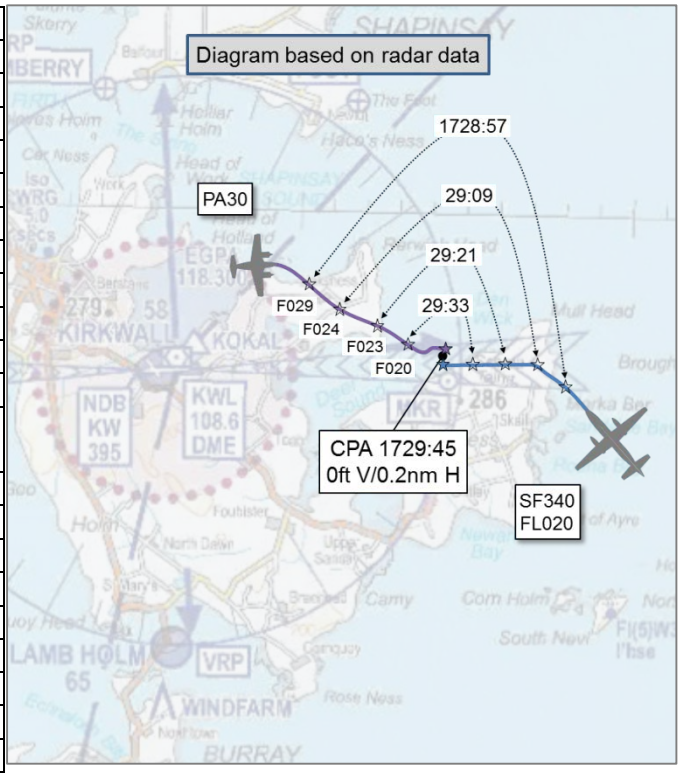
AIRPROX REPORT No 2015164

Date: 17 Sep 2015 Time: 1730Z Position: 5857N 00245W Location: 4.5nm east Kirkwall

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	SF340	PA30
Operator	CAT	Civ Pte
Airspace	Scottish FIR	Scottish FIR
Class	G	G
Rules	IFR	IFR
Service	Aerodrome	Aerodrome
Provider	Kirkwall	Kirkwall
Altitude/FL	FL020	FL020
Transponder	A, C, S	A, C, S
Reported		
Colours	White/blue	White/red/blue
Lighting	Beacon, strobes, landing	Strobe
Conditions	VMC	VMC
Visibility	NK	>10km
Altitude/FL	1500ft	2000ft
Altimeter	QNH (NK hPa)	NK (998hPa)
Heading	271°	090°
Speed	150kt	140kt
ACAS/TAS	Not Serviceable	Not fitted
Separation		
Reported	100ft V/1nm H	0ft V/0.5nm H
Recorded	0ft V/0.2nm H	



THE SF340 PILOT reports inbound to Kirkwall [from the south] on a scheduled CAT flight. Scottish requested that their flight descend to FL60 and maintain high speed to increase separation with a 'GA twin-engine aircraft' that was also heading to Kirkwall. The weather at destination required the SF340 flight to commence the [anti-clockwise] arc for RW27. After speaking with Kirkwall Air Traffic, and being established on the arc at approximately the 240° bearing from Kirkwall, the crew became visual with the airfield and requested a visual approach at approximately 8 miles. The twin-engine aircraft's pilot had checked in and advised Kirkwall Air Traffic that he was positioning to the north of the airfield via the overhead for a right-hand base turn to final. The SF340 pilot believed the other pilot advised he had their aircraft in sight. The SF340 pilot was visually scanning for the twin to the north of the field and, at 1500ft, identified the aircraft in the 11 o'clock position, he reported, on a closing course. The SF340 pilot banked to the left to maintain separation and it appeared the twin pilot was also avoiding to his left. The SF340 pilot stated that the twin pilot was in disagreement when speaking with Kirkwall Air Traffic that his flight was required to wait to land.

He perceived the severity of the incident as 'Medium'.

THE PA30 PILOT reports inbound to Kirkwall [from the south]. He was held at FL060 and thereafter at 4000ft, inbound to Kirkwall overhead. The inbound SF340 was on a Procedural Service with Scottish and Kirkwall, using the DME arc for RW27. Cloud was overcast at around 3500-4000ft south of Kirkwall but to the north and east the conditions were CAVOK. He requested to descend under VFR to the north of Kirkwall, intending to self-position for a right base for RW27. He was aware of the SF340 on a DME arc procedure for RW27. He thought that at some point the SF340 pilot asked to continue under VFR and cancel his procedural approach. Kirkwall requested the SF340 pilot report left base for RW27. The PA30 pilot believed the SF340 pilot must have reported left-base because thereafter Kirkwall cleared him to land. The PA30 pilot was then cleared to position number two to the SF340. He was northeast of the airfield in perfect VFR conditions. He started to turn right-base at

about 3 miles, thinking the SF340 must be on very short final. He was concentrating his lookout down the final approach path and the runway, expecting to see the SF340 about to land. Not seeing the aircraft, he became increasingly anxious and decided to turn away from the airfield and back outbound on an extended downwind leg. He had just started outbound again when he saw the SF340 at a similar level in his 1 o'clock position. He immediately initiated a left turn, and noticed the SF340 turning slightly left. He commented that the two aircraft were closer than would normally be acceptable, and it seemed as if neither of the pilots had a clear mental picture of each other's position. He was confused by the report of 'left base' and 'cleared to land' because he expected the SF340 to be at 4 miles or less at that point. He supposed the SF340 could have been closer to the far end of the arc, at 9 DME, when the pilot reported left-base.

