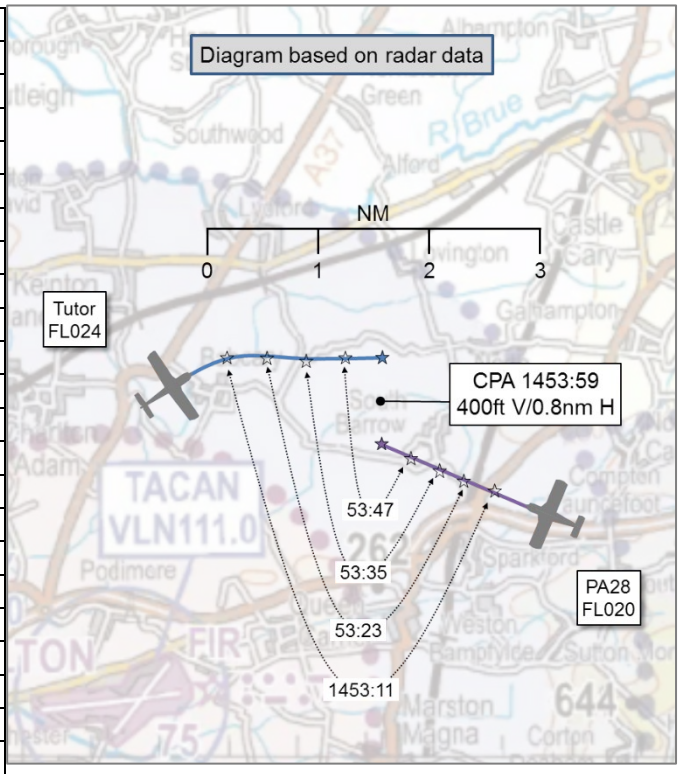
AIRPROX REPORT No 2018290

Date: 25 Oct 2018 Time: 1454Z Position: 5103N 00234W Location: 4nm NE Yeovilton

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Tutor	PA28
Operator	RN	Civ FW
Airspace	MATZ	MATZ
Class	G	G
Rules	IFR	VFR
Service	Traffic	Basic
Provider	Yeovilton APP	Yeovilton LARS
Altitude/FL	2400ft	2000ft
Transponder	A,C,S	A,C,S
Reported		
Colours	White/blue	White/blue
Lighting	HISL, nav	Strobes, nav
Conditions	IMC	VMC
Visibility	Nil	20km
Altitude/FL	2500ft	2050ft
Altimeter	QFE (1019hPa)	QFE (1019hPa)
Heading	050°	294°
Speed	NK	98kt
ACAS/TAS	TAS	Not fitted
Alert	TA	N/A
Separation		
Reported	Not seen <1nm V/400ft H on TAS	Not seen
Recorded	400ft V/0.8nm H	



THE TUTOR PILOT reports that they were being vectored for a Surveillance Radar Approach (SRA) to RW27 at Yeovilton, in receipt of a Traffic Service. They were climbed upwind from the usual pattern height of 2000ft QFE (1019hPa) to 2500ft, presumably to provide separation from MATZ crossing traffic; this put them into a thin layer of cloud. Downwind in the instrument pattern, they were given Traffic Information on a PA28 to the south, reported as 500ft below. He acknowledged this call and stated that they were IMC, implying that they would be unable to gain visual contact. TAS indicated traffic at 5nm. They held the TAS contact on the PA28, showing a closing vector and indicating 400ft low (height encoder quoted accuracy +/-175ft). His Safety Pilot (a current airline pilot) became concerned by the continued closure of the contact and queried whether it was under Yeovilton's control. He established that it was on the LARS (VHF) frequency. He further queried the pressure setting the PA28 was using, as it continued to show 400ft below; it was stated as using Yeovilton's QFE. The contact continued closing until it triggered a Traffic Alert on their TAS system (required parameters: <0.55 nm; <15-30sec closure; <+/-800ft) approximately 4nm ENE of Yeovilton at 1455. He actioned the Traffic Alert, manoeuvring briefly to break lateral collision geometry while maintaining indicated vertical separation. Once the conflicting PA28 had passed underneath, he declared their intention to file an Airprox report. On subsequently being cleared descent to 2000ft QFE pattern height, they were still intermittently IMC at the base of a broken cloud layer. Reflecting on this event, he accepted that, with hindsight, upgrading to a Deconfliction Service may have facilitated earlier avoiding action. He also acknowledged his ultimate responsibility for collision avoidance, which was effective. However, he was interested in the PA28 pilot's perception of events, particularly whether his MATZ crossing was conducted in genuine VMC, since 'see and avoid' procedures under a Basic Service were clearly invalid while they were in cloud. While the collision risk in this event may not ultimately have been high, the closest point of approach was uncomfortable and could have been avoided by a timely turn, affording

