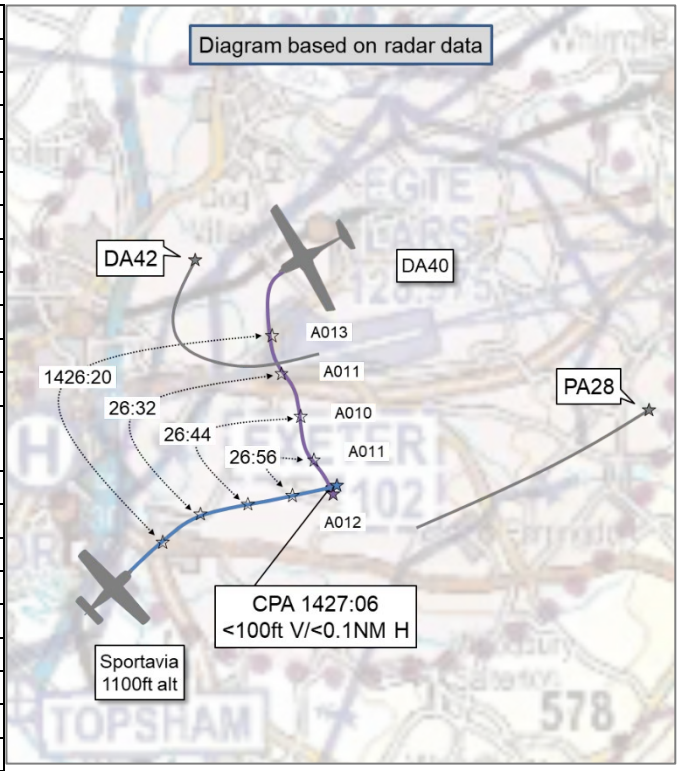
AIRPROX REPORT No 2020136

Date: 11 Sep 2020 Time: 1427Z Position: 5043N 00325W Location: Exeter Airport – elev 102ft

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Sportavia	DA40
Operator	Civ FW	Civ FW
Airspace	Exeter ATZ	Exeter ATZ
Class	G	G
Rules	VFR	VFR
Service	ACS	ACS
Provider	Exeter	Exeter
Altitude/FL	~FL010	~FL011
Transponder	A, C	A, C, S
Reported		
Colours	White	White, red
Lighting	Strobes, beacon	Strobe, nav, landing, taxi
Conditions	VMC	VMC
Visibility	>10km	>10km
Altitude/FL	1000ft	1100ft
Altimeter	QFE (NK)	QNH (NK)
Heading	080°	170°
Speed	80kt	100kt
ACAS/TAS	Not fitted	TAS
Alert	N/A	None
Separation		
Reported	100ft V/100m H	50ft V/0m H
Recorded	<100ft V/<0.1NM H	



THE SPORTAVIA PILOT reports returning to Exeter Airport when, about 10 miles out, another pilot was heard on the Exeter Radar frequency saying they were inbound; 2 other aircraft were also heard on frequency. The impression was formed, from the other pilot's radio calls, that they might not be experienced or adept, so a mental note was made to take extra care in the circuit if they were going to be there simultaneously. The Tower was contacted for joining instructions and clearance given for a left-hand downwind join for RW26. As the clearance was passed the inbound pilot declared the intention for an overhead join for the same runway. The inbound pilot was instructed to descend deadside while the Sportavia pilot joined downwind. The controller told the joining pilot to keep a lookout for other aircraft in the circuit; one was another private flight on left base and the other a commercial light twin on long finals, about 10 miles out. The Sportavia pilot joined downwind as instructed, at the correct circuit height and on the correct reciprocal heading for the runway, and called downwind as they came abeam the upwind end of the runway, all the time keeping an eye out to the left for the other aircraft after its deadside descent. The Sportavia pilot anticipated that the other aircraft would cross the upwind end of the runway, somewhere astern, but instead it was (perceived as being) in the 10:30 position at the same level, crossing the runway half-way along its length at 90°. There was no relative motion, so it was apparent that they were on a collision course. The controller asked the other pilot whether they were visual, but by this time the Sportavia pilot assumed this was not the case, took evasive action and reported that they had seen him and that they were descending. After turning gently left and descending to attempt to pass under the other aircraft's tail, the Sportavia pilot distinctly remembered looking vertically upwards through the bubble canopy and seeing the other aircraft about 100ft almost directly above, crossing left to right. The whole incident from first sighting to passing under him took less than ten seconds. The Sportavia pilot stated that they strongly feel that the situation had been resolved by the instinctive mistrust of the other pilot, based entirely on a gut feeling from their radio calls, the wariness that this engendered, and the subsequent SA to know where to look if there was going to be

a threat if they got their positioning wrong, which was the case. The joining aircraft should have been half a mile behind, joining crosswind, not crossing his path halfway along the downwind leg.

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

THE DA40 STUDENT PILOT reports conducting a solo VFR navigation training sortie to Exeter Airport and return, to practise VFR navigation techniques, a Standard Overhead Join (SOJ) and touch-and-go. This was their first solo flight to Exeter, having previously flown a similar sortie dual. The enroute phase of the sortie went as planned. The current airfield and meteorological conditions were obtained from ATIS prior to contacting Exeter Radar, the QNH and ATIS information code was acknowledged on initial contact and a SOJ requested. They were handed over to Tower on entering the Exeter ATZ and arrived at the overhead at 2100ft QNH, tracking north over the threshold markings of RW26 towards the deadside. Shortly after entering the deadside the Tower controller instructed the DA40 student pilot to complete 2 right-hand orbits to allow a twin-engine aircraft to perform a low approach and go-around. The Tower controller was informed once complete and further clearance to continue descending deadside was issued. They levelled at 1100ft at the beginning of the crosswind leg and were passed Traffic Information and instructed to report traffic in sight. The DA40 student pilot recalled that the traffic was in a position to the right but could not recall whether the Tower controller reported the altitude of the other aircraft. The instruction to report traffic in sight was acknowledged and lookout continued but not yet in visual contact. Shortly afterwards, whilst still on the crosswind leg, updated Traffic Information was received, 'about to pass right-to-left', and the DA40 student pilot was asked again whether they were visual. They confirmed traffic in sight just as the other aircraft passed directly beneath, from right to left. There was no time to take avoiding action. They thought the other aircraft had joined downwind. The DA40 student pilot noted that, to the best of his knowledge, the DA40 was fitted with a fully serviceable transponder and a Traffic Awareness System (TAS) which gave audio and visual Traffic Advisories. They could not recall an audio or visual TAS alert. They noted that the workload was high and the focus was to fly the airplane in accordance with the SOJ procedure whilst looking for other aircraft.

