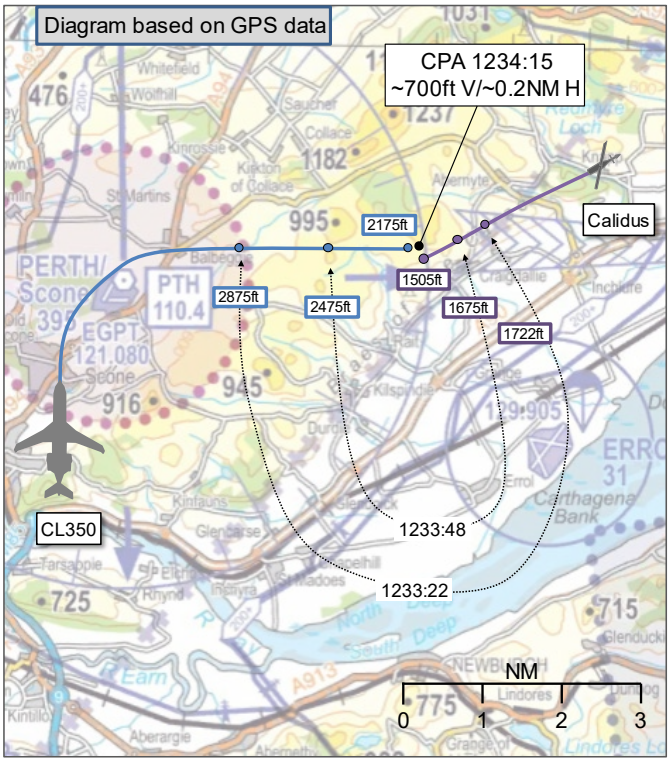
AIRPROX REPORT No 2024248

Date: 29 Sep 2024 Time: 1234Z Position: 5627N 00314W Location: 7NM W Dundee

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	CL350	Calidus
Operator	Civ Comm	Civ Helo
Airspace	Scottish FIR	Scottish FIR
Class	G	G
Rules	IFR	VFR
Service	Procedural	None
Provider	Dundee Tower	N/A
Altitude/FL	~2175ft	~1500ft
Transponder	A, C, S+	A, C, S
Reported		
Colours	Grey	Red
Lighting	'Standard'	'Yes'
Conditions	IMC	VMC
Visibility	5-10km	5-10km
Altitude/FL	2900ft	1500ft
Altimeter	QNH	QNH (1019hPa)
Heading	092°	210°
Speed	180kt	70kt
ACAS/TAS	TCAS II	SkyEcho
Alert	TA	None
Separation at CPA		
Reported	Not Seen	1000ft V/300m H
Recorded	~700ft/0.2NM	



THE DUNDEE CONTROLLER reports that this incident was originally ECCAIRS filed as a go-around by the CL350 from final approach RW09 at Dundee, due to the close proximity of an unknown gyrocopter. Following the initial report, it was decided this warranted reporting as an Airprox for further investigation. The CL350 was coordinated inbound directly with Scottish Control Tay Sector for an RNP approach to RW09 via ABDED. Leuchars LARS was unavailable at this time. Coordination was effected with Perth Radio, who informed them of traffic in their RW09 left hand circuit and one aircraft joining from the north, not relevant to this report. At 1230 [CL350 C/S] was established on the RNP at ABDED and was asked to report passing the final approach fix. Having done so they were subsequently cleared to land. Shortly thereafter, while trying to obtain visual contact with [the CL350] using binoculars, they saw a gyrocopter approaching the RW09 extended centreline from the north. The aircraft appeared to be tracking north-to-south, approximately between 1000ft and 1500ft at approximately 4-5 miles range. The gyrocopter was not known to them before they acquired it visually and was not working the Dundee frequency. They began to pass traffic [information] to the Challenger pilot and, as they did so, the aircraft simultaneously broke cloud and initiated a go-around due to the unknown traffic showing on their TCAS display straight ahead. They issued missed approach instructions and called Perth Radio again to ask if they had any knowledge of the gyrocopter. The AGO said the gyrocopter had made their initial call just as [the Dundee controller] had contacted them to enquire about it. The Challenger pilot conducted a missed approach back to the DND NDB, then made an uneventful RNP approach again via ABDED, landing at 1249. After landing, they asked the crew if they had had a TCAS TA or RA. They said the unknown gyrocopter was showing no height information on their TCAS display, but they had elected to go around as they were in cloud and were unsure of the other aircraft's altitude. Having acquired both aircraft visually they would estimate their separation to be between 4-600ft vertically, with no lateral separation. At that point on the RNP procedure the inbound aircraft's profile would have them descending from altitude 2500ft at 7.7NM, to altitude 1300ft at 4NM and then to the surface. They estimated the closest point of approach was at approximately 4-5 miles, with the gyrocopter at around 1000ft to 1500ft and the Challenger between 1800ft and 2200ft.