both lateral and vertical separation, negating the need for close range, pilot-initiated avoiding action in IMC.

He assessed the risk of collision as 'Low'.

THE PIPER PA28 PILOT reports that he was carrying out a 'mock test flight'. He was informed that the Airprox occurred near Yeovilton, which would have been on their initial nav section from Sturminster Newton and Bridgwater. This would have been just above the edge of the ATZ. Prior to MATZ penetration they were only able to maintain VMC at about 1700ft but on approaching the MATZ, the cloud was slightly higher so they climbed to 2050ft to remain above the ATZ. The cloud was only about 100ft higher. The Radar controller informed them of instrument traffic crossing in front of them but it was higher and in cloud. They were not visual but kept a look-out for it in case the pilot decided to descend.

THE YEOVILTON APPROACH/DIRECTOR CONTROLLER reports that he had one aircraft on frequency, the Tutor in the Radar Training Circuit (RTC) under a Traffic Service. He received a landline call from the LARS controller informing him of a MATZ-crosser crossing from southeast to northwest, 3nm north of the overhead maintaining 2000ft on the QFE of 1019hPa, which he acknowledged. The Tutor pilot had just completed a low approach and was climbing to 2000ft QFE on runway track as briefed before his approach. On the climb-out he instructed the Tutor pilot to climb to 2500ft QFE in order to build in 500ft separation because the MATZ crossing aircraft appeared as if it would conflict with the standard radar pattern which is normally conducted at 2000ft QFE. Upon reaching 2500ft QFE he turned the Tutor pilot right heading 050° on a downwind heading. He verbally asked the LARS controller what type of aircraft the MATZ crosser was in order to aid with Traffic Information, to which he replied that it was a PA28. When steady he called the MATZ crossing traffic to the Tutor pilot at approximately 5-6nm, stating that the traffic was 500ft below and that it was a PA28, which the pilot acknowledged. When approximately 1nm apart from the MATZ-crosser the pilot asked him what pressure setting the PA28 pilot was flying on; he responded saying *"I believe he is on the QFE"*. The pilot then asked if the PA28 pilot was under his control and he replied saying that it was under control of the LARS controller. The pilot then stated that from the equipment in his cockpit he believed that the PA28 was in fact 400ft below and that, based on the information the controller had provided, he would file an Airprox report, which he acknowledged. The Tutor pilot was descended to 2000ft QFE when 3nm clear of the MATZ crossing traffic and the approach was continued as normal.

He assessed the risk of collision as 'Low'.

THE YEOVILTON LARS CONTROLLER reports that the PA28 pilot contacted him requesting a Basic Service routing from Exeter to Sturminster Newton then Bridgwater and back to Exeter. They were given the squawk 4370, a Basic Service and the Portland RPS 1018hPa. When they were approximately 8nm to the southeast they changed their heading towards the northwest and requested a MATZ crossing. He requested what altitude they wanted for the MATZ cross because they were previously at 2000ft RPS. They responded that they wanted 2000ft 'on 1022' (or something like that). He asked if they could accept flight at height 2000ft QFE, 1019hPa, which was agreed. He contacted the Approach controller first to see if he could get the 2000ft QFE 1019hPa and they commented that they had nothing to affect. The MATZ cross was also approved by Tower at 2000ft QFE. He then informed the PA28 pilot that their VFR MATZ penetration was approved at 2000ft QFE, 1019hPa, and cautioned them that RW27 was the duty runway. Having seen the RTC traffic he called it to the MATZ-crosser so they did not climb of their own accord into its level. He believed that the PA28's Mode Charlie at this point was about 400ft below the Tutor. He may have mistakenly called the aircraft a rotary having got it confused with another approach track but he could not remember that detail. Whilst dealing with and monitoring the other LARS tracks he saw that the PA28's heading would take it behind the RTC traffic. In his opinion there was sufficient separation between the two tracks and he did not see any risk of collision so no further action was taken before returning to his other tracks.