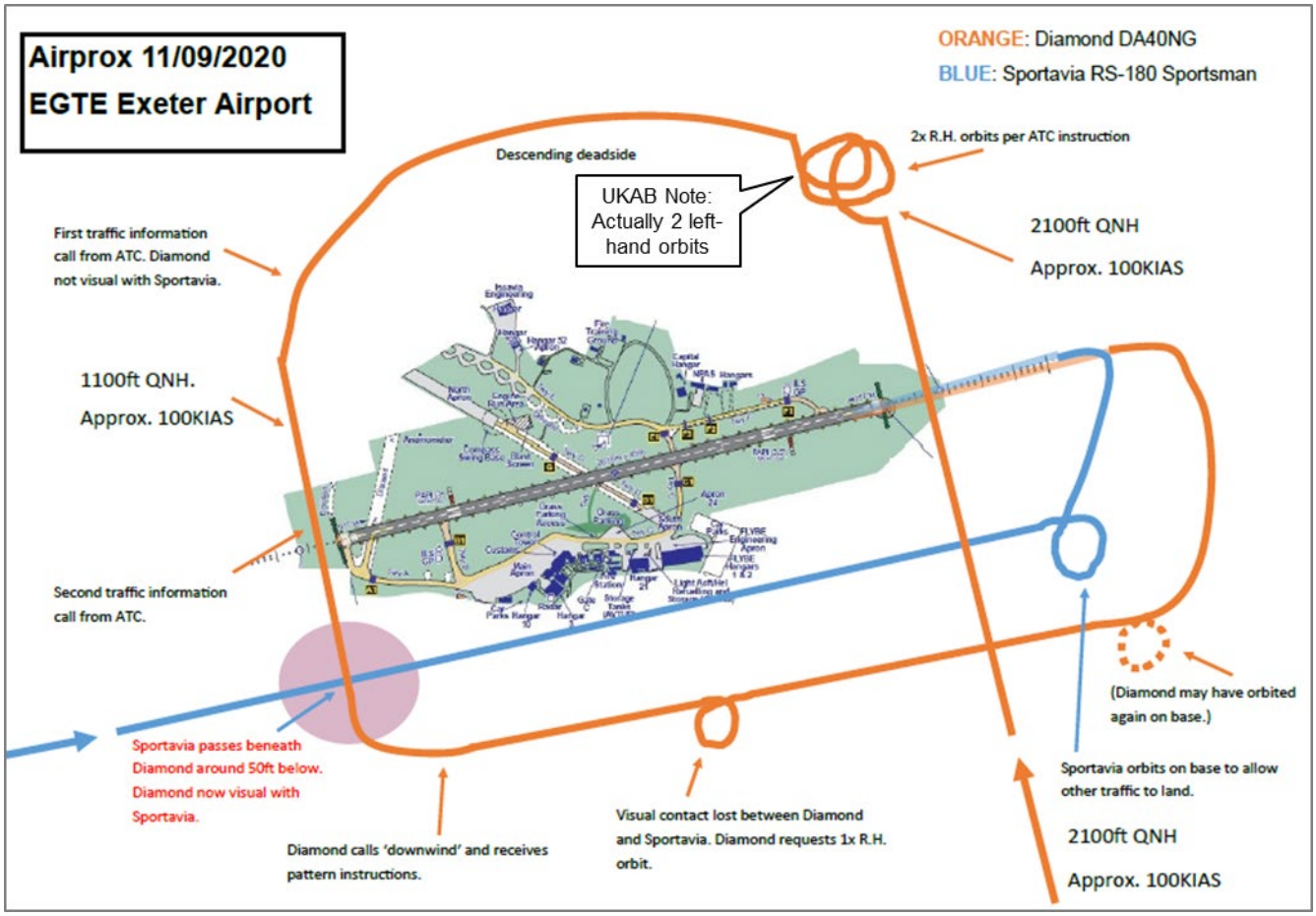


Diagram provided by DA40 pilot

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

THE EXETER TOWER CONTROLLER reports that there were 4 light aircraft in the vicinity of Exeter Airport; a DA42 making a low approach on RW26; a DA40 holding in the overhead for an overhead join; a PA28 joining from the southwest and a Sportavia about 1.5NM behind the PA28. The DA42 was making an instrument approach to go-around with a right turn to the north. The DA40 was given 2 orbits in the overhead to be number 2 to the DA42 and Traffic Information was passed to both pilots. The PA28 and Sportavia subsequently called to join from the southwest; both were given instructions to join left-hand downwind. When the DA40 pilot called orbits complete the DA42 was going around, the PA28 was at the beginning of the downwind leg and the Sportavia 1.5-2NM behind the PA28. The DA42 and DA40 were given Traffic Information on each other's position and the DA40 pilot given information regarding the two light aircraft joining from the southwest. At this point there appeared to be enough space and time to be able to slot the two joining aircraft into the circuit before the DA40. The DA40 pilot turned crosswind earlier than expected at which point the PA28 was late downwind and the Sportavia almost mid-downwind. The DA40 pilot was asked whether he was visual with the second light aircraft (the Sportavia) as it looked from the Tower that he hadn't seen it and was going to join in front. The DA40 pilot hadn't seen the Sportavia, Traffic Information was given on their relative positions and he was instructed to turn right to position behind the Sportavia. As the DA40 pilot had requested a standard overhead join, he expected the DA40 to travel further down the dead side and fit in behind the Sportavia.

Factual Background

The weather at Exeter was recorded as follows:

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METAR EGTE 111420Z 25008KT 9999 OVC032 17/10 Q1017=
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Analysis and Investigation

CAA ATSI

The DA40 pilot made their initial call to Exeter Radar at 1415:12. The controller was busy vectoring a DA42 under a Traffic Service, and so did not answer the DA40 pilot until 1416:06 at which time a Basic Service was agreed, and the runway, QNH and surface wind were all confirmed. The DA40 pilot then requested a "*Standard Overhead Join from the south*" which was acknowledged by the controller (Figure 1).

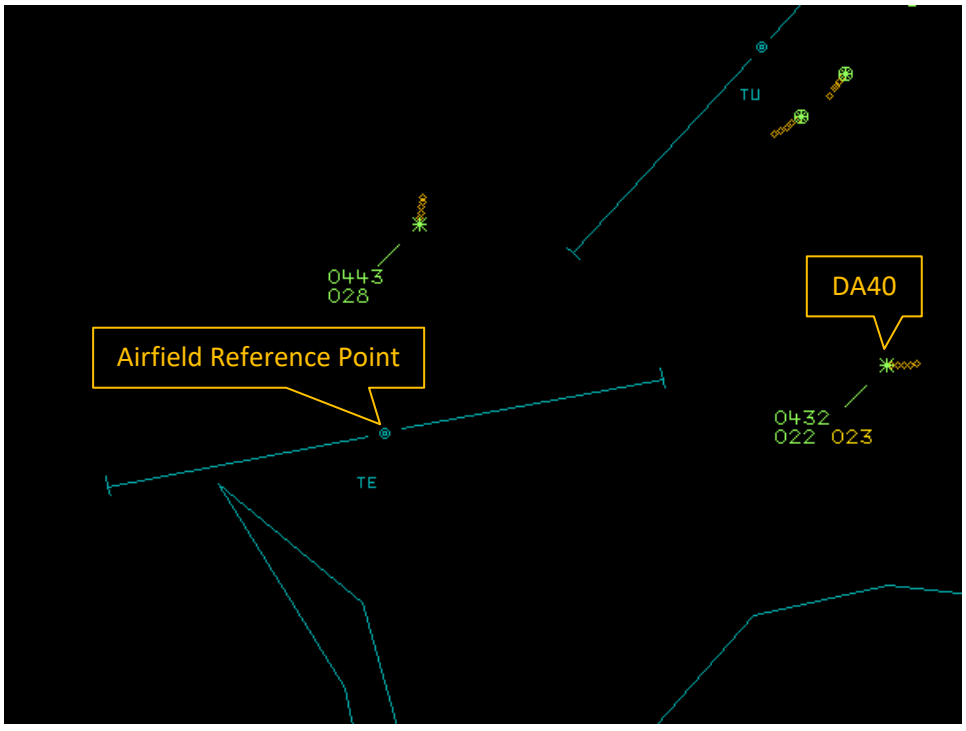

Figure 1 – 1416:06 (radar replay displaying FL – add 100ft for altitude)

At 1417:17, the radar controller confirmed that the DA40 could continue for an overhead join from the south, and went on to pass Traffic Information on an aircraft in transit, north to south through the overhead at 2700ft, all of which was acknowledged by the DA40 pilot (Figure 2).