He assessed the risk of collision as 'Low'.

THE MORAY CONTROLLER reports the PA30 and SF340 were transferred to Kirkwall Approach at approximately 1725. Both pilots were operating under IFR on transfer, and had been sequenced to assist Kirkwall so that the SF340 was underneath the PA30 and 'number one' to make an approach. Both crews were aware of each other and of the plan to make the SF340 'number one'. At 1730, he observed the SF340 on the approach for RW27 at approximately 2000ft and that the PA30 was heading straight at him and descending from 3000ft. He called Kirkwall to point out the radar picture and check that the crews were visual. The Kirkwall controller's impression was that the PA30 was to the north of the SF340. Before the controller had finished his reply the blips merged and then emerged clear of each other.

THE KIRKWALL CONTROLLER reports an SF340 was inbound to Kirkwall from the south on a Procedural Service. This aircraft was due to arrive just ahead of a PA30, also inbound to Kirkwall from the south. The SF340 pilot transferred to Kirkwall frequency first, at FL50, was given a Procedural Service, and was cleared for the direct arrival arc procedure to RW27. Very shortly after, the PA30 pilot transferred to Kirkwall frequency, higher than the SF340, at FL70. The PA30 pilot reported 'visual' and was offered a Basic Service. Both pilots' position reports put them at a similar range to one another, and Kirkwall ATC entered a local agreement with the PA30 pilot, told him he was number 2 to the SF340, and requested he maintain his level and continue towards the airfield to ensure he remained 'out of the way'. Further level checks were obtained from the SF340 pilot, and subsequently lower levels were offered to the PA30 pilot, still agreeing to keep 1000ft above the SF340. Whilst the SF340 was on the arc procedure, the PA30 pilot stated he would route overhead the airfield to the north, and await joining instructions. This was agreed with Kirkwall ATC, and he was asked to report passing overhead, which he did. The SF340 pilot requested a visual approach for RW27, which Kirkwall ATC cleared him for, and he was asked to join and report left base. Kirkwall ATC advised the PA30 pilot that the SF340 was now on a visual approach, joining left-base for RW27. He was told to join and report on a right-base for RW27, with no further descent restriction, and advised he was number 2 to the SF340, which he acknowledged. The SF340 pilot reported left base, and was cleared to land RW27. As the SF340 landed, Kirkwall ATC saw the PA30 to the northeast of the field. Once the runway was clear, the PA30 pilot was cleared to land also. After both aircraft had taxied in, the SF340 pilot called Kirkwall ATC via radio to report an Airprox with the PA30 at about 5 miles on final approach at 1500ft.

Factual Background

The weather at Kirkwall was recorded as follows:

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METAR EGPA 171720Z 33011KT 9999 -SHRA FEW008 SCT016 BKN030 13/12 Q0998=
METAR EGPA 171750Z 32006KT 9999 VCSH FEW009 SCT018 13/11 Q0999=
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A transcript of the Kirkwall frequency was provided, as follows:

From	To	Speech Transcription
SF340	TWR	Kirkwall air traffic [SF340 C/S] flight level six zero, we have twenty nine miles to run (1719:10) and er we're currently on the er two fifteen er radial off er Kilo Whiskey Lima
TWR	SF340	[SF340 C/S] Kirkwall (1719:20) good evening, India is current, it's a Procedural Service and say again your range please
SF340	TWR	We're currently twent- twenty eight miles to run, [SF340 C/S] (1719:30)
TWR	SF340	[SF340 C/S] roger, you can descend now flight level five zero
SF340	TWR	Descend flight level five zero [SF340 C/S]
TWR	SF340	(1719:40) [SF340 C/S] further descent on reaching the one five D M E and descend to altitude two thousand six hundred feet Q N H, nine nine eight (1719:50) hectopascals, you are cleared for the arc procedure to the I L S runway two seven, report turning right on the arc
SF340	TWR	Er say again [SF340 C/S] (1720:00)
TWR	SF340	[SF340 C/S] further descent on reaching one five D M E, descend to altitude two thousand six hundred feet Q N H nine nine eight hectopascals, you are cleared (1720:10) for the arc procedure to the I L S runway two seven, report turning right on the arc
SF340	TWR	Okay, at one five d- descend altitude two thousand six hundred feet Q N H of niner (1720:20) niner eight hectopascals and we are cleared for the arc procedure runway two seven [wilco (?)] [SF340 C/S]
PA30	TWR	Kirkwall good evening, [PA30 C/S] range one six at present, flight level seven zero, have India, nine (1721:00) er nine nine six hectopascals [PA30 C/S]
TWR	PA30	[PA30 C/S] Kirkwall good evening, India is current, Q N H is nine (1721:10) nine eight hectopascals
PA30	TWR	Yeah apologies, nine nine eight hectopascals, er I'm just routeing to the overhead, I'm actually V F R (1721:20) with the ground at present but er we're????? ????? maintain separation [PA30 C/S]
TWR	PA30	[PA30 C/S] roger, there's a Saab three forty inbound the field not far behind you, just below you, (1721:30) so maintain f- flight level seven zero
PA30	TWR	Maintain seven zero, yeah????? below us and if I can descend soon as possible [PA30 C/S] (1721:40)
TWR	PA30	[PA30 C/S] of course, I'll er get updates for you and get you down as quick as I can
PA30	TWR	yeah I should have expedited my descent earlier cause I could have been the ground four to five minutes before but never mind (1721:50) [PA30 C/S]
TWR	SF340	[SF340 C/S] Kirkwall new Q N H nine nine nine (1722:30) hectopascals
SF340	TWR	New Q N H nine nine nine hectopascals [SF340 C/S] and that's us at one five D M E
TWR	SF340	[SF340 C/S] roger, is that you leaving flight level five zero (1722:40)
SF340	TWR	Will be yep and????? ????? descending altitude two thousand six hundred feet on the Q N H nine nine nine hectopascals [SF340 C/S]
TWR	SF340	Roger tha- thanks confirm your level now
SF340	TWR	Say again [SF340 C/S]
TWR	SF340	Just confirm your level now please
SF340	TWR	Er currently four thousand four hundred feet [SF340 C/S]
TWR	SF340	Roger thanks
TWR	PA30	(1723:00) [PA30 C/S] descend flight level five zero and er new Q N H nine nine nine hectopascals
PA30	TWR	(1723:10) nine nine nine hectopascals, say again cleared level
TWR	PA30	[PA30 C/S] descend flight level five zero
PA30	TWR	(1723:20) descend flight level five zero [PA30 C/S]
TWR	PA30	[PA30 C/S] confirm Basic Service
PA30	TWR	Confirm Basic Service [PA30 C/S]