He assessed the risk of collision as 'None'.

THE RADAR SUPERVISOR reports that he was aware of the LARS controller passing MATZ crossing Traffic Information to the APP controller. As previously stated the APP controller initially climbed the Tutor pilot to 2000ft QFE iaw previously passed low approach instructions but then, subsequently, he instructed the Tutor pilot to climb to 2500ft QFE. At no point in the control of both of the aircraft, MATZ crossing or in the RTC, did he believe that there was any confliction and, since the APP controller was newly qualified, he felt that the separation that he had built in was sufficient to provide separation until clear of the MATZ crossing traffic.

Factual Background

The weather at Yeovilton was recorded as follows:

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METAR EGDY 251450Z 29009KT 9999 SCT022 BKN120 12/07 Q1022 WHT NOSIG=
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Analysis and Investigation

NCHQ

Both the LARS controller and Approach controller were fully aware of the developing situation with the PA28 conducting a MATZ cross and the Tutor in the RTC and the potential for confliction.

The Tutor pilot was in receipt of a Traffic Service and the PA28 was in receipt of a Basic Service. Nevertheless the Approach controller elected to apply 500ft regulatory-approved deconfliction minima to the Tutor in order to maintain flow progression within the RTC and in accordance with UK FIS Traffic Service where:

> *When providing headings/levels for the purpose of positioning and/or sequencing or as navigational assistance, the controller should take into account traffic in the immediate vicinity based on the AS's relative speeds and closure rates so that a risk of collision is not knowingly introduced by the instructions passed. However, the controller is not required to achieve defined deconfliction minima and pilots remain responsible for collision avoidance even when being provided with headings/ levels by ATC.*

With deconfliction minima having been applied under a Traffic Service for the Tutor, all indications suggesting that their SSRs were operating within parameters, and both pilots being in receipt of Traffic Information, no conflict was evident to the controller. However, the aircrew in the Tutor became concerned by the PA28 due to TAS information and a Traffic Alert where the PA28 indicated only 400ft below with the Tutor in intermittent IMC. Whilst Traffic Service may not have been the most appropriate service given the conditions (as highlighted by the Tutor aircrew), should a Deconfliction Service have been provided to the Tutor pilot with the PA28 under a Traffic Service then the deconfliction minima would have remained 500ft.

Both controllers effectively discharged their responsibilities in the provision of a Traffic Service to both pilots and this Airprox primarily highlights SSR Mode C height encoding tolerance issues. Screen shots are provided from the NATS radars which are not used by the Yeovilton controllers and so may not represent the same display information that they were using.

At 1452:49 (Figure 1), Traffic Information was passed to the PA28 pilot about the Tutor, by the LARS controller: *"traffic left 11 o'clock 3 miles crossing left to right ahead 400 feet above".*

At 1452:56 (Figure 2), Traffic Information was passed to the Tutor pilot about the PA28, by the Approach controller *"traffic southeast 4 miles tracking northwest 500 feet below that's a PA28".*