The controller perceived the severity of the incident as 'High'.

THE CL350 PILOT reports that they were warned by ATC about the presence of multiple light-aircraft on the approach area, showing only in primary radar. They were cleared for the RNP RW09. They established at 2500ft on the final approach course with flaps 10, TCAS showed a TA on the nose at 3NM. At the FAF they began descent on the glidepath, flying IMC. At around 6NM from the threshold and at 1800ft the TA remained, so the crew decided to execute a go-around to prevent flying towards the contact without the visibility to avoid a possible encounter. The missed approach was performed normally and they requested to proceed for a new approach, which was completed with no issues and with a safe landing.

THE CALIDUS PILOT reports that they left [departure airfield] for a local flight which was conducted to the north/northeast as planned. On the route back, on heading 270°, they changed to 210° due to a skein of geese. They then turned back to 270° on spotting the other aircraft. At approximately 6NM to the east of Perth, when ready to change onto the Perth frequency, they met the other aircraft, they first saw it about 1NM away and they turned to the right to avoid.

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

Factual Background

The weather at Dundee was recorded as follows:

```
METAR EGPN 291220Z 09005KT 9999 FEW008 12/08 Q1018=
METAR EGPN 291250Z 08004KT 9999 SCT038 13/09 Q1018=
```

Analysis and Investigation

Unit Occurrence Investigation

Background

The Challenger CL350 was carrying out an RNP Approach procedure to RW09 at Dundee. Once the pilot reported passing the Final Approach Fix, ATC cleared the aircraft to land. After this point the controller attempted to establish visual contact with the aircraft and while doing so observed what appeared to be a gyrocopter approaching the RW09 extended centreline from the north. The aircraft appeared to be at an altitude of 1000-1500ft and approximately 4-5 miles to the west of Dundee. The controller began to pass Traffic Information on the gyrocopter to the CL350 pilot, but at that point the aircraft broke cloud and [the pilot] initiated a go-around. The gyrocopter was not in RT communication with Dundee ATC at the time, and it was understood that the pilot established RT communication with Perth A/G shortly after this incident. After commencing the go-around, [CL350 C/S] commenced another RNP approach to RW09 and landed with no further issues. After landing, the controller asked if the crew received any TCAS alerts and they stated that the aircraft was evident on their TCAS display but was not showing any altitude information and therefore the crew elected to commence a go-around as they were in cloud and at that point were unsure of the other aircraft's altitude. The Dundee controller estimated that the separation between the two aircraft at its closest point was approximately 400-600ft vertically and nil lateral separation.

Sequence of Events

1130: ATCO at time of incident took over watch.
1220: Scottish TAY Sector co-ordinated inbound [CL350 C/S] with Dundee ATC. Aircraft co-ordinated to route to ABDED at 3400ft Dundee QNH 1018, for the RNP procedure RW09.
1227: Dundee ATC co-ordinated [CL350 C/S] with Perth A/G. Perth advised Perth circuit active and one aircraft inbound Perth from the north.
1229: [CL350 C/S] established RT communication with Dundee ATC. Crew reported descending to altitude 5000ft QNH 1018.

1230: Dundee ATC cleared [CL350 C/S] for RNP Approach RW09 via ABDED.
1231: Crew of [CL350 C/S] reported passing ABDED.
1233: Dundee ATC cleared [CL350 C/S] to land RW09.
1234: Dundee ATC passed Traffic Information to [CL350 C/S] on unknown gyrocopter observed crossing ahead of their path.
1234: Crew of [CL350 C/S] informed Dundee ATC that they had traffic on TCAS and were commencing a go-around.
1235: Dundee ATC contacted Perth A/G by telephone to enquire about possible autogyro on their frequency. Perth A/G advised that an autogyro has just contacted them.
1249: [CL350 C/S] landed RW09 following second RNP approach.