From	To	Speech Transcription
PA30	TWR	If you've got a radial position for him o- on, from the arc, can I descend V F R towards Lamb Holm (1723:40)
TWR	PA30	[PA30 C/S] you're pretty much neck and neck at the moment, just maintain separation, I appreciate if you could k- keep (1723:50) below five zero
PA30	TWR	Affirm maintaining five zero
SF340	TWR	[SF340 C/S] turning right on the arc
TWR	SF340	[SF340 C/S] roger, report passing altitude (1724:00) three thousand feet and localiser established
SF340	TWR	Wilco [SF340 C/S]
SF340	TWR	[SF340 C/S] passing through three thousand feet
TWR	SF340	[SF340 C/S] roger, thank you
Other ac	TWR	[Non-relevant RT]
TWR	PA30	[PA30 C/S] you can descend altitude four (1724:40) thousand feet, Q N H nine nine nine
PA30	TWR	Descend four thousand feet, nine nine nine, [PA30 C/S]
TWR	SF340	(1725:40) [SF340 C/S] your passing radial please
SF340	TWR	Currently passing a bearing of one six zero for the field [SF340 C/S]
TWR	SF340	Roger thanks (1725:50)
TWR	PA30	[PA30 C/S] Kirkwall, that Saab's on the arc, just passing the one six zero radial if you want to descend V F R towards Lamb Holm and next report at Lamb Holm (1726:00)
PA30	TWR	Yeah I'm actually inbound to Kirkwall, sorry, I'd just thought I could, I could make a V F R approach, well I am inbound to Kirkwall er level four thousand feet now
TWR	PA30	(1726:10) [PA30 C/S] roger, are you wanting to do a visual approach or are you wanting to use the I L S
PA30	TWR	No I'll do a visual approach [I think its (?)] V F R underneath, is it
TWR	PA30	No it's not too bad?????
PA30	TWR	(1726:30) maybe just er route through the overhead towards the north and then after the Saab's landed I'll, I'll position for right base
TWR	PA30	[PA30 C/S] roger appreciate that, report passing overhead (1726:40)
PA30	TWR	Report overhead [PA30 C/S]
SF340	TWR	(1727:20) and [SF340 C/S] visual with the field so we're happy to take a visual approach
TWR	SF340	[SF340 C/S] roger, you are cleared for visual approach runway two seven, report on left base (1727:30)
SF340	TWR	Cleared visual approach runway two seven wilco [SF340 C/S]
PA30	TWR	[PA30 C/S] through the overhead now, four thousand feet
TWR	PA30	[PA30 C/S] (1727:40) roger thanks
SF340	TWR	(1727:50) [SF340 C/S] left base runway two seven
TWR	SF340	[SF340 C/S] continue approach
SF340	TWR	Continue approach [SF340 C/S] (1728:00)
TWR	PA30	[PA30 C/S] there's no further descent restrictions if you want to report right base runway two seven number two to the Saab
PA30	TWR	(1728:10) report right base two seven, number two to the Saab [PA30 C/S]
TWR	SF340	[SF340 C/S] runway two seven, clear to land, wind is three two zero eight
SF340	TWR	(1728:30) clear to land [SF340 C/S]
TWR	SF340	(1732:00) [SF340 C/S] taxi apron via runway one four
SF340	TWR	Apron via runway one four [SF340 C/S]
TWR	PA30	[PA30 C/S] for runway two seven, clear (1732:30) to land, wind is three two zero six
PA30	TWR	Clear to land [PA30 C/S]

From	To	Speech Transcription
TWR	PA30	[PA30 C/S] vacate right and taxi to the hangar (1734:40)
PA30	TWR	Right to the hangar er [PA30 C/S]
SF340	TWR	Kirkwall air traffic [SF340 C/S]
TWR	SF340	(1734:50) [SF340 C/S] pass your message
SF340	TWR	Yeah clear on that visual approach that our friend there came down our left side no more than a quarter of a mile and I- I (1735:00) had to deviate to left because he'd been in a hurry up to get back to Kirkwall, which totally threatened this aircraft so it's going to require another Airprox
TWR	SF340	(1735+10-) [SF340 C/S] that's copied, thanks for that
PA30	TWR	Er just a bit of feedback on that (1735:30) so I'll phone you when I get er get parked [PA30 C/S]
TWR	PA30	????? ?????