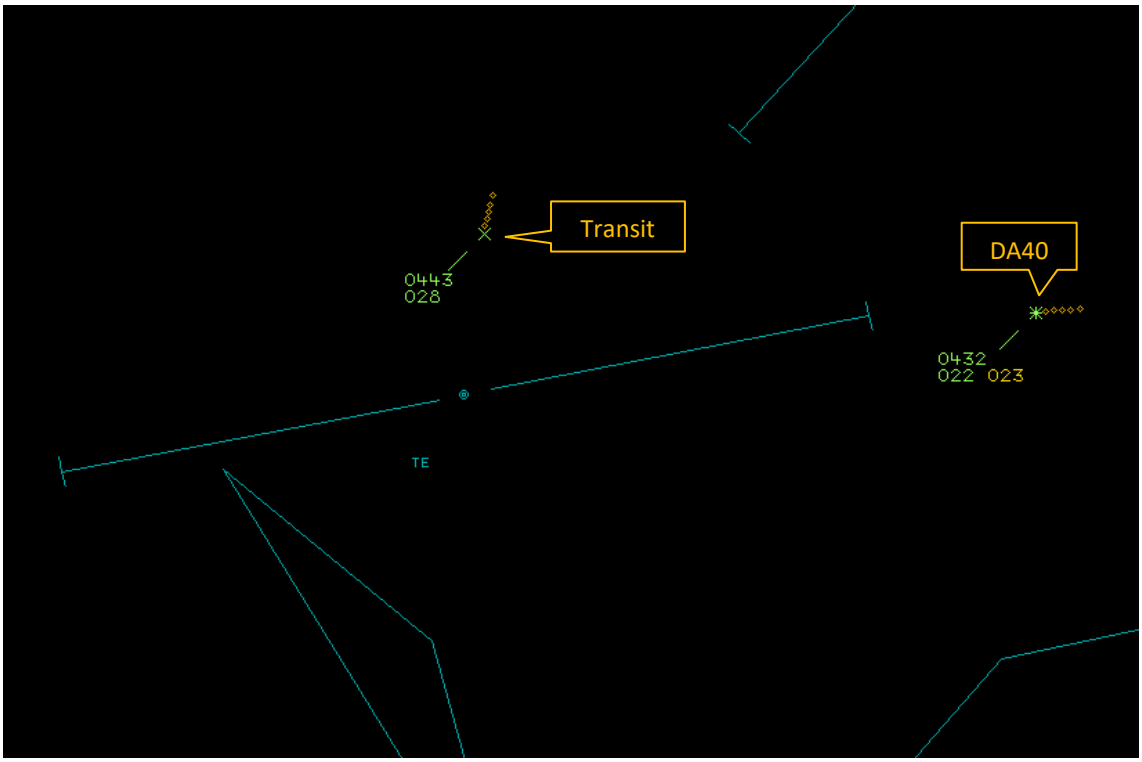

Figure 2 – 1417:17

At 1418:30, the Radar controller asked the DA40 pilot if they had the airfield in sight, which the pilot confirmed they had. The controller updated them on the transit traffic which was now at 2900ft, and instructed them to contact Exeter Tower, all of which was again acknowledged by the pilot (Figure 3).

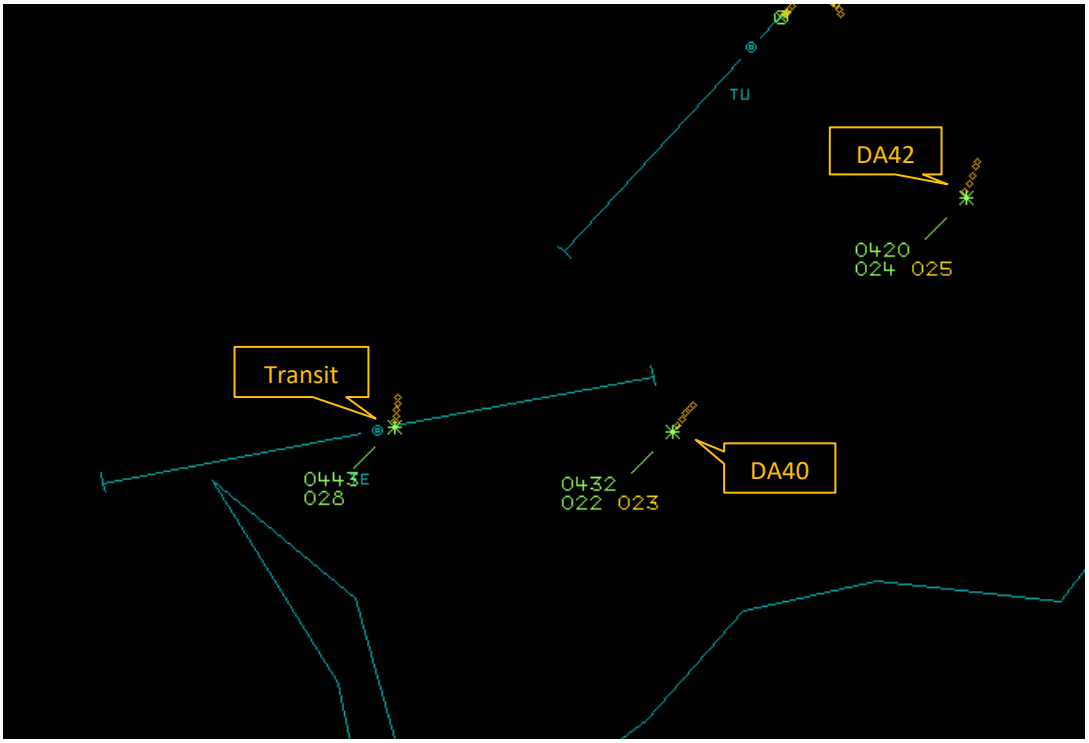

Figure 3 – 1418:30

At 1419:06, the DA40 pilot called Exeter Tower reporting that they were inbound for a standard overhead join from the south. The Tower controller requested they report in the overhead which was acknowledged (Figure 4).