Analysis

Prior to [CL350 C/S] establishing communications with Dundee ATC, the Dundee controller had accepted a co-ordination call from Prestwick Centre (TAY Sector) for the aircraft to route to ABDED for the RNP Approach RW09. Leuchars LARS was not operating at the time of the incident due to standard weekend closure. The Dundee controller had cleared [CL350 C/S] for the RNP Approach RW09 via ABDED and once the pilot reported passing the Final Approach Fix the aircraft was cleared to land. At this point the controller used the binoculars in an attempt to visually acquire [CL350 C/S] on final approach. The [CL350 C/S] would have been on about a 7-mile final and starting descent from 2500ft AGL. [CL350 C/S] could not be seen at that point but the controller did observe an unknown aircraft, which they estimated to be at an altitude of 1000-1500ft AGL, passing approximately 4-5NM west of the airfield north-to-south. This aircraft was not known to Dundee ATC and therefore the controller began to pass Traffic Information about this unknown aircraft to the CL350 [pilot]. As this information was being passed, [CL350 C/S] broke cloud and the crew elected to commence a missed approach due to the other aircraft. The controller was able to ascertain that the unknown aircraft was an autogyro and telephoned Perth ATC to ask if they knew of any autogyros operating within the area. The AGO at Perth answered by saying that one had only just called Perth A/G to the east of Perth requesting rejoin. From this conversation the registration of this aircraft was established. It was fortuitous that while the controller was trying to visually locate the inbound CL350, they observed the autogyro and were able to provide some details to the crew to assist with avoiding the aircraft. This was the only course of action available to the controller at this time.

As per the Letter of Agreement between Dundee ATC and Perth Air/Ground, it is Dundee ATC's responsibility to contact Perth ATC prior to an aircraft carrying out an instrument approach onto RW09 at Dundee, to ascertain if Perth have any traffic in the vicinity. On this occasion this was completed by Dundee ATC and the Perth AGO stated that they had circuit traffic on RW09 left hand and one aircraft joining from the north. This aircraft joining was not the Calidus gyrocopter. In fact, the pilot only contacted Perth A/G immediately prior to the Dundee controller telephoning Perth ATC to enquire about an autogyro, which was 2min after the incident occurred. In this instance, there was nothing else the Perth AGO could have done to prevent the incident.

[CL350 C/S] was on an IFR flight-planned flight from [departure airfield] to Dundee. In a brief report, the commander of the aircraft stated that they had been, "Warned by ATC [Scottish Control] about the presence of multiple light traffics on the approach area with just primary radar……At around 6NM from threshold and 1800ft the TA remained there so crew decided to execute go-around to prevent keep flying to the contact with no visibility enough to avoid a possible encounter." The crew of [CL350 C/S] elected at the time that the safest option was to carry out a go-around and climb in order to avoid the aircraft. It was not stated if the Traffic Information passed to them by Dundee ATC assisted in their decision-making process. The miss distance between the [CL350 C/S] and the autogyro could not be accurately assessed, however, it is approximated to have been between 300ft-800ft vertically and 0.5NM-1NM horizontally.

In response to a request for information concerning the incident, the pilot of the Calidus stated that they had conducted a local flight and changed frequency to an air-to-air frequency of 123.45MHz, on which the pilot remained for the duration of the flight, before contacting Perth A/G to request

joining instructions. Routeing to Perth on a heading of 270° they altered course to 210° due to a skein of geese. The pilot stated that they were at approximately 1500ft (QNH 1019) as they passed west of Dundee, and that they spotted the other aircraft [CL350] and made a turn to the right onto a heading of 270° to avoid this aircraft, but also kept a continuous eye on the aircraft for as long as possible. When approximately six miles to the east of Perth airport they contacted Perth A/G for rejoin. The pilot stated that they were aware of the instrument approach procedure at Dundee Airport and when asked if there was any reason why they did not contact Dundee ATC they replied, no.