Analysis and Investigation

CAA ATSI

The SF340 pilot was operating under IFR on a commercial passenger service and was [initially] making a Direct Arrival (Instrument) to RW27 at Kirkwall. The SF340 pilot was in receipt of a Procedural Service from Kirkwall Tower. The PA30 pilot was operating under IFR and was in receipt of a Basic Service from Kirkwall Tower.

ATSI had access to reports from the Tower Controller at Kirkwall, the Moray Area Sector Controller at the ATC centre in Prestwick and the Unit Investigation from the Parent ATC Centre. ATSI also had the SF340 pilot report together with the area radar recordings, RT and transcript of the unit position frequency. Screenshots produced in the report are provided using the area radar recordings. Levels indicated are flight levels. All times UTC.

At 1712:04, the Moray Area Controller telephoned Kirkwall and passed an ETA of 1726 for the SF340 inbound to Kirkwall. The PA30 ETA had already been passed and was similar but, following a discussion between Kirkwall and Moray it was agreed that the SF340 would likely overtake the PA30 as they approached Kirkwall. Accordingly, coordination was effected whereby the SF340 pilot would be released at FL60 and the PA30 pilot at FL70. Both pilots were flying under IFR but the type of approach each aircraft was likely to make at Kirkwall was not discussed.

At 1716:12, the PA30 pilot requested the position of the SF340 from Moray and was advised that it was likely to get to Kirkwall a couple of minutes before him. The PA30 pilot advised Moray that he would reduce speed to increase the separation between aircraft.

The SF340 pilot reported on the Kirkwall frequency at 1719:05 and a Procedural Service was agreed. The SF340 pilot was cleared for the Procedural ILS approach, joining the Kirkwall 9DME arc (the arc) for RW27, together with a descent to FL50 at 1719:53. Figure 1 depicts the approach the SF340 pilot was intending to make, from the south.

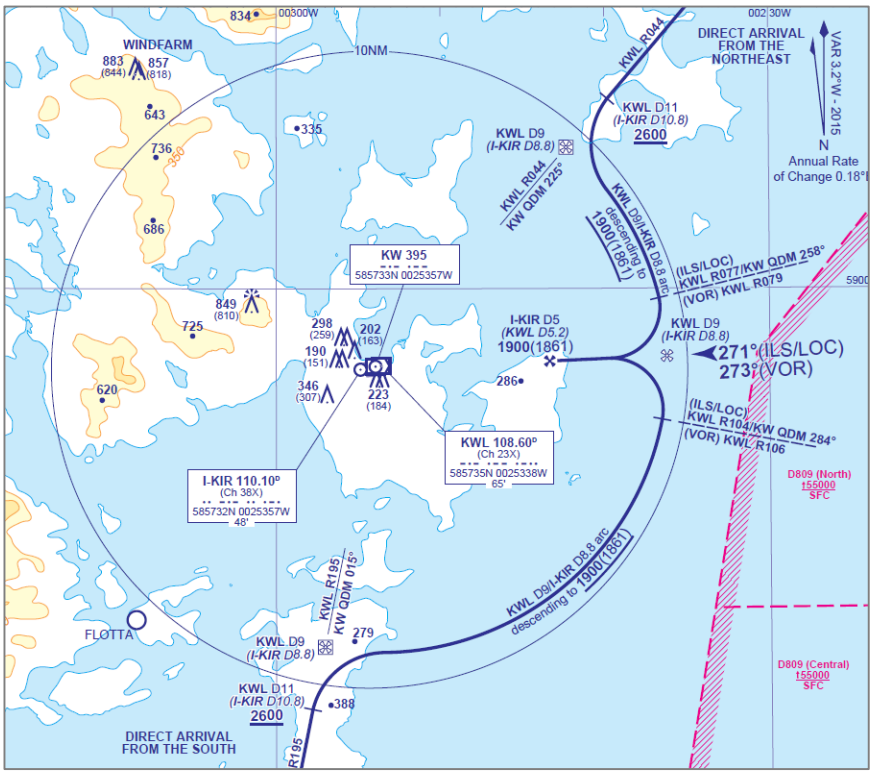

Figure 1: Direct ILS approach via 'the arc'.

The PA30 pilot reported on frequency at 1720:57 at FL70 and, during the conversation, the pilot commented that if he had commenced descent earlier he would have landed 4-5 minutes before the SF340. The PA30 pilot agreed to track towards the overhead, maintain FL70, and asked that a descent be issued as soon as practicable in relation to the SF340. Figure 2 depicts the traffic situation at that time.

