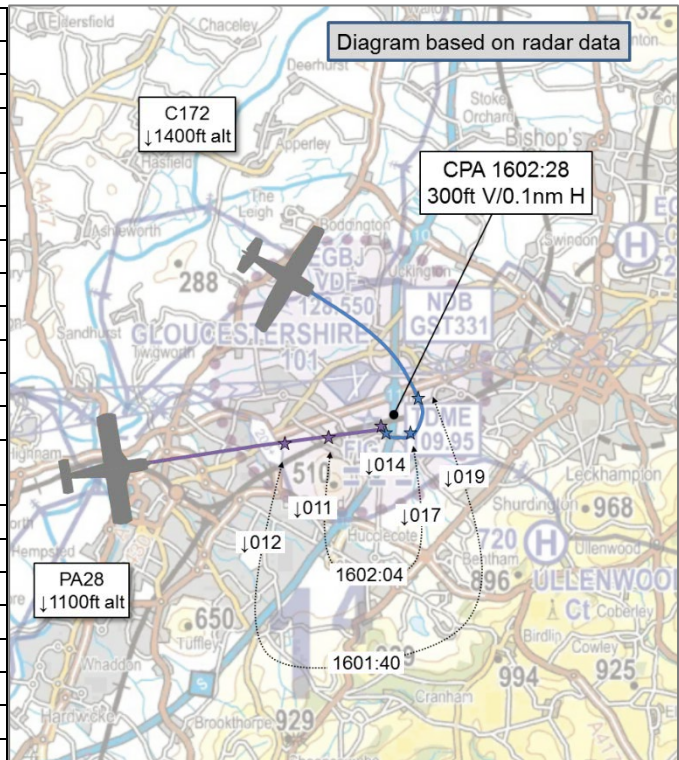


AIRPROX REPORT No 2019015

Date: 25 Jan 2019 Time: 1602Z Position: 5152N 00209W Location: Gloucestershire ATZ

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	C172	PA28
Operator	Civ FW	Civ FW
Airspace	Gloucestershire ATZ	Gloucestershire ATZ
Class	G	G
Rules	VFR	VFR
Service	ACS	ACS
Provider	Gloster	Gloster
Altitude/FL	1400ft	1100ft
Transponder	A, C	A, C, S
Reported		
Colours	White	White, Burgundy
Lighting	Beacon	Nav, Landing, Strobe
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	1300ft	1000ft
Altimeter	QFE (1011hPa)	QFE (1013hPa)
Heading	280°	090°
Speed	90kt	90kt
ACAS/TAS	Not fitted	Not fitted
Separation		
Reported	2-300ft V/0m H	500ft V/20m H
Recorded	300ft V/0.1nm H	



THE C172 PILOT reports that on returning to the airfield from the northwest he was given a standard overhead join for RW27R and asked to report deadside. Before reaching the overhead, another aircraft was heard reporting at the river bend to the southwest of the ATZ and requesting a 'direct join'. The C172 instructor did not then hear any further communication between ATC and this aircraft due to an instructional discussion with his student. They reported when deadside at 2200ft (AAL) and were then cleared to descend further and asked to report downwind. The student commenced the descent and, when passing through 1300ft, a PA28 was observed about 2-300ft below (i.e. at circuit height), flying in the opposite direction. They were about 650m south of the RW36 threshold, turning towards the crosswind leg for RW27; the other aircraft was observed on their right, between them and the airfield. The PA28 continued downwind left-hand and joined for left-base RW27, a non-standard join. He opined that a collision was only averted because the student had started the overhead descent later than would be normal practice and they had arrived deadside at 2200ft instead of the more usual 2000ft. The close proximity of the other aircraft was reported on the frequency to ATC.

He assessed the risk of collision as 'High'.

THE PA28 PILOT reports that on returning to Gloucester after a navigational exercise, the student requested a direct join (for practise) and was cleared for a non-standard, deadside downwind for RW27L, because they were joining from the southwest. The student reported joining downwind RW27L and they knew there was someone joining overhead, which was not sighted at that time. At mid-point downwind RW27L, at 1000ft QFE, they saw the other aircraft descending to their right, around 500ft higher. The C172 pilot reported 'descending deadside' and then mentioned an unknown aircraft (the PA28) 300ft below, so he presumably didn't hear that the PA28 had been cleared to join direct for RW27L and seemed surprised that they were there too. The PA28 pilot could not recall the RT exchange between the C172 and ATC and so wasn't sure whether he had been cleared to descend

deadside or asked to hold in the overhead. Once the C172 had passed they were asked to commence a right-hand orbit due to IFR traffic.

