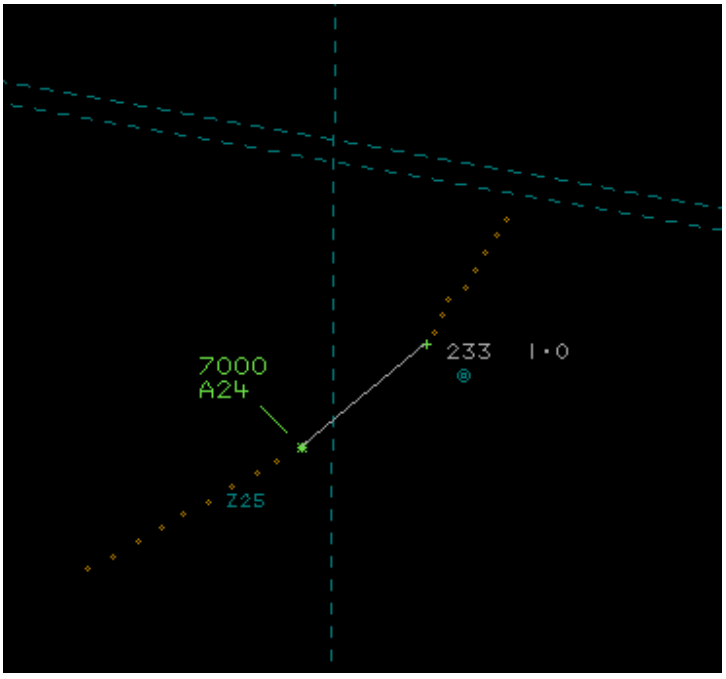


Figure 2 – 1243:54

Figure 3 shows the CPA between the 2 aircraft at the point at which the radar returns merge. There are no deviations in the Mooney's flight path detected on the radar. The radar track on the unknown light-aircraft indicates that its pilot may have commenced a gentle right turn immediately prior to CPA, but this deviation might also be due to radar jitter and the lack of a stable SSR return. Vertical separation cannot be measured due to the unavailability of height information for

the unknown light-aircraft but horizontal separation is <0.1nm (although 0.0 is indicated on the radar replay, radar resolution accuracy means that it is not possible to conclusively state separation to that level of accuracy).

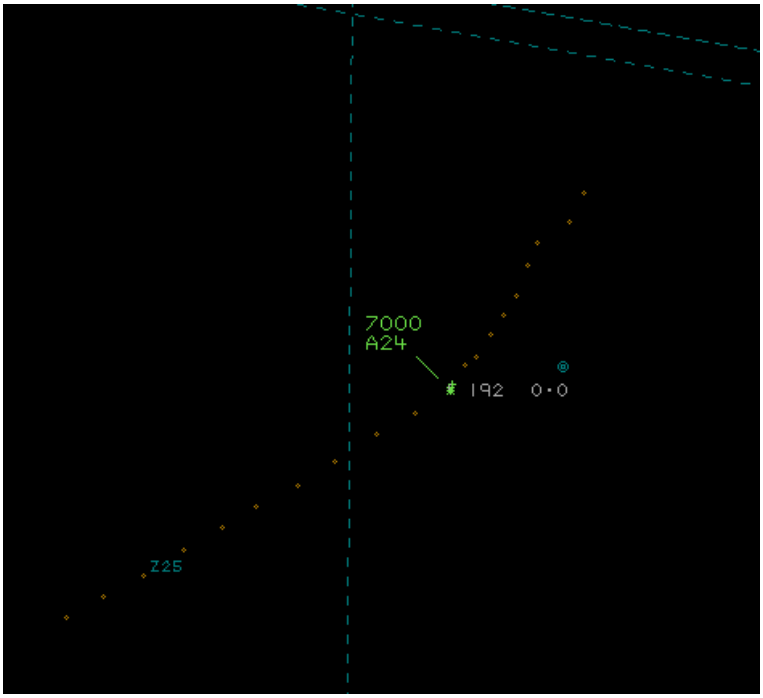


Figure 3 – CPA at 1244:10

The Mooney and unknown light-aircraft pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.[1] If the incident geometry is considered as head-on or nearly so then both pilots were required to turn to the right.[2]