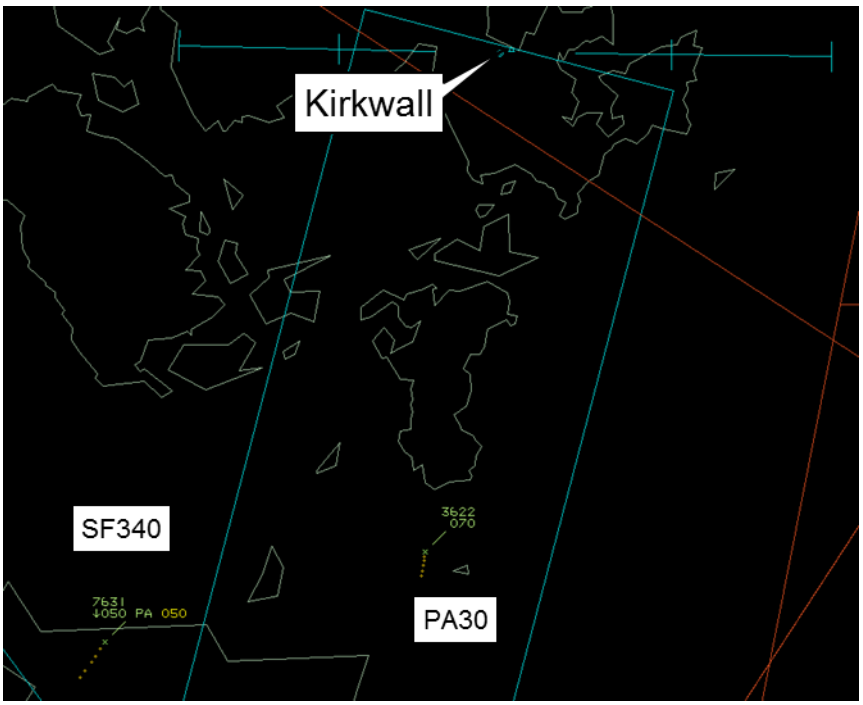

Figure 2: Prestwick radar 1720:57.

At 1722:40, the SF340 pilot reported passing 15nm from Kirkwall as had been requested. The SF340 pilot also reported passing 4400ft at this stage. At 1723:00 the Kirkwall controller descended the PA30 pilot to FL50 and a Basic Service was agreed. At 1723:54, the SF340 pilot reported turning right onto the arc (Figure 3) and was asked to report passing 3000ft.

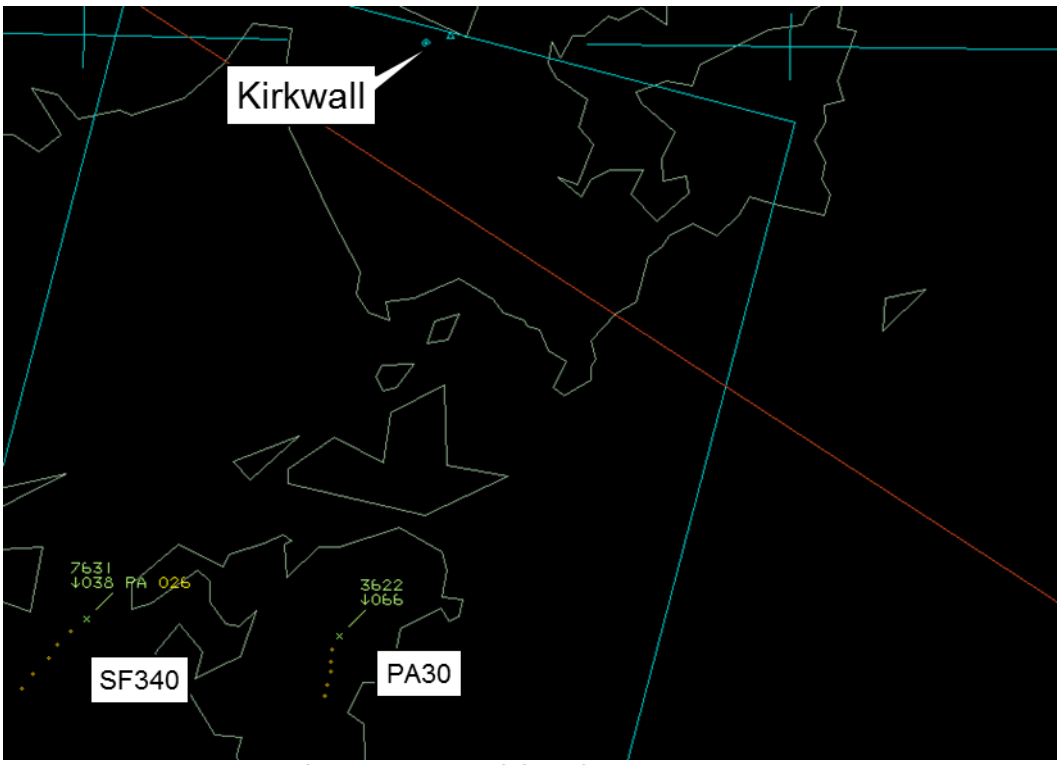

Figure 3: Prestwick radar at 1723:54.

At 1724:40, the PA30 pilot was cleared to descend to 4000ft following a report from the SF340 pilot passing 3000ft. At 1725:55 an exchange of RT commenced between the PA30 pilot and the controller, during which a discussion took place on what type of approach the PA30 pilot would like to make. After some confusion the PA30 pilot suggested that he wished to route through the overhead and position for a visual approach to right base after the SF340 had landed. The controller asked the pilot to report overhead.