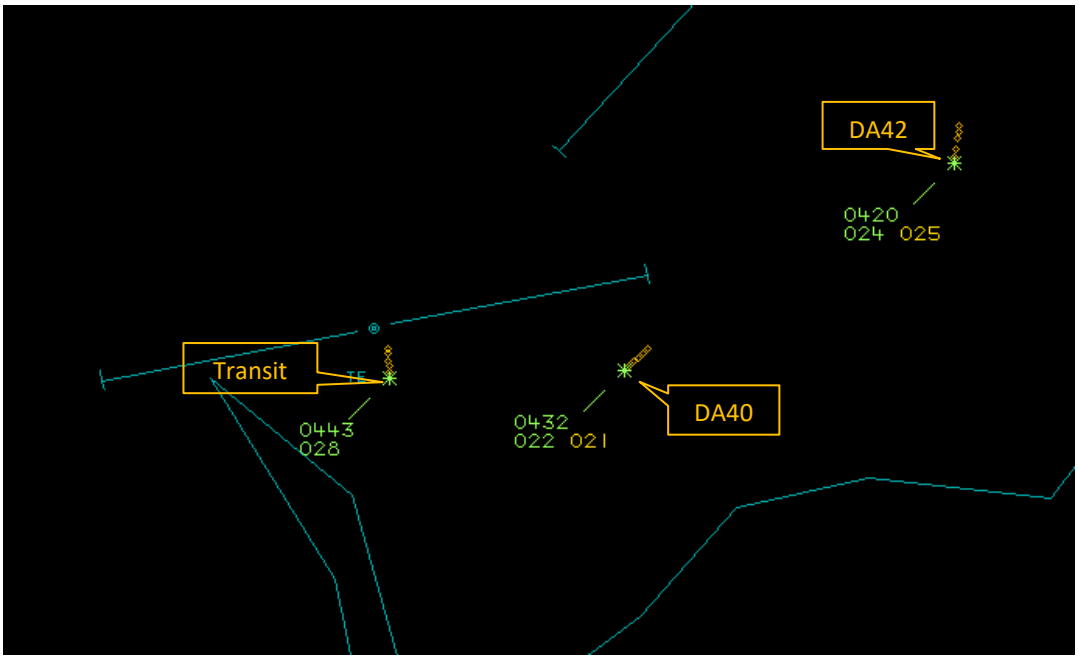

Figure 4 – 1419:06

At 1421:00, the DA40 pilot called the Tower controller, who replied by instructing the pilot to hold in the overhead as there was traffic on a 7NM final, (the DA42), advising they would be Number 2 to that aircraft, which was acknowledged. The DA40 pilot then asked the controller to confirm that it was a left-hand circuit, which the controller did, adding that the descent on the deadside would be to the north of the airfield, which was acknowledged by the pilot (Figure 5).

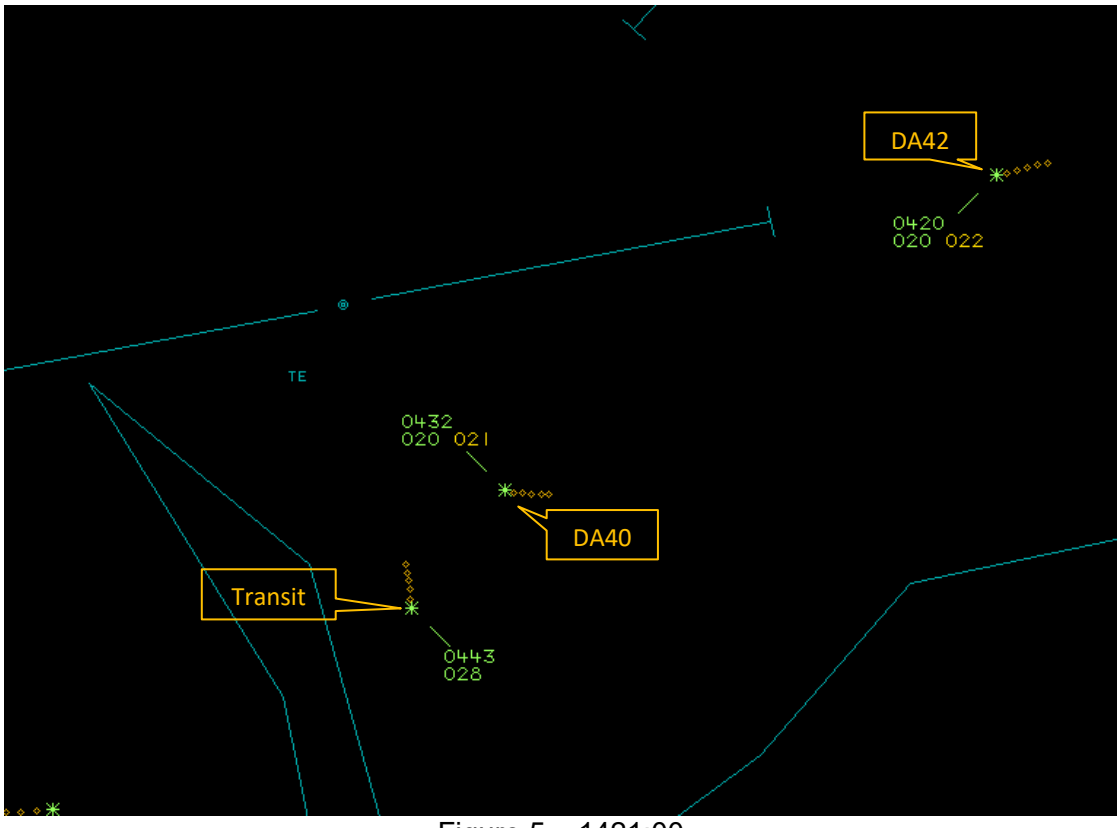

Figure 5 – 1421:00

At 1422:20, the DA40 pilot reported in the overhead. The Tower controller instructed them to carry-out two left-hand orbits *"for spacing while the aircraft on the final approach does his low approach beneath you".* The DA40 pilot acknowledged the orbits but not the Traffic Information. The Tower controller then passed Traffic Information on the DA40 to the DA42 pilot, who was now on frequency, before then clearing them for a low approach (Figure 6).

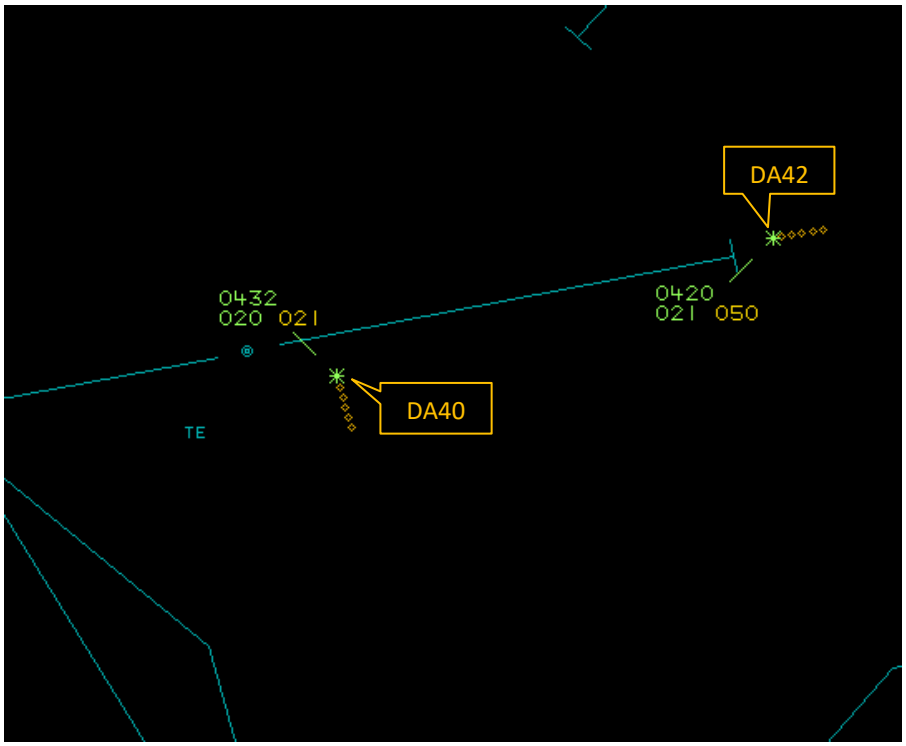

Figure 6 – 1422:20

The Radar controller in the meantime was vectoring a DHC6 in from the southwest and had a PA28 inbound from the south under VFR. At 1423:03, the Radar controller warned-in the PA28 to the Tower controller who confirmed a downwind left-hand join. At 1423:20, the Sportavia pilot called the Radar controller for joining instructions (Figure 7).