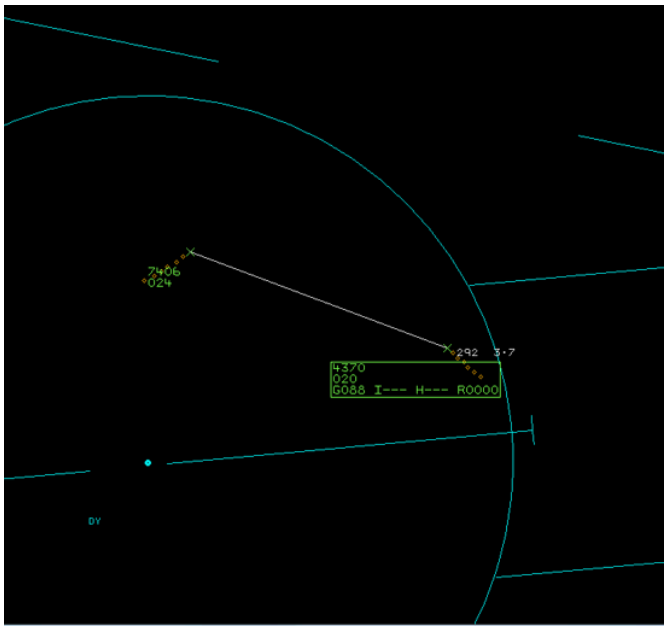


Figure 1. 1452:49

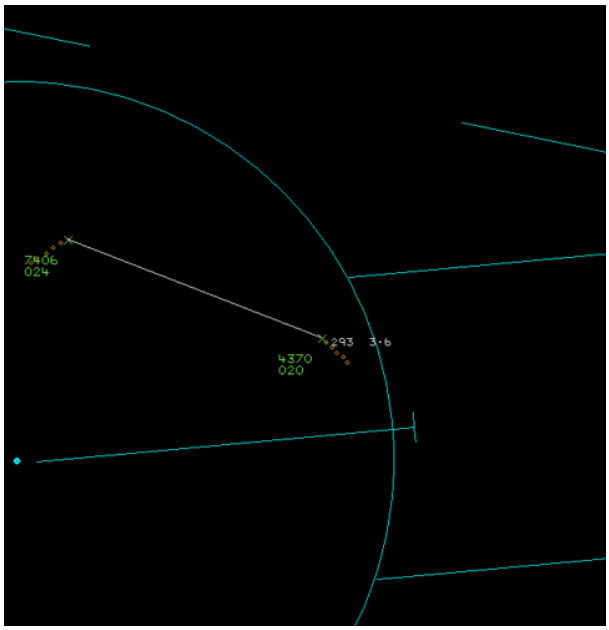


Figure 2. 1452:56.

Squawk 4370 - PA28; 7406 - Tutor.

CPA occurred at 1454:01 (Figure 3), with an indicated separation of 400ft vertically and 0.8nm horizontally.

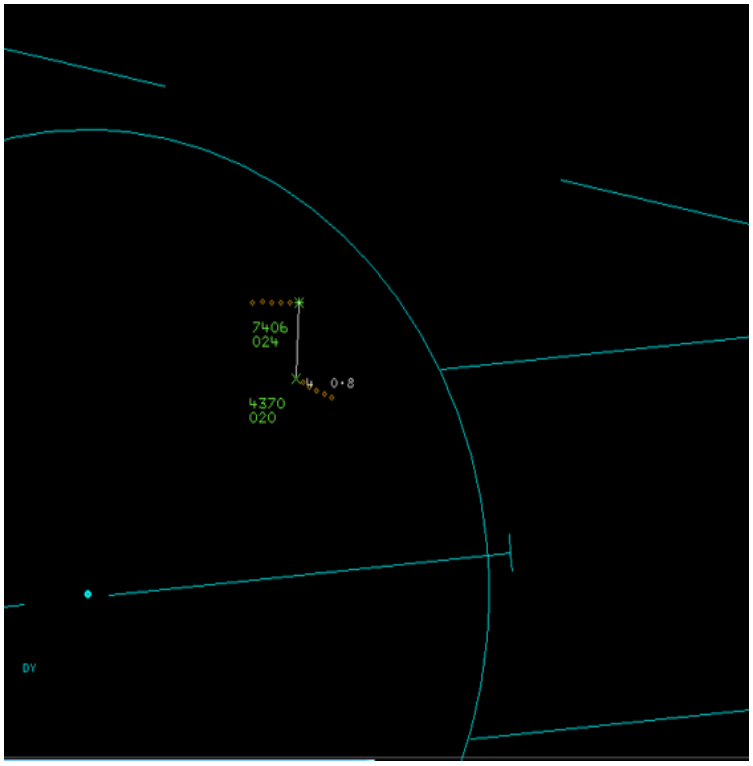


Figure 3. 1454:01 CPA.