As part of this investigation a review of tracking data from website FlightRadar 24 was observed and it purports to show that at approximately 1208 the Calidus was operating in the vicinity of Arbroath and then routed south along the coast passing East Haven where the aircraft turned west to route north of Carnoustie and north of Dundee by approximately 4NM. At this point the aircraft turned west-southwest to pass just to the east of Piperdam Loch (4.3NM NW of Dundee Airport). Here the aircraft appeared to route southwest towards Perth City and passed due west of Dundee by approximately 6NM at its closest point. At this point, data showed the aircraft was at approximately 1225ft AGL. Also, as part of this investigation only, the record of the aircraft's flight was obtained from website ADSB-Exchange. This indicated that at the time of the incident the aircraft was transmitting a transponder code of 7000 (conspicuity code) and the signal the website was picking up was an MLAT (multilateration) source.

Dundee's instrument approaches are located outside controlled airspace. The RNP procedure for RW09 extends out to a point 12.9NM to the southwest of Dundee Airport and the procedure takes the aircraft just to the west and north of Perth Airport. CAA publication CAP1535 The Skyway Code states that:

> VFR traffic operating near aerodromes outside controlled airspace should be aware that there may be IFR traffic using IAPs and should avoid crossing them at similar altitudes to that of the procedure, unless talking to the relevant ATSU. IAPs outside controlled airspace are indicated by 'feathered arrows'. Note the feathers only align with the main instrument runway. There may also be approaches to other runways. Pilots are recommended to contact the aerodrome ATSU if flying within 10NM of an aerodrome marked with IAP feather.

At the approximate point of the Airprox, [CL350 C/S] would have been on a continual descent from 2500ft Dundee QNH.

In a previous Airprox Investigation Report, 28 August 2024 (Airprox 2024223), it was ascertained that some pilots based at airfields situated around Dundee were deciding not to contact Dundee ATC when transiting, due to the perceived notion that they would be charged for the service provided because of an 'Air Navigation Service Fee' published on the HIAL website. Following the above investigation, HIAL has provided a full definition of this fee and who exactly it would apply to. It confirms that it would not apply to any aircraft that was only transiting past a HIAL airport and in receipt of a service from that unit such as a Basic or Procedural Service. This was published on the HIAL website on 01 October 2024. There is no evidence to suggest that this was a contributing factor in this incident.

The letter of agreement between Dundee ATC and Perth Air/Ground states that one of the responsibilities of Dundee ATC is that:

> Whenever the Perth ATZ is notified as active, for the purposes of this agreement the published hours of operation constitute notification, the Dundee Duty ATCO will contact Perth A/G operator on [telephone number] to give warning of any traffic about to go out-bound from the DND with the intention of following an IAP or traffic intending to conduct an RNP procedure for RW09 at Dundee. This shall include the aircraft type and any other pertinent information.

The LOA also states that the Perth Air Ground Operator is responsible for:

> Upon receipt of a call from Dundee ATC regarding an imminent use of the Dundee IAP under the criteria outlined above, advise Dundee ATC of any traffic that may have direct relevance to the Dundee instrument

> traffic. Then make a general broadcast to any traffic in the vicinity of Perth operating on 121.080MHz notifying them of the Dundee traffic.

And:

> Whenever the Perth A/G operator is aware of or has reason to believe that an aircraft may be pertinent traffic to aircraft carrying out the IAPs or RNP approaches into Dundee, with particular reference to aircraft known or suspected to be conducting the non-approved Perth IAP, then they should telephone Dundee ATC as a matter of operational urgency to advise them of the presence of that traffic so that deconfliction measures can be effected. Perth A/G will endeavour to confirm with aircraft operating on their frequency which may be transiting in close proximity to the Dundee ATZ or instrument approaches, that the aircraft has contacted Dundee ATC for any traffic information.

In this incident the members of staff from both units followed the requirements of this Letter of Agreement.