Summary

An Airprox was reported when a Mooney M20J and an unknown light-aircraft flew into proximity at 1244hrs on Monday 5th August 2019. The Mooney pilot was operating under VFR in VMC and was listening out on Farnborough LARS.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of a report from the Mooney M20J pilot and radar photographs/video recordings. 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 was disappointed that the pilot of the unknown light-aircraft could not be traced, noting that, although the aircraft was visible as a primary track on radar, the lack of transponder information was a hindrance in this regard. This reduced the amount of information available to Board members and so its deliberations were limited to the information provided by the Mooney pilot and the NATS radar recordings. Whilst it was entirely possible that the light-aircraft was not transponder-equipped, the Board reminded all pilots of the need to comply with SERA.13001 which mandates that transponders in powered aircraft are to be selected with all modes at all times unless instructed otherwise by ATC.

The Board then considered the actions of the Mooney pilot. A GA member wondered if, not only as a means of increasing the visual conspicuity of his aircraft but also increasing the scope of his own lookout, the Mooney pilot habitually employed the technique of 'weaving' when in the cruise.

[1] SERA.3205 Proximity.
[2] SERA.3210 Right-of-way (c)(1) Approaching head-on.

Furthermore, the Mooney pilot was noted as listening-out on the Farnborough LARS frequency but it was unclear to members whether or not the Mooney pilot had requested a Service from Farnborough, was waiting for an appropriate moment to request a Service, or had simply elected to listen to the frequency. Members agreed that, given the fact that the unknown light-aircraft was visible as a primary track, had the Mooney pilot been able to agree a Traffic Service with Farnborough then, in all likelihood, he would have received Traffic Information on the primary track (**CF1**). As it was, the Mooney pilot had no situational awareness of the presence of the unknown light-aircraft because his PilotAware had no signal from the unknown light-aircraft with which it could interact (**CF2, CF3**). This left the see-and-avoid barrier as the only viable means of detection of the light-aircraft, and members agreed that the almost head-on, co-altitude encounter meant that the likelihood of visual detection was greatly degraded, and that this had led to an effective non-sighting by the Mooney pilot (**CF4**).

Turning to the actions of the unknown light-aircraft pilot, the Board wondered if the aircraft had been fitted with a transponder but that this had been turned off. A GA member briefed that the area in which the Airprox took place was a well-known area for pilots to practise aerobatic manoeuvres and, being situated beneath the London TMA and on the Heathrow extended centreline, there had been historic instances of high-energy manoeuvres from squawking aircraft in that location triggering Resolution Advisories (RAs) on TCAS-equipped aircraft on approach to Heathrow. Thus, anecdotally, it appeared that it can be common practice for pilots conducting aerobatic manoeuvres in this vicinity to switch their transponders to standby or off to avoid such nuisance RAs. The Board noted that the Mooney pilot stated that the unknown light-aircraft may have been taking late avoiding action by abruptly turning left and commencing a climb, but members considered that this may have been entirely coincidental or, indeed, a possible aerobatic manoeuvre. Notwithstanding the fact that the unknown light-aircraft's equipment was unknown to the Board, its members were unanimous in agreeing that, even when practising aerobatics, SERA.13001 is unambiguous in requiring transponders to be selected on if power supplies permit; for high-energy manoeuvres in the UK, the Mode A code is 7004.

In considering the risk, the Board was of the view that this had been a reasonably close encounter where separation had been reduced to well below the norm. However, because the unknown light-aircraft had seemingly manoeuvred (either intentionally or by coincidence) at this point, the Board did not think that the situation had fallen just short of a collision (Category A). Nevertheless, the Board agreed that the safety of both aircraft had not been assured and assessed the risk as Category B.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2019224		
CF	**Factor**	**Description**	**Amplification**
	Flight Elements		
	• Tactical Planning and Execution		
1	Human Factors	• Communications by Flight Crew with ANS	Apt ATS not requested by pilot
	• Situational Awareness of the Conflicting Aircraft and Action		
2	Contextual	• Situational Awareness and Sensory Events	Generic, late, no or incorrect Situational Awareness
	• Electronic Warning System Operation and Compliance		
3	Technical	• ACAS/TCAS System Failure	Incompatible CWS equipment
	• See and Avoid		
4	Human Factors	• Monitoring of Other Aircraft	Non-sighting or effectively a non-sighting by one or both pilots

Degree of Risk: B.