At 1727:22, the SF340 pilot reported visual with the field and requested a visual approach. The controller cleared the SF340 pilot for the visual approach and told him to report left-base, to which the SF340 pilot agreed. Immediately afterwards the PA30 pilot reported in the overhead at 4000ft (Figure 4).

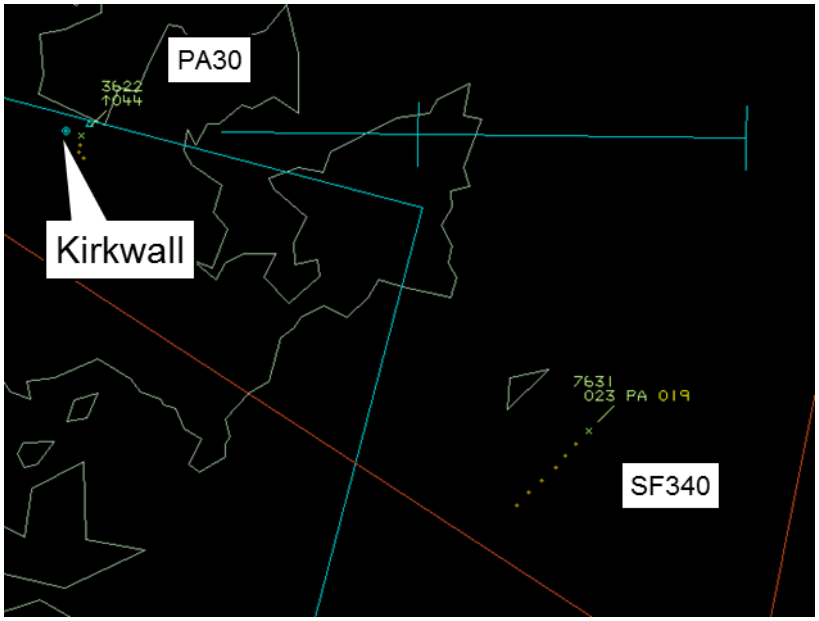

Figure 4: Prestwick radar as the SF340 pilot commenced the visual approach.

At 1727:50, the SF340 pilot reported that he was left-base and was told by the controller to continue his approach. At 1728:06, with the PA30 having earlier reported through the overhead [and therefore assumed to be north of the airfield with the SF340 to the south of the airfield and visually approaching from left-base], the controller gave the PA30 pilot "No further descent restrictions" and instructed the pilot to report right base for RW27, number two to the SF340. Radar showed that the PA30 pilot descended and, following a right turn overhead, routed initially downwind before then turning right inbound and then left just north of the final approach in the opposite direction to the SF340 until CPA occurred at 1729:45 (Figure 5).

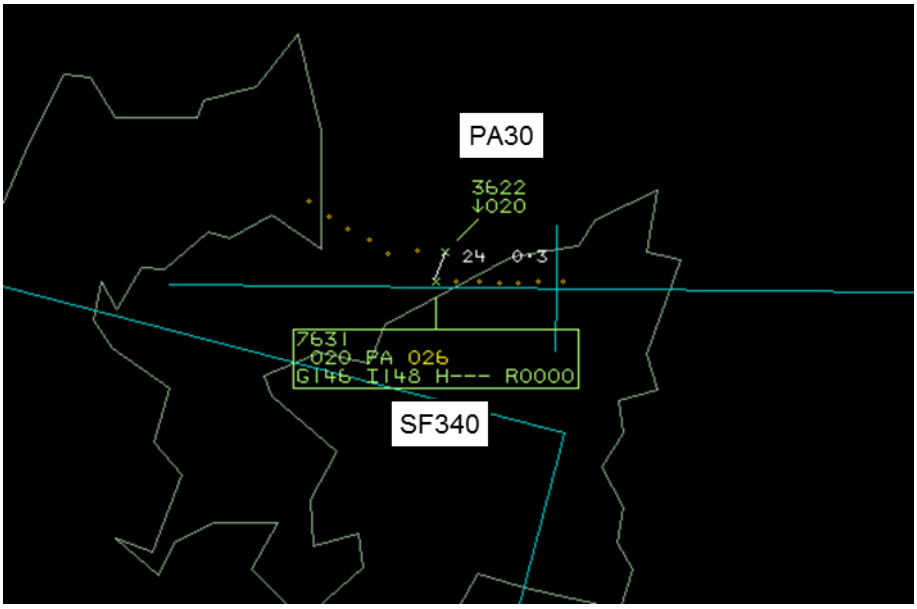

Figure 5: Prestwick radar 1729:45.

The Kirkwall controller accepted a release from the Moray sector controller where the SF340 was accepted below the PA30. The Kirkwall controller did not have the use of surveillance equipment and could only provide a Procedural Service or a Basic Service as Kirkwall is situated in Class G Airspace.

The SF340 pilot was initially cleared for an Instrument approach that involved tracking via a DME arc to the southeast of Kirkwall. This would have added more track miles to the inbound SF340 and does not appear to have been factored in to the release from Moray while assessing the potential landing order at Kirkwall.