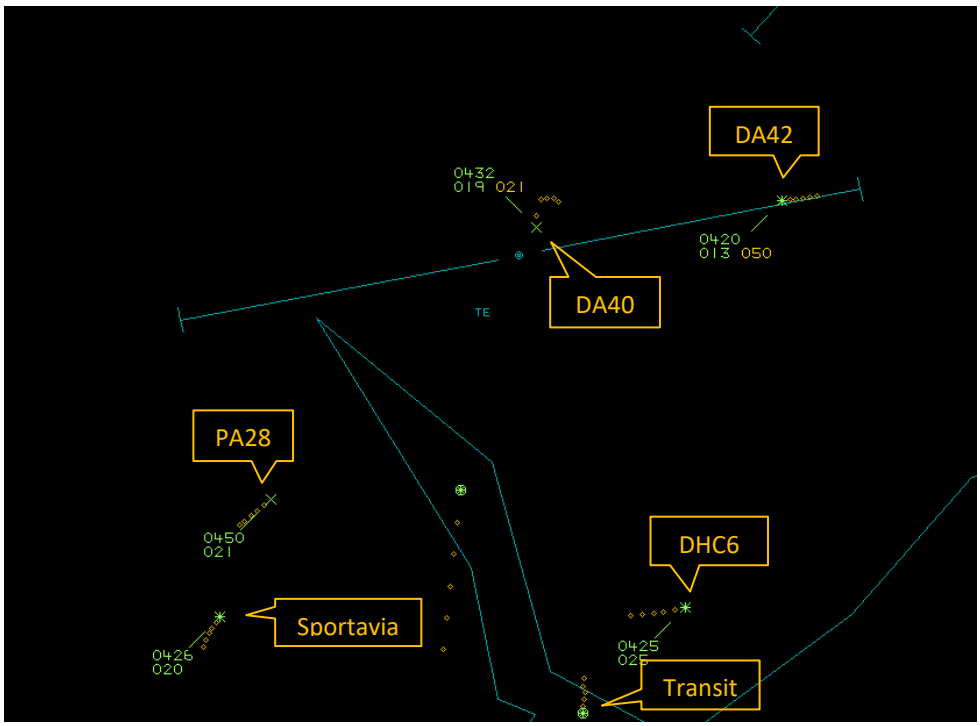

Figure 7 – 1423:20

The Radar controller was on the landline to the Tower controller about the PA28 and did not respond to the Sportavia pilot until 1424:00. They then warned-in the Sportavia to the Tower controller, who again confirmed a downwind left-hand join. The Radar controller informed the Sportavia pilot, passed Traffic Information on the PA28 and instructed them to contact Exeter Tower (Figure 8).

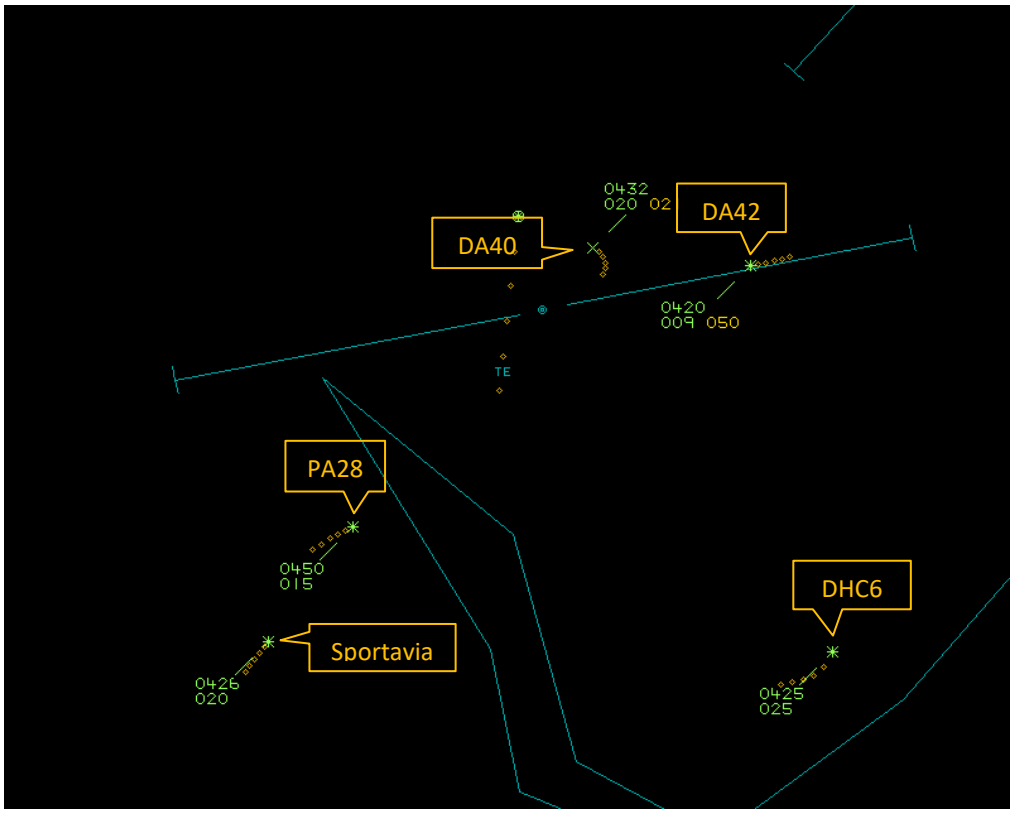

Figure 8 – 1424:00

At 1424:09, the PA28 pilot reported joining downwind to the Tower controller and was instructed to report turning base, which was acknowledged. At 1424:45, the Sportavia pilot contacted the Tower. The Tower controller confirmed the downwind join and the PA28 ahead, and asked if they were visual with that aircraft to which the pilot of the Sportavia stated they were not (Figure 9).

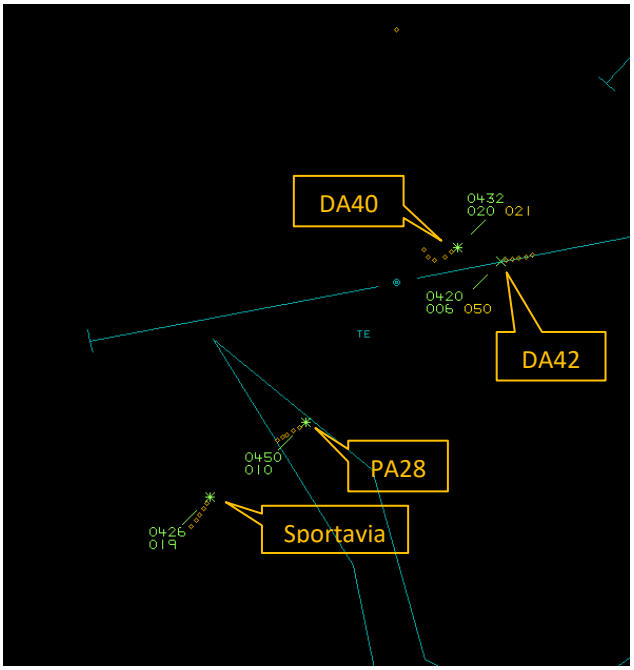

Figure 9 – 1424:45

At 1425:28, the DA40 pilot reported having completed their second orbit and the Tower controller passed Traffic Information on the DA42; *"the overlying aircraft is now overhead the airfield"*. The controller cleared the DA40 pilot to descend dead-side and passed Traffic Information to them on the two aircraft joining from the southwest; *"one mid downwind and one in the vicinity of Topsham"*, (Figure 10).