Safety Barrier Assessment[3]

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

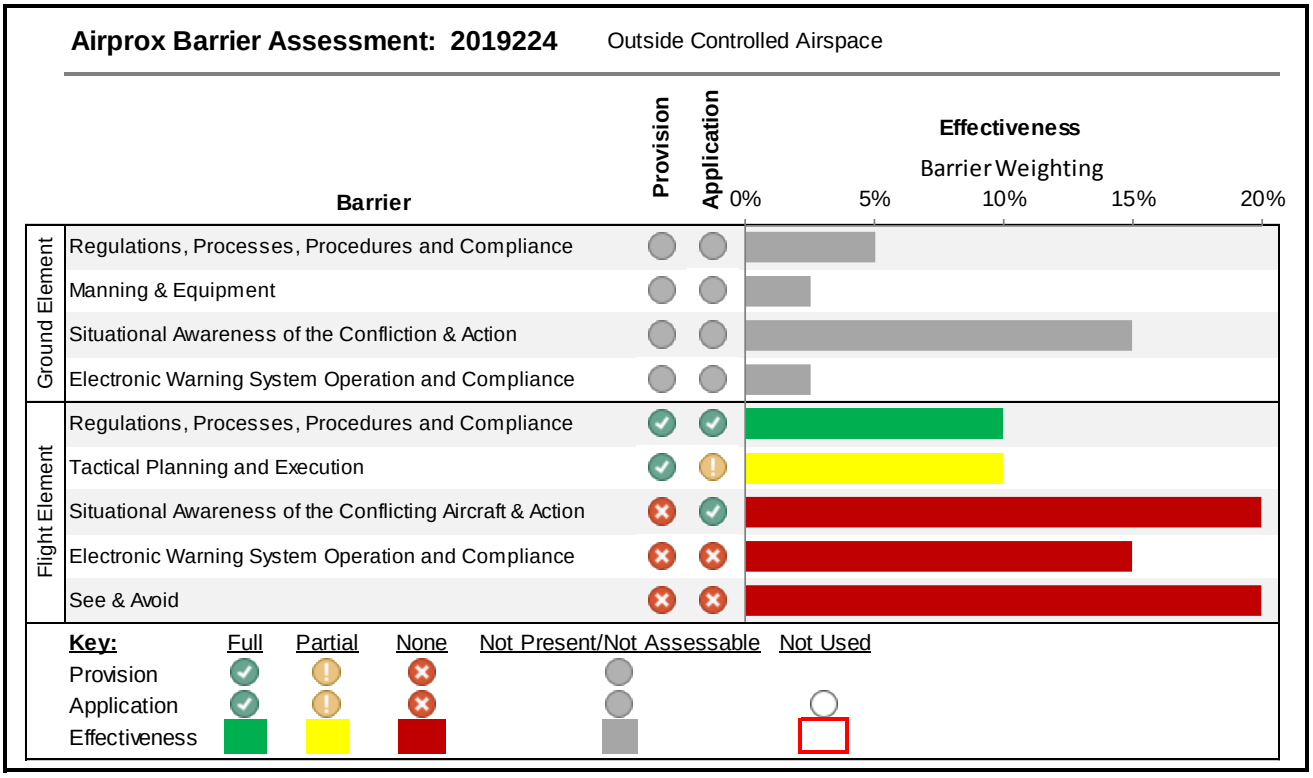
Flight Elements:

Tactical Planning and Execution was assessed as **partially effective** because the Mooney M20J pilot could have requested a Traffic Service from Farnborough LARS.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because there was no information available to the Mooney M20J pilot to alert him to the presence of the unknown light-aircraft.

Electronic Warning System Operation and Compliance were assessed as **ineffective** because the PilotAware equipment carried by the Mooney M20J pilot did not have a signal from the unknown light-aircraft with which it could interact.

See and Avoid were assessed as **ineffective** because the Mooney M20J pilot did not see the unknown light-aircraft until it was too late to materially affect the CPA. It was not known whether the unknown light-aircraft pilot had seen see the Mooney M20J.



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