UKAB Secretariat

The Tutor and PA28 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard[1]. Because the incident geometry is considered as converging then the Tutor pilot was required to give way to the PA28[2].

[2] SERA.3210 Right-of-way (c)(2) Converging. MAA RA 2307 paragraph 12.

With regard to VMC flight, SERA[3] states that:

…in Class G airspace, at and below 3000ft amsl, the flight conditions for VMC flight are a visibility of 5km and clear of cloud and with the surface in sight. Flight visibilities reduced to not less than 1500m may be permitted for flights operating: at speeds of 140 kts IAS or less to give adequate opportunity to observe other traffic or any obstacles in time to avoid collision.

Summary

An Airprox was reported when a Tutor and a PA28 flew into proximity in the Yeovilton MATZ at 1454hrs on Thursday 25th October 2018. The Tutor pilot was operating under IFR in IMC, the PA28 pilot was operating under VFR in VMC. The Tutor pilot was in receipt of a Traffic Service from Yeovilton Approach and the PA28 pilot was in receipt of a Basic Service from Yeovilton LARS.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, the controllers involved and the appropriate ATC and operating authorities.

The Board first looked at the actions of the Tutor pilot and noted that he was in receipt of a Traffic Service from Yeovilton Approach whilst being vectored for a Surveillance Radar Approach to RW27 at Yeovilton under IFR. Following internal coordination by the Yeovilton App and LARS controllers, the Tutor pilot was given a climb to 2500ft QFE (which resulted in him entering cloud) and was informed of the MATZ-crossing PA28 at 2000ft QFE. The Board noted that the Tutor pilot had reported being concerned that his TAS had shown the vertical separation as 400ft, not the 500ft he had been advised. He had also commented that the two aircraft continued on a closing vector until he received a Traffic Alert on his TAS whereupon he had manoeuvred briefly to break the lateral collision geometry but had maintained his level. The Board noted that the radar recordings of the incident indicated that the two aircraft were separated by only 400ft vertically but controller members explained that this is within SSR parameters of accuracy. An aircraft may be considered to be at an assigned level provided that the Mode C readout indicates 200 feet or less from that level. Although a controller should not knowingly vector an aircraft into conflict, members noted that it was not a requirement for separation to be provided by the controllers because the Tutor pilot was not in receipt of a Deconfliction Service. Although the Board welcomed the controllers' initiative in providing vertical separation between the aircraft, under the Traffic Service he had requested it was for the Tutor pilot to give way to the other traffic if he felt that a conflict was imminent (the PA28 was converging from his right), even when IMC, or request a Deconfliction Service if he wanted vectors.

Under a Deconfliction Service, military controllers are permitted to provide only 500ft separation for military aircraft against known traffic, although civil controller members commented that they, in the same circumstances, would be required to provide vertical separation of 1000ft. Traffic Information was provided to the pilots of both aircraft in accordance with requirements of their respective Traffic Service and Basic Service: when the two aircraft were about 5-6nm apart, the Approach controller passed Traffic Information to the Tutor pilot, advising him that the PA28 was 500ft below him; Traffic Information was also issued to the PA28 pilot about the Tutor.

For his part, in maintaining VMC the PA28 pilot was entitled to fly 'clear of cloud and with the surface in sight'. His aircraft was not TAS-equipped so he was largely relying on information from the controller as to the location of any other aircraft above in cloud. Although he might reasonably expect to get such information during his MATZ crossing, this was not assured under a Basic Service and some members opined that he would have been better served by also requesting a Traffic Service whilst in contact with the Yeovilton controller.

[3] SERA.5001 VMC visibility and distance from cloud minima.