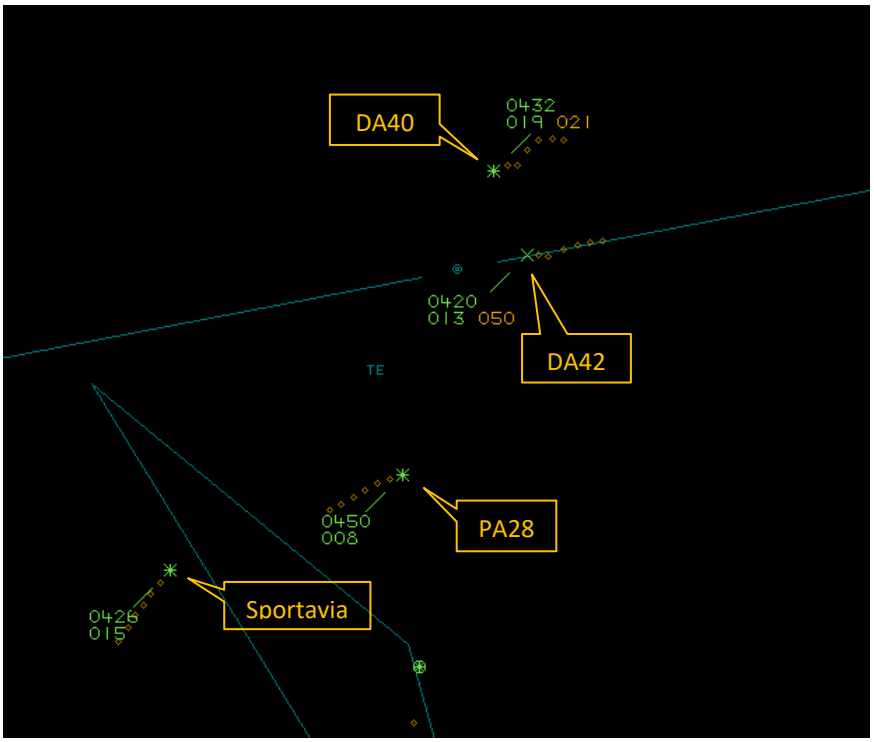

Figure 10 – 1425:28

At 1425:52, the PA28 pilot was instructed to report final as they were No 1, the DA42 having commenced their go-around. At 1426:13, the Tower controller passed Traffic Information to the DA42 pilot on the DA40; "*traffic descending on the dead-side crossing beneath you and behind you is a DA40"*. The DA42 pilot reported visual with the traffic (Figure 11).

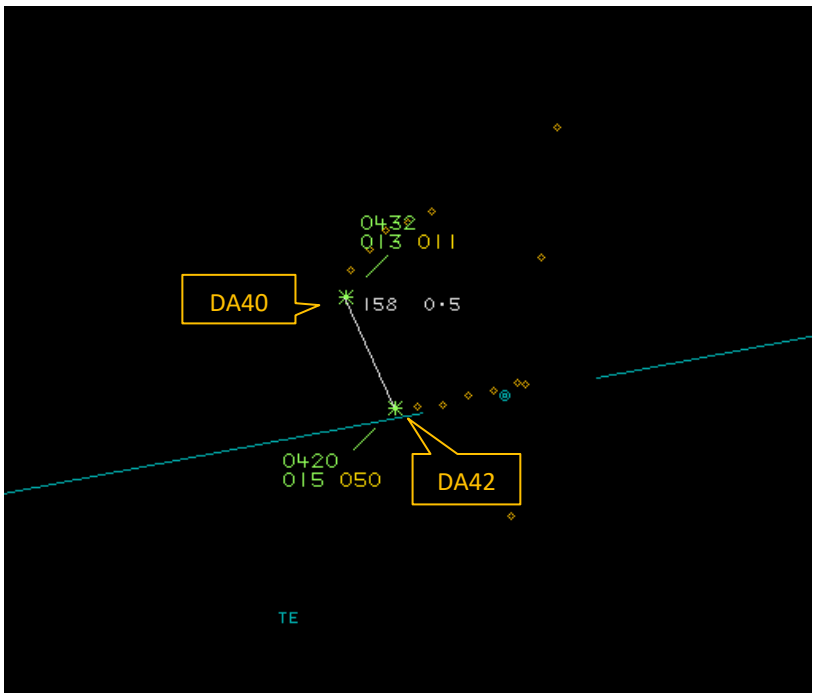

Figure 11 – 1426:13

At 1426:48, the Tower controller asked the DA40 pilot if they were *"visual with the second aircraft*, (the Sportavia), *joining mid downwind",* (Figure 12).

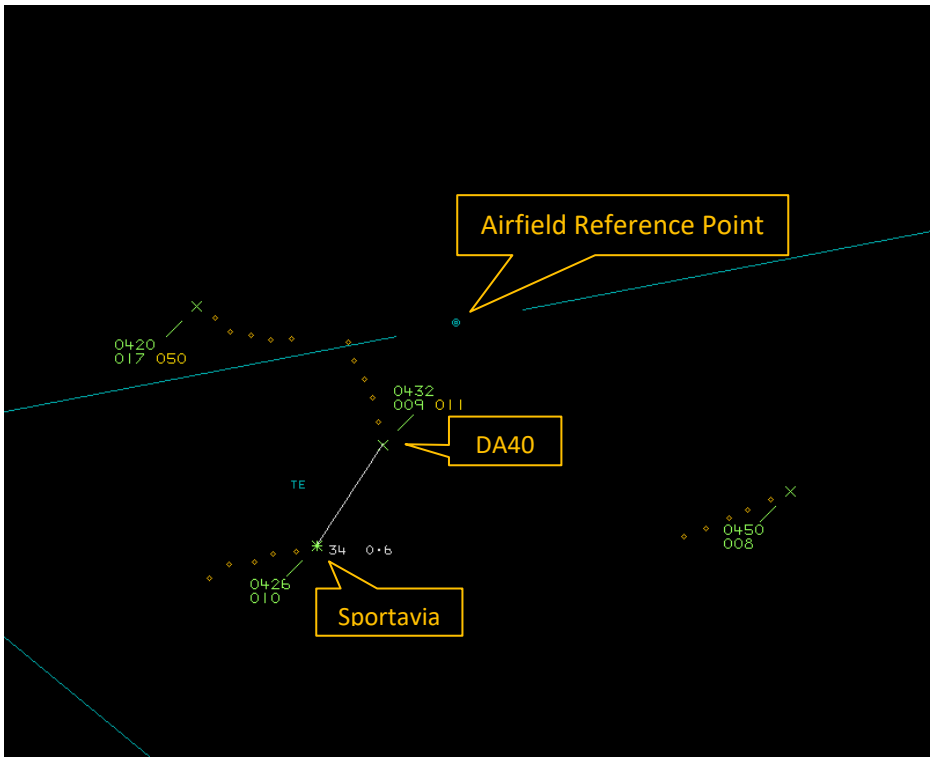

Figure 12 – 1426:48

The DA40 pilot reported that they were not and requested a position update which was given; *"about a half a mile ahead of you, crossing from your right to left"* (Figure 13).