He assessed the risk of collision as 'Medium'.

THE GLOUCESTER CONTROLLER reports that the C172 was descending deadside following a standard overhead join for RW27RH. The PA28 was joining downwind left-hand for RW27. He was unaware that an Airprox had occurred at the time. The Airprox appeared to have occurred on the deadside where the C172 pilot reported that the PA28 was 300ft below him.

Factual Background

The weather at Gloucestershire was recorded as follows:

METAR EGBJ 251550Z 28008KT 9999 FEW025 11/08 Q1014=

Analysis and Investigation

CAA ATSI

The runway in use at Gloucester was RW27, promulgated as a standard right-hand circuit pattern. The PA28 pilot was returning to the aerodrome from the southwest after completion of a Navex and had requested (and was cleared for) a direct join (non-standard, deadside, left-hand circuit for RW27). The C172 was returning to the aerodrome from the northwest after completion of a training flight in the local area. The pilot was carrying out a standard overhead join for a right-hand circuit RW27. The Gloucester controller was providing a combined Aerodrome and Approach Non-Radar Service at the time of the Airprox and was controlling traffic on an instrument approach, other traffic in the visual circuit and traffic moving on the aerodrome. All control instructions were readback in full and accurately by the pilots of both aircraft throughout the event.

At 1556:50, the C172 pilot reported 7nm NW of the aerodrome and requested re-join. The pilot was cleared for a standard overhead join for RW27RH, QFE 1011 and instructed to report 3nm to run. At 1557:50, the PA28 pilot reported 7.5nm SW of the Aerodrome and requested a direct join. The pilot was cleared to join direct, downwind left-hand RW27, QFE 1011 and instructed to report 3nm to run.

The C172 pilot reported 3nm to run at 1559:10 and was instructed to report descending deadside. At 1600:31 (Figure 1), the PA28 pilot reported 3nm to run and was advised to report downwind left-hand RW27. At 1601:18 (Figure 2), the C172 pilot reported descending deadside and was instructed to report downwind.

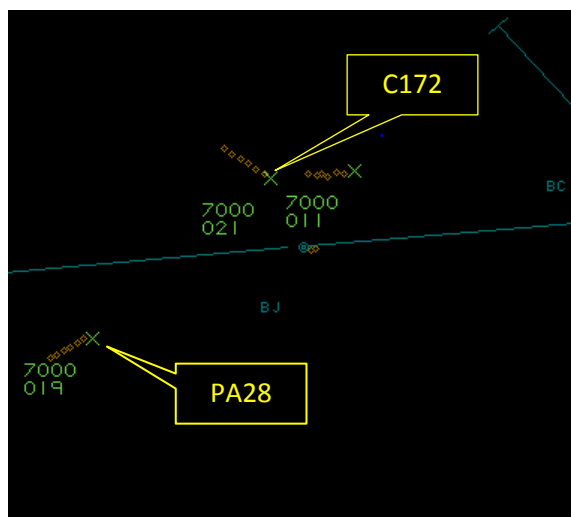


Figure 1 - 1600:31

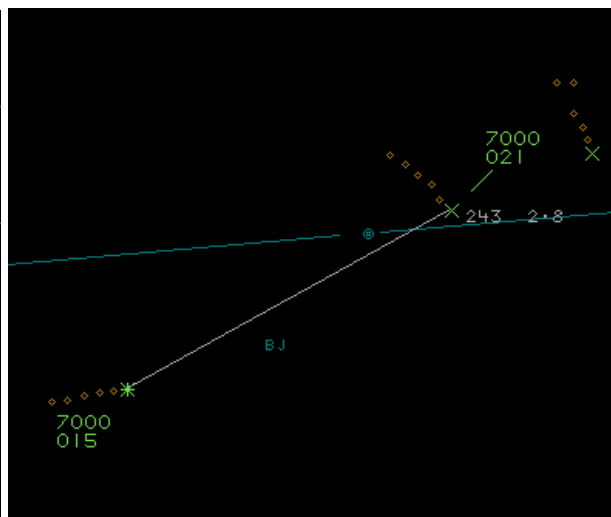


Figure 2 - 1601:18

At 1602:10 (Figure 3), the PA28 pilot reported downwind left-hand RW27, to land. The pilot was instructed to report before turning base. CPA occurred at 1602:27 (Figure 4), with the aircraft separated by 0.1nm laterally and 300ft vertically.