The PA30 pilot had indicated that a visual approach was desirable and the Kirkwall controller was aware that the relative tracks of the two aircraft would initially cross. Although the PA30 pilot was being provided with a Basic Service the controller continued to provide at least 1000ft vertical separation until the PA30 pilot reported passing overhead. Once the PA30 pilot reported overhead, and the relative track confliction had been resolved, the controller issued instructions to enable the PA30 pilot to position as number two in the traffic sequence, and removed any vertical separation restriction. As the PA30 pilot was on a Basic service and not a Procedural service there was no requirement to separate the aircraft and the pilots remained responsible for their own collision avoidance. Although the controller did not pass specific Traffic Information on the PA30 to the SF340 pilot, the SF340 pilot indicated in his written report that he was aware of the progress of the PA30 and was continuing to look out for it.

The adoption of a Basic Service by one aircraft in this occurrence removed the requirement for ATC to separate these two IFR aircraft, although ATC did provide procedurally separated levels until the PA30 had passed through the airfield overhead.

NATS Ltd

In light of the fact that both pilots were in receipt of a service from Moray sector at Prestwick, prior to being handed over to Kirkwall Approach, NATS Ltd undertook a unit investigation. This made the following conclusion:

'When the Moray sector controller arranged with Kirkwall that [the SF340] would be given priority to [the PA30] due to assessing that [the SF340] would arrive in the overhead marginally before [the PA30], it was not discussed that [the SF340] would be flying the Arc procedure whilst [the PA30] would continue flying towards the overhead. Despite the two aircraft no longer being their direct concern, the Moray controller continued to monitor the two aircraft and phoned Kirkwall as they were concerned that the aircraft were converging laterally and vertically.'

It was noted that '… both aircraft had been handed over to Kirkwall separated and were no longer under the jurisdiction of Moray sector.'

UKAB Secretariat

The SF340 and PA30 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 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[2]. The UKAB assessment of CPA range is derived from interpolation between radar returns. CAP774 (UK Flight Information Services) states:

> 'The controller shall provide traffic information, if it is considered that a confliction may exist, on aircraft being provided with a Basic Service and those where traffic information has been passed by another ATS unit; however, there is no requirement for deconfliction advice to be passed, and the pilot is wholly responsible for collision avoidance. …'[3]
>
> 'Pilots must remain alert to the fact that whilst in receipt of a Procedural Service, they may encounter conflicting aircraft for which neither traffic information nor deconfliction advice has been provided. Pilots must still comply with Rules of the Air with regard to the avoidance of aerial collisions and advise ATC of any deviation from their clearance in order to do so. …'[4]
>
> 'Controllers may, subject to workload, initiate agreements (as defined in ATS Principles) with pilots of aircraft under a Basic Service to restrict their flight profile in order to co-ordinate them with aircraft in receipt of a Procedural Service. …'[5]

Summary

An Airprox was reported when an SF340 and a PA30 flew into proximity at 1730 on Thursday 17th September 2015. Both pilots were operating under IFR in VMC, the SF340 pilot in receipt of a Procedural Service and the PA30 pilot in receipt of a Basic Service, both from the Kirkwall Tower controller.

[1] SERA.3205 Proximity.
[2] The Rules of the Air Regulations 2015, Section 3, paragraph 9(1) – Order of Landing.
[3] Chapter 5 (Procedural Service), paragraph 5.5 (Traffic Information), page 39, dated July 2014.
[4] Chapter 5 (Procedural Service), paragraph 5.11 (Deconfliction), page 40, dated July 2014.
[5] Chapter 5 (Procedural Service), paragraph 5.12 (Deconfliction), page 40, dated July 2014.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from the pilots of both aircraft, a transcript of the relevant RT frequency, radar photographs/video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC authorities.

In what was a protracted discussion of the incident, the Board first addressed the initial chronology of events. During the handover, the Moray and Kirkwall controllers had discussed the order of arrival of the two aircraft and had agreed that the SF340 would be handed over at a lower level than the PA30, in order to make its approach to land first. The Moray controller had informed each pilot of the planned order of arrival. Both pilots were operating under IFR with weather in the vicinity of Kirkwall recorded as FEW at 8-900ft, SCT at 16-1800ft and BKN at 3000ft with light rain-showers in the vicinity. Members agreed that, although the controllers did not discuss the type of approach each pilot would make (and the Moray controller would not necessarily have been aware of the approaches available at Kirkwall), it was not unreasonable to assume, given the reported weather conditions and that they were both operating under IFR, that they would each make an instrument approach, at least initially. The SF340 pilot was handed over first, at FL60, was given a Procedural Service, reported his range as 28nm and was cleared for 'the arc procedure to the ILS RW27'. The PA30 pilot was handed over about 2min later, at FL70, reported his range as 16nm and reported that he was 'VFR with the ground'. This transmission was considered ambiguous by the Board in that members wondered whether the PA30 pilot, or the Kirkwall controller, or both, might have thought that the PA30 pilot was cancelling IFR at that point [UKAB Post-Board Note: the Kirkwall controller subsequently stated that he believed the PA30 pilot was operating under VFR from that point]. If the PA30 pilot meant 'visual with the ground (but maintaining IFR)' then that was one thing; if he meant 'VFR, with the ground in sight' then that was another. Members agreed that this exchange was amongst a number which could be characterised as ambiguous and/or using non-standard RT phraseology, which in sum had been contributory to the Airprox. Whatever the perception, no FIS was agreed initially, and the pilot did not state, nor did the controller request, either his approach intentions or whether he was remaining IFR or cancelling IFR to continue under VFR. The Board felt that this was the first lost opportunity to clarify properly who was doing what. The PA30 pilot was then informed of the inbound SF340 'not far behind' and below him, and was requested to maintain FL70, which he agreed to do, commenting that he could have been on the ground '4 or 5 minutes earlier' than the SF340 if he'd descended earlier.