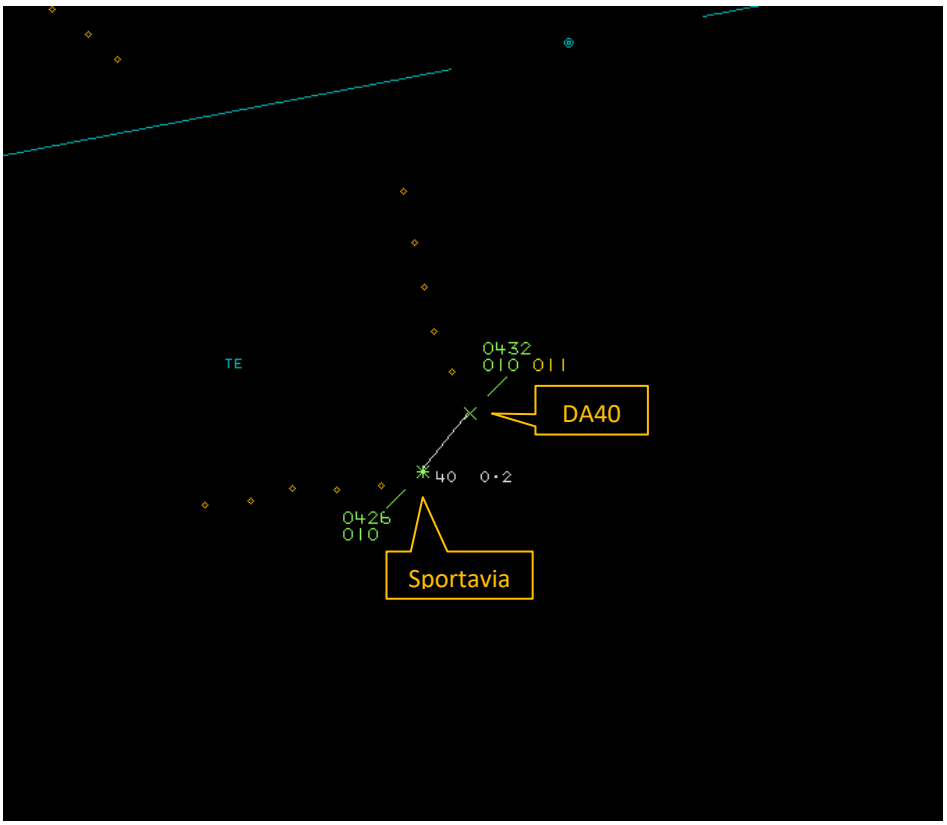

Figure 13 – 1426:59

There were then two simultaneous transmissions before a pilot was heard to say, at 1427:04; *"visual on the, three o'clock low just passing, clear to descend"* which was coincidental with CPA. After that transmission the DA40 pilot then reported visual (Figure 14).

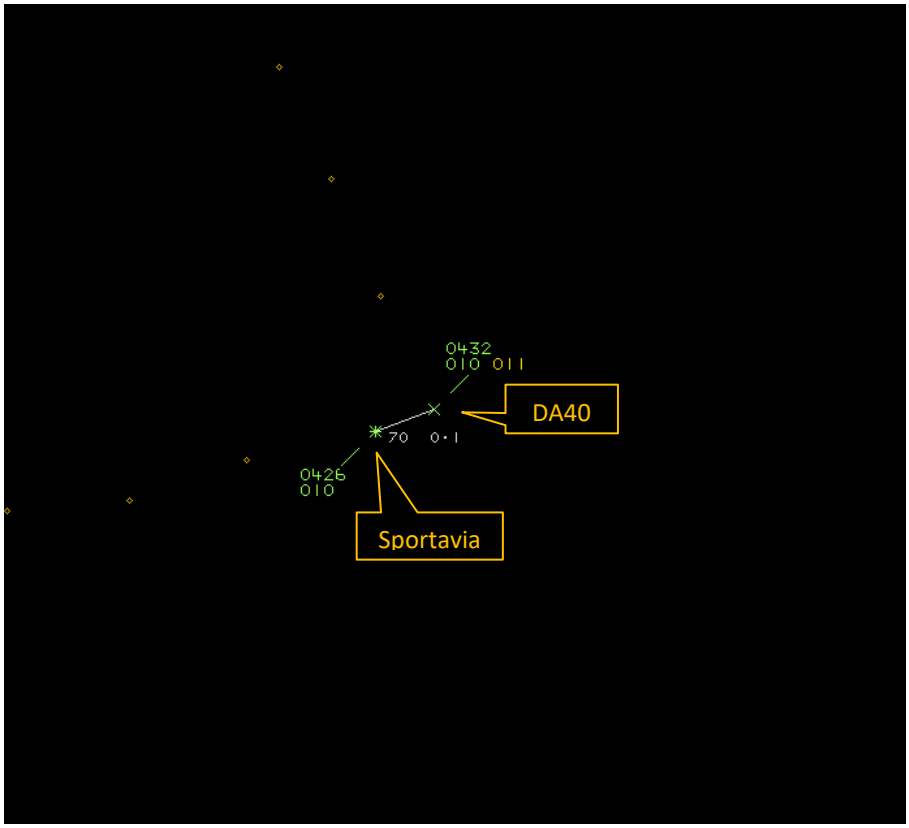

Figure 14 – 1427:04 CPA

ATSI reviewed the radar replay and Exeter RTF, and having the benefit of the whole picture post-incident, it can be suggested that the DA40 could have been brought into the circuit ahead of the DA42 on final approach, and therefore well ahead of the PA28 and Sportavia joining from the south. However, this does the Tower controller a disservice as they were unaware of the impending arrival of the two VFR aircraft from the south, and it was their judgement to make regarding the integration of the DA40 with the DA42. The opportunity to bring in the DA40 from the overhead was subsequently lost with the two VFR joiners and a further inbound being vectored by radar.

Once the Tower controller cleared the DA40 pilot to descend into the circuit, they passed Traffic Information on the DA42 and the two aircraft joining downwind left-hand, although the position report on the second, the Sportavia, in relation to Topsham may not have been fully assimilated because the DA40 pilot was unfamiliar with Exeter.

Exeter ATC advise that the use of the "Standard Overhead Join" is not their standard VFR join, and they expect aircraft to join direct. However, when requested, and where possible, they will try to accommodate an overhead join. The fact that the DA40 pilot, who was inbound from the east, passed through final approach and positioned to the south of the airfield before joining the overhead from there makes no sense from an air traffic management perspective. Further, in this scenario, the DA40 in the overhead then represented a potential confliction with the DA42 on the go around. The DA40 pilot's subsequent crosswind turn appeared to take no account of the DA42, and it is not clear if they were visual with it, although they did report receiving Traffic Information on it whilst in the overhead. The controller was aware of the potential confliction and had passed Traffic Information to the DA42 pilot who reported being visual with the DA40.

In trying to be helpful, the controller unnecessarily increased their own workload, and as a result was having to deal with two potential conflictions, partly due to the positioning of the DA40 from the overhead by a student pilot unfamiliar with Exeter. The subsequent integration of all aircraft

concerned was otherwise well handled. The Airprox took place in Class G airspace where ultimately, regardless of the ATS being provided, the pilots are responsible for collision avoidance.

UKAB Secretariat

The Sportavia and DA40 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]. An aircraft operated on or in the vicinity of an aerodrome shall conform with or avoid the pattern of traffic formed by other aircraft in operation[2]. If an air traffic control unit has communicated to any aircraft an order of priority for landing, the aircraft must approach to land in that order[3]. CAP493 (Manual of Air Traffic Services – Part 1) states as follows[4]:

> 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. In particular, 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.

Exeter Airport Occurrence Investigation

The Exeter Airport Occurrence Investigation found that the incident had been caused because the DA40 pilot did not use the Traffic Information provided by the Tower controller to adjust his path to integrate safely into the circuit traffic, although the reason for that was unknown. The investigation found that a contributing factor had been that the Tower controller was inconsistent in how the traffic sequence was managed and communicated to the DA40 pilot. The Tower controller informed the DA40 pilot that he was 'number 2' to the DA42, carrying out an instrument approach, and held him in the overhead for spacing. However, after Traffic Information was passed on 2 aircraft joining left-hand downwind, the controller cleared the DA40 pilot to descend on the dead side but now expected the pilot to integrate with the joining traffic and sequence himself.