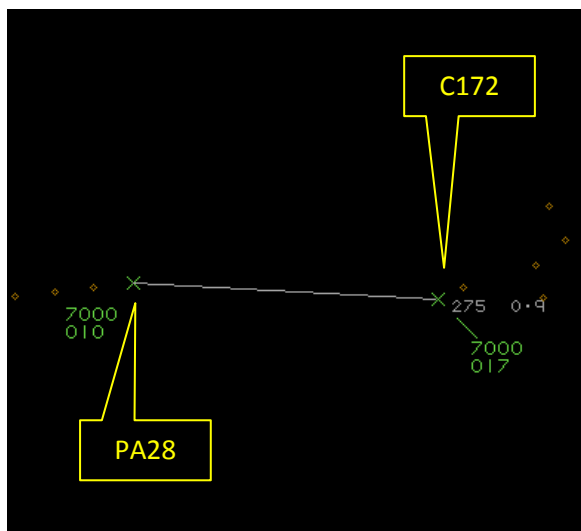


Figure 3 - 1602:10

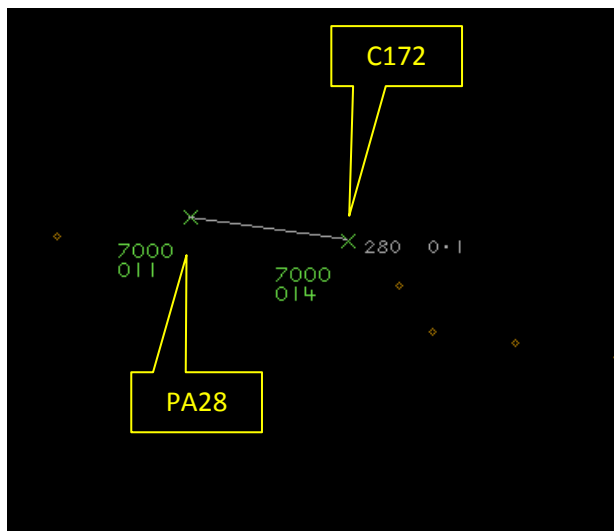


Figure 4 - 1602:27

The C172 pilot had been cleared to carry out a standard overhead join, from the NW, for the promulgated right-hand visual circuit RW27. The standard overhead join flown by the C172 was as promulgated in CAP 493 (as repeated in the Gloucester Airport Guide to Flying, a link to which is included in the Gloucester Airport AIP entry). The Gloucester MATS Part 2 does not contain any published differences to the standard CAP 493 procedure.

The PA28 pilot had been cleared to carry out a non-standard left-hand downwind join for RW27 from the SW. No information on circuit activity was provided to the pilots of either aircraft on their initial R/T calls at 7nm and 7.5nm respectively, or on any of their subsequent R/T calls. Furthermore, neither of the pilots received Traffic Information on each other at any point prior to the Airprox occurring.

Relevant extracts from UK AIP entry for Gloucester are as follows:

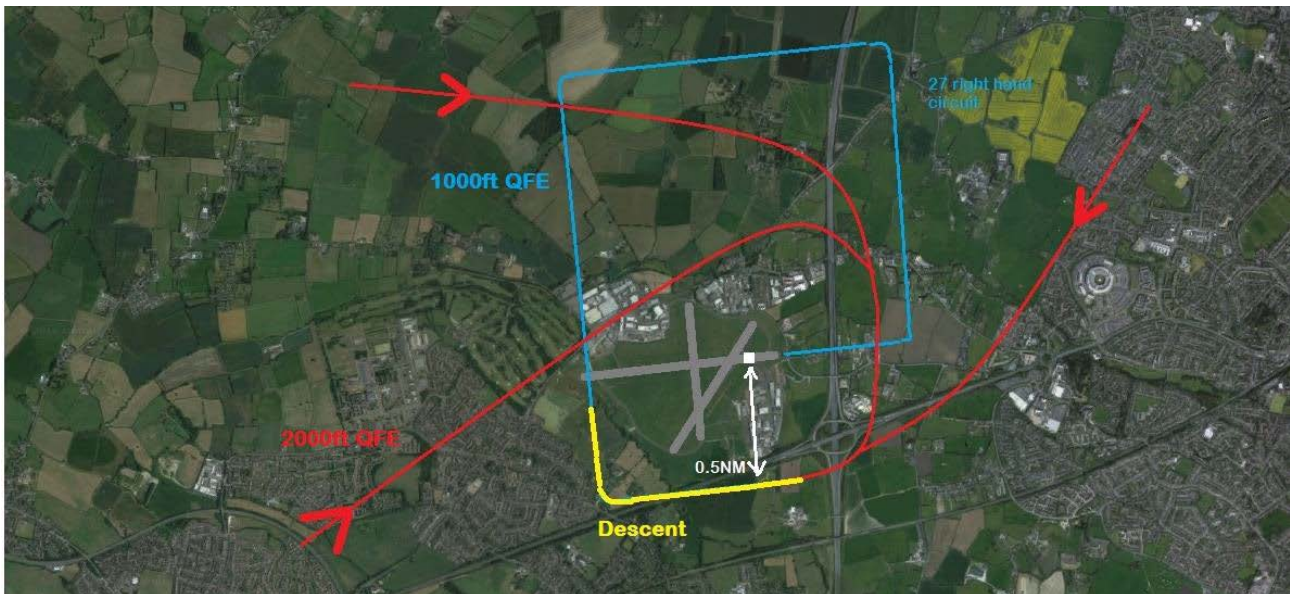
EGBJ AD 2.22 FLIGHT PROCEDURES

1 Procedures for Inbound Aircraft

VFR Arrivals: Arriving VFR flights are to establish communications with ATC at least 5 minutes prior to ETA for overhead and at not less than 5 DME. Fixed wing aircraft will normally be instructed to make a Standard Overhead Join. Pilots wishing to join for downwind, base leg or straight-in approaches should request 'Direct Join' on initial contact. Direct joins may be issued with a vertical restriction e.g. not below 1500 ft QFE, to facilitate circuit integration. Such a restriction does not absolve pilots from the requirement to remain in VMC at all times. Inbound flights should avoid Instrument Approach let-down areas and departure climb-outs at all times. Further guidance for visiting pilots is available to download <https://www.gloucestershireairport.co.uk/wp-content/uploads/2016/05/Guide-to-Flying.pdf>

The diagram below is taken from the above-mentioned Gloucester Guide-to-Flying document:

The picture below shows three typical overhead joining profiles for a right-hand circuit on Runway 27. The blue circuit phase is simply indicative, its shape and size will depend on other traffic:



Relevant extracts from CAP 493 (Aerodrome Control) are as follows:

7. Information to Aircraft

7A. Traffic Information and Instructions

7A.1 Traffic information and instructions shall be passed to aircraft on any occasion that a controller considers it necessary in the interests of safety, or when requested by a pilot. Aerodrome Control shall provide:

- (1) generic traffic information to enable VFR pilots to safely integrate their flight with other aircraft;
- (2) specific traffic information appropriate to the stage of flight and risk of collision;
- (3) timely instructions as necessary to prevent collisions and to enable safe, orderly and expeditious flight within and in the vicinity of the ATZ.

7A.2 MATS Part 2 shall detail local procedures for the integration of aircraft in the vicinity of the Aerodrome.

18A. Joining Circuit

18A.1

Clearance to enter a traffic circuit is issued when an aircraft is still some distance from the aerodrome to enable the pilot to conform with the traffic circuit, pending clearance to land. Information concerning landing direction or runway in use and any other necessary instructions are given at the same time so that the pilot may intelligently position himself in the traffic pattern.

18A.2

Aircraft may be cleared to position overhead the aerodrome for a standard overhead join. In these circumstances the aircraft will report overhead at 2,000 feet above aerodrome elevation, subject to remaining in VMC; and, when cleared to descend will route to the dead side of the circuit descending to circuit height. The aircraft will then cross the upwind end of the runway in use at circuit height, then position accordingly into the existing traffic pattern to report downwind. Any variance on this procedure must be notified in MATS Part 2 and the phraseology "standard overhead join" must not be used in such circumstances.