In determining the cause and risk, the Board quickly agreed that the Tutor pilot had become concerned about the proximity of the PA28 because of his TAS indications. Had his aircraft not been fitted with TAS then he would likely have accepted the controller's instructions without question even though he was IMC. As a result, the Board agreed that the incident was probably best described as a TAS sighting report prompted by his Mode C indicating that his aircraft was below 2500ft and therefore not the 500ft above the PA28 that he had been advised to expect. Turning to the risk, the Board noted that, notwithstanding the Mode C indication of the Tutor, the two pilots had been allocated and were flying at levels which provided deconfliction minima between the two aircraft. As a result, they therefore agreed that normal safety standards had pertained; risk Category E.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: A TAS sighting report.

Degree of Risk: E.

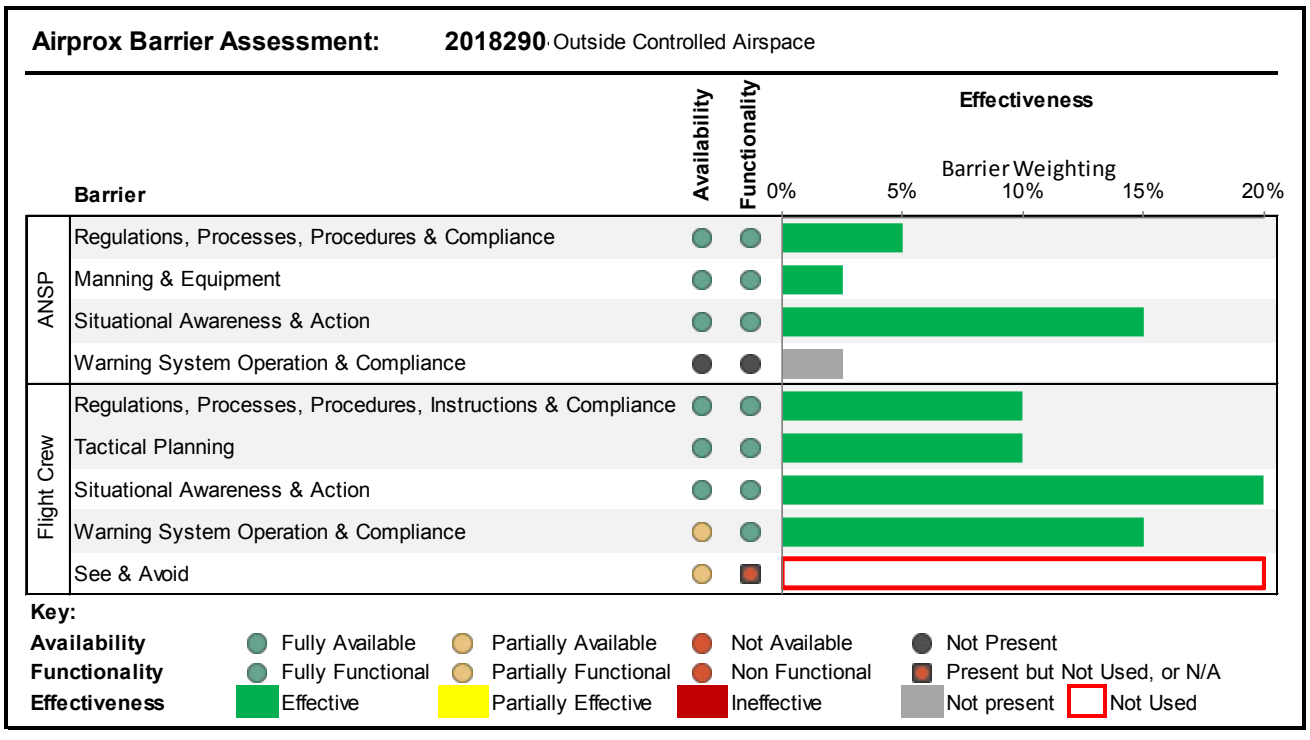
Safety Barrier Assessment[4]

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

Flight Crew:

Warning System Operation and Compliance were assessed as **partially available** because only the Tutor was equipped with an electronic warning system which was able to detect the presence of the PA28.

See and Avoid were assessed as **not used** because although neither pilot could see the other aircraft, they did not need to because they were separated vertically by ATC coordination.



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