Summary

An Airprox was reported when a Sportavia and a DA40 flew into proximity in the visual circuit at Exeter Airport at 1427Z on Friday 11th September 2020. Both pilots were operating under VFR in VMC, both in receipt of an Aerodrome Control Service from Exeter Tower.

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 reports from the appropriate 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.

[1] SERA.3205 Proximity.
[2] SERA.3225 Operation on and in the Vicinity of an Aerodrome.
[3] The Rules of the Air Regulations 2015, Section 3 (GENERAL RULES, COLLISION AVOIDANCE AND PROTECTION OF PERSONS AND PROPERTY), Order of landing, 9(1).
[4] CAP493, Section 2, Part 7 (Information to Aircraft).

Due to the exceptional circumstances presented by the coronavirus pandemic, this incident was assessed as part of a 'virtual' UK Airprox Board meeting where members provided a combination of written contributions and dial-in/VTC comments.

Members first discussed the ATM aspects of the Airprox and agreed with the Exeter Airport Occurrence Investigation, in that the controller had implicitly sequenced the PA28 and Sportavia ahead of the DA40 without then explicitly managing the DA40 student pilot's sequencing. The last sequencing instruction the DA40 pilot had received was that they were number 2 to a DA42, which had occurred when the DA40 pilot reported in the overhead, about 6 minutes before CPA. Subsequently, the DA42 departed to the north, the PA28 and Sportavia joined visually downwind and the DA40 pilot was cleared to descend on the deadside but no further sequencing occurred (**CF1**). The Board discussed the amount and degree to which Traffic Information was passed by the controller and felt that it had not been sufficient to enable the arriving DA40 pilot to integrate effectively with the Sportavia (**CF3**): when the DA40 pilot was cleared to descend deadside (Figure 10) the Sportavia's position was reported as being in the vicinity of a local VRP, with which the DA40 pilot was probably unfamiliar; when the DA40 pilot was on crosswind the Sportavia's position was reported as 'mid-downwind', to the DA40 student pilot's left, when the Sportavia was in fact to the DA40 student pilot's right, approaching the start of the downwind leg (Figure 12) and finally as the 2 aircraft converged on the live side, the Sportavia's position was reported as 'about a half a mile ahead of you' when the Sportavia was in the DA40 student pilot's right 2:30 position. Members wondered whether the controller's wording was a reflection of the implicit sequencing they were trying to attain. Overall, the Board felt that the controller did not take control of the situation sufficiently to resolve the conflict (**CF2**).

The Board then discussed the pilots' actions. The DA40 pilot was aware that other aircraft were joining downwind and would be to their right on crosswind but continued with their join as directed by the controller, as they were required to do. The Sportavia pilot had formed SA from RTF transmissions that the joining DA40 pilot may not be experienced or adept and had made a mental note to 'take extra care in the circuit if they were going to be there simultaneously'. Board members felt that this improved the situation but also discussed whether the Sportavia pilot could perhaps have made further allowance for the DA40 pilot, perhaps by remaining clear of downwind until the DA40 pilot reported downwind. Members acknowledged that with hindsight this course of action could be contemplated easily but also that the Sportavia pilot had been cleared to join downwind and that an active lookout was being maintaining for the DA40. In the event, it was sighted in a position that was perceived as 'crossing the runway half-way along its length at 90°'. However, it was clear from the radar replay that the DA40 pilot had positioned correctly at crosswind (Figure 12) and had not crossed the airfield at mid-field as perceived by both the Sportavia pilot and Tower controller. The Board felt that both pilots had been operating in the visual circuit, the DA40 in the correct position on crosswind and the Sportavia at the beginning of the downwind leg and, in the absence of further sequencing from the controller, that neither had priority over the other. The Sportavia pilot saw the DA40, perceived that there was no relative motion and therefore that they were on a collision course and took evasive action. Members noted that it remained a pilot's ultimate responsibility, student or not, to avoid collision, and that this was achieved by the Sportavia pilot's action. Some members also felt there may perhaps have been an earlier opportunity for the more experienced Sportavia pilot to improve SA by requesting further Traffic Information on the DA40 as they approached downwind without being visual with it (**CF5**). Some members felt that both pilots had flown into conflict but the Board agreed that they were in an ATC environment where pilots are expected to comply with ATC instructions which are issued as necessary to prevent collisions and to enable safe, orderly and expeditious flight within and in the vicinity of the ATZ . In the event, neither pilot was able to conform with the pattern of traffic (**CF4**) or integrate sufficiently with the other (**CF6**). Members noted that the DA40 pilot had not used the callsign prefix 'STUDENT' with any of their transmissions and felt that if they had done so they would have provided important additional information to assist the controller and other pilots in their appreciation of the situation. Members noted that the DA40 was equipped with a TAS but that the student pilot had reported that they did not recall receiving an audio or visual alert. The Board thought it possible that the TAS may not have alerted as expected but considered it more likely that the DA40 pilot had simply not assimilated the TAS warning (**CF7**).

Turning to the risk, members agreed that the Sportavia pilot had sighted the DA40 at a late stage (**CF9**) and that the DA40 pilot had seen the Sportavia at such a late stage that separation could not be materially increased, effectively a non-sighting (**CF9**). The pilots' reports and the radar picture indicated that the aircraft had passed in very close proximity (**CF8**) and the Board members agreed that in this case safety had been much reduced.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2020136		
CF	**Factor**	**Description**	**Amplification**
	Ground Elements		
	• Regulations, Processes, Procedures and Compliance		
1	Human Factors	• ATM Regulatory Deviation	Regulations and/or procedures not complied with
	• Situational Awareness and Action		
2	Human Factors	• Conflict Resolution- Inadequate	
3	Human Factors	• ANS Traffic Information Provision	TI not provided, inaccurate, inadequate, or late
	Flight Elements		
	• Tactical Planning and Execution		
4	Human Factors	• Monitoring of Other Aircraft	Did not avoid/conform with the pattern of traffic already formed
	• Situational Awareness of the Conflicting Aircraft and Action		
5	Human Factors	• Lack of Communication	Pilot did not request additional information
6	Human Factors	• Monitoring of Other Aircraft	Pilot did not sufficiently integrate with the other aircraft
	• Electronic Warning System Operation and Compliance		
7	Technical	• Interpretation of Automation or Flight Deck Information	CWS alert expected but none reported
	• See and Avoid		
8	Contextual	• Near Airborne Collision with Aircraft, Balloon, Dirigible or Other Piloted Air Vehicle	Piloted air vehicle
9	Human Factors	• Monitoring of Other Aircraft	Non-sighting or effectively a non-sighting by one or both pilots

Degree of Risk: B.

Recommendation: Nil.

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:

Regulations, Processes, Procedures and Compliance were assessed as **ineffective** because the Exeter Tower controller did not sufficiently sequence the circuit traffic.

Situational Awareness of the Confliction and Action were assessed as **partially effective** because the conflict between the DA40 and Sportavia was not resolved by passing Traffic Information to the DA40 student pilot.

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

Flight Elements:

Tactical Planning and Execution was assessed as **partially effective** because neither pilot was able to conform with the pattern of traffic or integrate with the other in the visual circuit.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **partially effective** because neither pilot assimilated the available SA in a timely manner.

Electronic Warning System Operation and Compliance were assessed as **ineffective** because the DA40 TAS either did not alert as expected or the DA40 student pilot did not assimilate a TAS alert.

See and Avoid were assessed as **partially effective** because the DA40 pilot did not see the Sportavia in time to take avoiding action and the Sportavia pilot only saw the DA40 at a late stage.