Relevant extracts from Gloucester MATS Part 2 are as follows:

2.6 Re-join Procedures

2.6.1 *The default re-join procedure for VFR traffic is the standard overhead join. Subject to co-ordination, a direct joining clearance may be issued to any point within the circuit. Details of co-ordination are contained within the Aerodrome Control and Approach Control sections of this document.*

2.2.15 **Information to Circuit Aircraft**

ADC must advise all arriving traffic and departures joining the circuit of the number of aircraft in and joining the fixed wing and heli circuits. Additional position information may be passed as required to assist pilots.

2.2.16 **Non-Standard Circuits**

ADC is to ensure that sufficient information is passed to both fixed wing and helicopter pilots, to enable them to position themselves appropriately when non-standard circuits, such as low level, EFATO, glide and crosswind approaches, are in use. It may be possible to alter the pattern of the heli circuit to accommodate certain types of flight. E.g. When RWY 27 and 22 are in use, helis may be instructed to remain north of both runways by flying an abbreviated circuit pattern.

UKAB Secretariat

The C172 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 hazard¹. If the incident geometry is considered as head-on or nearly so then both pilots were required to turn to the right².

Occurrence Investigation

A Gloucestershire ATC investigation reported that the Airprox was not declared on the RT and so the controller was not aware of it at the time of the incident, furthermore the ATM was unserviceable. They commented that it is not standard practice to offer traffic a downwind join with traffic joining through the overhead due to the chance that it can result in an opposite direction conflict. Although the controller approved the downwind left-hand join, he did not pass Traffic Information to the either aircraft and therefore standard procedures were not followed.

Summary

An Airprox was reported when a C172 and a PA28 flew into proximity in the Gloucestershire visual circuit at 1602hrs on Friday 25th January 2019. Both pilots were operating under VFR in VMC and receiving an ACS from Gloster Tower.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, transcripts of the relevant R/T frequencies, radar photographs/video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities. 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 looked at the actions of the Gloster ADC. He was responsible for providing a safe and expeditious flow of air traffic and most likely thought that by clearing both pilots to join as they did he was assisting them in providing the join they wanted. However, controller members noted that allowing

¹ SERA.3205 Proximity. MAA RA 2307 paragraphs 1 and 2.

² SERA.3210 Right-of-way (c)(1) Approaching head-on. MAA RA 2307 paragraph 13.

an aircraft to join through the overhead at the same time as allowing one to join deadside against the flow of traffic, was incompatible, and was always going to end up with the two aircraft in conflict (CF4). Furthermore it appeared that he hadn't anticipated this conflict (CF3) because he did not provide Traffic Information to either pilot (CF5). Members thought that holding one aircraft out of the circuit would have been the safest option in these circumstances. Noting that the Gloucestershire ATC investigation highlighted that this was not standard practice, the Board agreed that standard procedures had not been complied with (CF1). They also thought that had the controller had a serviceable ATM he may have had an opportunity to check the position of the joining aircraft and seen that they were likely to come into proximity, without it he was denied that barrier (CF2).

For his part, the C172 pilot was joining normally through the overhead and did not expect to see another aircraft in the opposite direction. Although the controller did not give Traffic Information to the pilot, the Board noted that he should have been able to hear the PA28 pilot as he called for his deadside join and this should have provided situational awareness. However, the C172 pilot reported not hearing such calls due to instructing his student, and so he had no awareness of the joining PA28 (CF6). Consequently, he did not see the PA28 until it crossed beneath him (CF7), fortuitously 300ft below.

The PA28 pilot had asked ATC for a non-standard join from the southwest, joining directly onto a left-hand downwind position (deadside); this meant that he would be routing in the opposite direction to other circuit traffic. Members noted that he had made his initial request 1min after the C172 had called for an overhead join, and so, if he was not on frequency, he may not have assimilated that the C172 was joining at the time. However, he should have heard the C172 pilot's subsequent calls and, knowing that he was joining in a non-standard manner, the opportunity was there for him to realise that there was potential for conflict (CF6). Moreover, he reported not knowing whether the C172 was supposed to hold in the overhead or not, and members opined that it was always worth seeking further information by RT in such circumstances; had he asked ATC for the position of the overhead join, this may have prompted the controller to provide some deconfliction. Ultimately, the PA28 pilot didn't see the C172 until their paths crossed (CF7), and at that point could see that the other aircraft was well above and that avoiding action was not necessary.