Dundee ATC is not provided with any form of electronic equipment that would enable the controller to observe the position an aircraft in flight. The use of third-party websites such as FlightRadar 24 and ADS-B Exchange cannot be used in an operational capacity by ATC. Several HIAL airports, including Dundee, are in the process of being equipped with a Flight Information Display System (FIDS) which utilises ADS-B signals from appropriately equipped aircraft and displays their position on a screen. This would not be a tool for the control of aircraft but to be used by the controller to improve their situational awareness of aircraft within the vicinity. At present Dundee is yet to receive the appropriate equipment and as of yet no ATCOs from any HIAL unit have undergone any form of training on the new equipment. In any case, this would not have assisted the controller in this incident as [Calidus C/S] was transmitting its position via MLAT rather than ADS-B and, as such, would not have been displayed by the proposed FIDS.

The [CL350 C/S] aircraft was equipped with ACAS and the crew was receiving notification from this equipment of the potential threat posed by [Calidus C/S]. The crew of [CL350 C/S] stated that they only received Traffic Advisories (TAs) during the incident and that they were not made aware of the altitude of the other aircraft.

The only area of airspace at Dundee is the Aerodrome Traffic Zone (ATZ). This is a defined area consisting of a circle radius 2NM from the midpoint of the runway and extending from the surface to 2000ft AGL. The Dundee ATZ is classified as Class G airspace but is governed by Rule 11 of the Rules of the Air Regulations 2015. This rule states that:

> (2) An aircraft must not fly, take off or land within the aerodrome traffic zone of an aerodrome unless the commander of the aircraft has complied with paragraphs (3), (4) or (5), as appropriate.
> (3) If the aerodrome has an air traffic control unit the commander must obtain the permission of that unit to enable the flight to be conducted safely within the aerodrome traffic zone.

When aircraft are operating within the ATZ, they have a certain amount of protection as this is a known traffic environment, however, compared to the overall approach area the aircraft must fly on an instrument approach into Dundee, this area is miniscule. Much of the approach segment is flown in open FIR under Class G and therefore aircraft are generally operating under the “see and be seen rule” and are not obliged to contact any ATC unit. As stated previously, pilots should be aware of any unit that has an instrument approach outside controlled airspace and pilots should avoid crossing them at similar altitudes to that of the procedure, unless talking to the relevant ATSU. However, this is not obligatory and relies on the airmanship of the individual. It has been commented in the past by ATC staff that any airport such as Dundee that provides an Air Traffic Control Service and has published instrument approach procedures should have some form of larger controlled airspace protecting aircraft operating on these approaches. This would serve as a form of “boundary fence”. This of course would not rule out completely any possible infringement and incident, however, it would certainly lessen the chances of this happening. It is to be noted that the pilot of the Calidus did not enter the Dundee ATZ but was not in RT communication with Dundee ATC and

was operating at a similar altitude to an aircraft operating on any of the published instrument approaches to RW09.

Dundee weather; although the METAR observations for around the time of the incident gave the cloud as FEW008 and SCT038, there was likely to be more cloud to the west of the airport as the crew stated that they were still IMC when they started their descent from 2500ft, and the Dundee controller stated that when they started to pass Traffic Information the aircraft suddenly 'broke cloud'. Taking into consideration the reports from the crew of [CL350 C/S] this would indicate that the lower levels of cloud to the west of Dundee were at around 1800ft. This would have likely prevented the pilot of the Calidus from transiting the area at an altitude significantly above the published instrument approach levels.

Conclusion

The Airprox was caused by the pilot of the Calidus flying through the instrument approach area for RW09 at Dundee while a CL350 was operating in accordance with the RNP instrument approach. The Calidus pilot was operating in accordance the Rules of the Air in that they were flying in Class G FIR and did not penetrate the Dundee ATZ. However, the pilot was aware of the existence of the instrument approach procedures at Dundee and elected to fly within this area without establishing RT contact with Dundee Approach. This goes against the recommendations by the CAA that pilots should contact the appropriate ATS facility if operating within 10NM of an aerodrome that has an instrument approach procedure outside controlled airspace. If the pilot had established communication with Dundee or even Perth, prior to passing to the west of Dundee they could have informed the pilot about the aircraft operating on the RNP. Dundee ATC had previously carried out a safety presentation to pilots based at Perth Aerodrome, highlighting the type of air traffic movements at Dundee Airport and the importance of contacting Dundee ATC in the event of requiring to transit past Dundee. This presentation was well received and therefore it is to be recommended that another safety presentation be offered to Perth Airport in order to reinforce the importance of communicating with Dundee ATC.