When assessing the risk, the Board agreed that it had been fortuitous that the two aircraft had had 300ft separation because neither pilot had assimilated that there would be a conflict. However, because avoiding action was not necessary, they agreed that although safety had been degraded, there was no risk of collision; risk Category C.

PART C: ASSESSMENT OF CAUSE AND RISK

Contributory Factors:

C F	Factor	Description	Amplification
	Ground Elements		
	• Regulations, Processes, Procedures and Compliance		
1	Human Factors	• ATM Regulatory Deviation	Regulations and/or procedures not complied with
	• Manning and Equipment		
2	Technical	• Aerodrome and ATM Equipment	Non-Functional equipment
	• Situational Awareness and Action		
3	Human Factors	• Conflict Detection - Not Detected	
4	Human Factors	• Inappropriate Clearance	Controller instructions contributed to the conflict
5	Human Factors	• Traffic Management Information Provision	Not provided, inaccurate, inadequate, or late

Flight Elements		
• Situational Awareness of the Conflicting Aircraft and Action		
6	Human Factors	• Understanding/Comprehension Pilot did not assimilate conflict information
• See and Avoid		
7	Human Factors	• Monitoring of Other Aircraft Late-sighting by one or both pilots

Degree of Risk: C.

Safety Barrier Assessment³

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

Ground Elements:

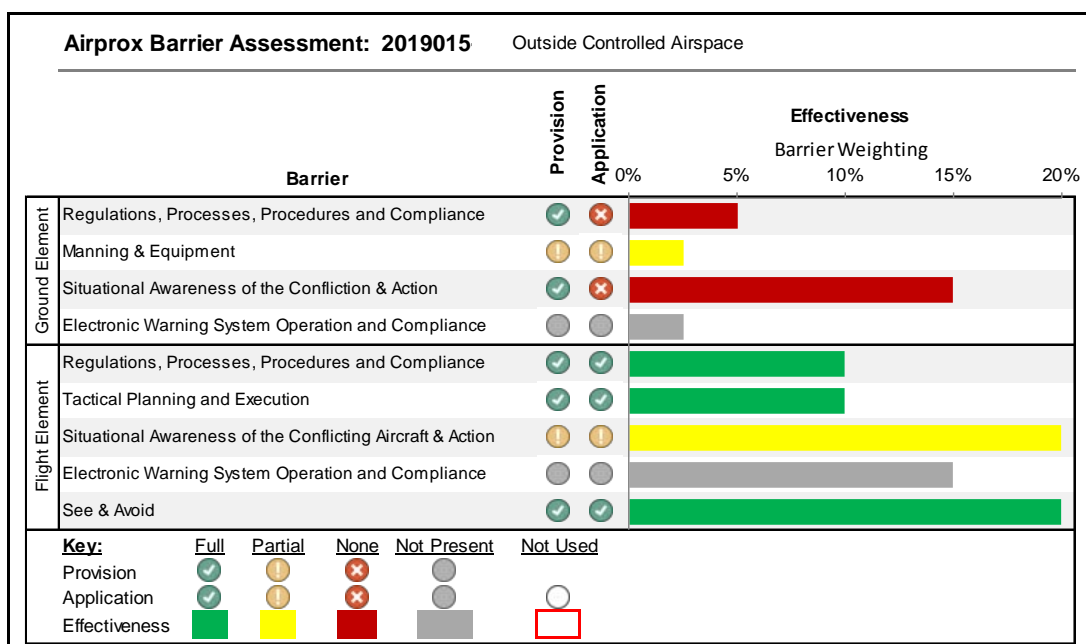
Regulations, Processes, Procedures and Compliance were assessed as **ineffective** because ATC should have integrated the 2 aircraft and provided Traffic Information.

Manning and Equipment were assessed as **partially effective** because the ATM in the tower was unserviceable.

Situational Awareness and Action were assessed as **ineffective** because the ADC did not foresee the confliction and did not give Traffic Information to the pilots.

Flight Elements:

Situational Awareness and Action was assessed as **partially effective** because although there was generic Traffic Information available from the RT due to both pilots being on the same frequency, neither pilot fully assimilated that the other would be a factor.



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