Recommendation 1 - Dundee ATC contact the operators of Perth Airport and ascertain if a presentation by Dundee ATC highlighting the operation and ATC services available from Dundee ATC would be advantageous.

For airports that have a published instrument approach procedure outside controlled airspace, the dimensions of an ATZ do not offer any form of protection to aircraft carrying out instrument approaches, as the vast majority of the approach procedure is outside the ATZ. The CAA does advise pilots flying in the vicinity of aerodromes with instrument approaches outside controlled airspace to contact the appropriate ATC unit and to fly at a significantly different level to that of the approach procedure when crossing, however, there have been a number of incidents at Dundee whereby this advice has either not been followed, or has not helped. Therefore, it will be a recommendation that HIAL investigates the establishment of a larger area of controlled airspace, in order to provide enhanced protection to aircraft carrying out instrument approach procedures at Dundee.

Recommendation 2- HIAL to investigate the establishment of controlled airspace around Dundee Airport and its associated instrument approach procedures, in order to enhance the protection of aircraft carrying out instrument approach procedures.

UKAB Secretariat

An analysis of the NATS radar was undertaken. At 1230:35 the CL350 could be seen 15NM southwest of Dundee, indicating FL066, in the descent. The Calidus could be seen 4NM northwest of Dundee indicating FL011 (Figure 1).

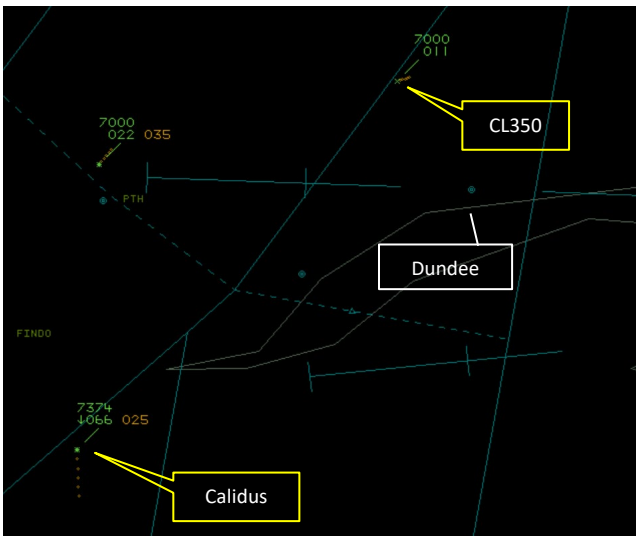


Figure 1 – 1230:35

At 1231:54 the Calidus faded from radar contact on the NATS radars (Figure 2) and did not re-appear until after the Airprox.

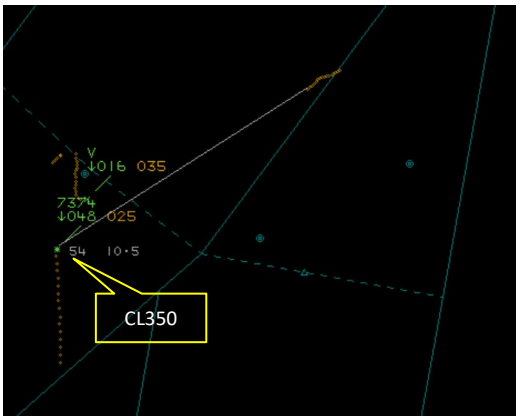


Figure 2 – 1231:54

An on-line flight tracking tool was also assessed and both aircraft could be seen throughout, therefore the diagram at the top of the report was constructed using this.

The CL350 and Calidus 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] If the incident geometry is considered as converging then the Calidus pilot was required to give way to the CL350.[3]

Summary

An Airprox was reported when a CL350 and a Calidus flew into proximity in the vicinity of Dundee at 1234Z on Sunday 29th September 2024. The CL350 pilot was operating under IFR in IMC in receipt of a Procedural Service from Dundee and the Calidus pilot was operating under VFR in VMC not in receipt of an ATS.

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

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from both pilots, radar photographs/video recordings and GPS data, a report from the air traffic controller 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.

The Board first considered the actions of the Dundee controller. Without a radar, or any form of FID, the controller had not had way of knowing that the Calidus had been crossing the approach lane until they happened to see it whilst looking through binoculars for the CL350. Once they had seen the Calidus, they had passed Traffic Information to the CL350 pilot, although this had coincided with the CL350 pilot commencing their go-around. Noting that the Dundee controller had been operating without any form of surveillance equipment, and that normally, on a weekday, Leuchars ATC would have been able to have provided some Traffic Information using their radar, some Board members wondered whether the current equipment available to controllers at Dundee is sufficient to ensure the safest level of operation, given the level and nature of traffic operating to and from DundeeAirport.

When looking at the actions of the CL350 pilot, members noted that the pilot had been pre-warned by the Scottish controller that there had been a lot of traffic in the Dundee area. Primed with this, when IMC and they received information on their TCAS about traffic ahead, but without any height information, they had elected to go-around, thus increasing the separation between the two aircraft.

Turning to the actions of the Calidus pilot, they reported that they had changed their heading in order to avoid a skein of geese, but members thought that in doing so, the pilot had not sufficiently considered the consequence of their actions as this heading had taken them across the Dundee approach lane at a similar height to aircraft on the RNP approach. The feathers were clearly marked on VFR charts, and members thought that, at the very least, the Calidus pilot could have called Dundee to pass details about their intentions.

Concluding their discussion, members agreed that, whilst the sighting of a contact on the TCAS had caused the CL350 pilot concern, the avoiding action taken by the CL350 pilot, by initiating a go-around, meant that the separation between the aircraft had been sufficient that normal safety margins had pertained. Members were satisfied that there had not been a risk of collision and agreed on the following contributory factors and outcomes:

CF1: The Traffic Information provided to the CL350 pilot by the Dundee controller had been late, because the controller had not known about the Calidus crossing the approach path.

CF2. The Dundee controller had not received any prior situational awareness on the Calidus, until they became visual with it.

CF3. The Calidus pilot could have called Dundee to advise them of their intentions to cross the Approach lane.

CF4. The Calidus pilot had not sufficiently considered how their heading change would affect traffic approaching Dundee airport.

CF5. The Calidus pilot had not received any prior situational awareness about the presence of the CL350.

CF6. The CL350 pilot had been concerned by the situational awareness that they had received from their TCAS.

CF7. The CL350 pilot had received a TCAS TA.

CF8. It would be expected that the CWS on the Calidus would have alerted to the CL350, but no such alert had been reported.

CF9. The CL350 crew had not been visual with the Calidus.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2024248			
CF	**Factor**	**Description**	**ECCAIRS Amplification**	**UKAB Amplification**
	Ground Elements			
	• Situational Awareness and Action			
1	Human Factors	• ANS Traffic Information Provision	Provision of ANS traffic information	TI not provided, inaccurate, inadequate, or late
2	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			
3	Human Factors	• Accuracy of Communication	Events involving flight crew using inaccurate communication - wrong or incomplete information provided	Ineffective communication of intentions
4	Human Factors	• Insufficient Decision/Plan	Events involving flight crew not making a sufficiently detailed decision or plan to meet the needs of the situation	Inadequate plan adaption
	• 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
6	Human Factors	~~• Unnecessary Action~~	~~Events involving flight crew performing an action that was not required~~	Pilot was concerned by the proximity of the other aircraft
	• Electronic Warning System Operation and Compliance			
7	Contextual	• ACAS/TCAS TA	An event involving a genuine airborne collision avoidance system/traffic alert and collision avoidance system traffic advisory warning triggered	
8	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			
9	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: 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:

Ground Elements:

Situational Awareness of the Confliction and Action were assessed as **partially effective** because the Dundee controller had no way of knowing that the Calidus had been crossing the extended centreline until they had seen it through binoculars, consequently, the controller had only been able to pass late Traffic Information to the CL350.

Flight Elements:

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

Tactical Planning and Execution was assessed as **partially effective** because the Calidus pilot had not fully taken into consideration that they would be flying through the Dundee approach path when they adjusted their heading to avoid a skein of geese.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because the Calidus pilot had not received any situational awareness on the presence of the CL350.