With pilots both still at least formally under IFR (IFR was never cancelled by either pilot or the controller), the Kirkwall controller issued stepped descent instructions to the PA30 pilot in order to maintain 1000ft separation between the aircraft. At about 2½min after initial contact, the Kirkwall controller rhetorically confirmed that the PA30 pilot wished to receive a Basic Service, which the PA30 pilot confirmed. Members felt that this was the second lost opportunity for the Kirkwall controller to have ascertained the PA30 pilot's intentions either to proceed visually (possibly cancelling IFR), or to continue on the arc procedure, (preferably also under a Procedural Service). In the event, the PA30 pilot did not state, nor did the Kirkwall controller obtain, an explicit plan for the PA30 pilot's approach to Kirkwall.

The Kirkwall controller then applied a degree of control to the PA30 pilot which the Board thought was probably indicative of his unease at the degree of separation afforded by the services applied. The PA30 pilot continued directly towards Kirkwall whilst the SF340 pilot flew the arc procedure, with the PA30 pilot stating that he could 'descend VFR towards Lamb Holm [VRP]'. Members thought that this, again, was an ambiguous call in that it implied that the PA30 pilot now wished to continue under VFR rather than IFR. However, the PA30 pilot did not formally cancel IFR, nor did the Kirkwall controller ask if he wished to do so. This was the third lost opportunity for clarification of the PA30 pilot's intentions. At this point, members thought that the PA30 pilot and Kirkwall controller probably thought the PA30 pilot was operating under VFR. The Kirkwall controller then stated that the two aircraft were 'pretty much neck and neck at the moment', and that the PA30 pilot should 'just maintain separation'. Members agreed that this was probably said in the heat of the moment but that it was not a satisfactory solution to what was becoming a growing problem. Members discussed who was responsible for providing a solution for maintaining separation and agreed that, although ultimately

the pilots were responsible for collision avoidance, they could best fulfil this responsibility with the assistance of ATC. In this case, the PA30 pilot, (who was aware of the sequencing plan for him to land after the SF340), could reasonably have taken action. He could, for example, have requested a Procedural Service and flown the arc behind the SF340. Alternatively, he could have cancelled IFR and proceeded visually, but remained clear of the IFR approach path until he was visual with the SF340, with the assistance of ATC. In either case, it was the Kirkwall controller's responsibility to sequence the aircraft and therefore to agree a definitive plan with the PA30 pilot. [UKAB Post-Board Note: The Kirkwall controller subsequently contended that, in his opinion, he had made a robust plan for the PA30 pilot to continue to the overhead under VFR, maintaining vertical separation by agreement until north of the airfield, and then to sequence himself behind the SF340]. Notwithstanding, Board members decided that the lack of a plan sufficiently robust to allow for effective aircraft sequencing had been contributory to the Airprox.

The PA30 pilot's intention to make a visual approach was ascertained shortly after 1726, about 5min after initial contact. He agreed that he would position for right base after the SF340 had landed, although he was still unsure as to the state of the weather at Kirkwall. This was the first time that a clear plan was articulated for the PA30 and, accordingly, he was cleared through the airfield overhead. He reported 'through the overhead' (just after the SF340 pilot reported visual with the airfield) and was cleared for a visual approach, to report right-base. Members again questioned whether the Kirkwall controller could have taken action at this point to clarify things because the PA30 pilot was much closer to the airfield than the SF340 pilot who had just left the 9DME arc. In the event, the PA30 pilot was cleared to report right base No2 to the SF340 as he passed through the airfield overhead and his descent restriction was cancelled. ATC members agreed that the controller would have been better served by either only clearing the PA30 pilot to downwind until he reported visual with the SF340, or asking the SF340 for his range to go in order to determine whether the PA30 could be sequenced first. In either case, once the altitude restriction had been cancelled, the PA30 was not well out of the way of the SF340 approach or missed approach paths.

At this point in the discussion, members also commented on the use of RT terminology, and specifically the reference to 'base'. They noted that, although this term is defined, it is done so in 2 different contexts with differing meanings; this was a further source of uncertainty for the PA30 pilot and the Kirkwall controller.

The ICAO definition of 'Base Turn' was:

> **'Base Turn** A turn executed by the aircraft during the initial approach between the end of the outbound track and the beginning of the intermediate or final approach track. These tracks are not reciprocal. (ICAO)'[6]

Whereas the position of 'Base Leg' was defined in MATS Part 1 as:

> '…being within 4 miles of the threshold.'[7]

The SF340 pilot, operating in the context of the instrument approach pattern, reasonably referred to his position as left base (ICAO), and was asked to do so by the Kirkwall controller; the PA30 pilot, operating in the context of the visual circuit pattern, expected traffic reporting left base to be within 4 miles of the airfield (MATS Part 1), although some pilot members commented that this was a somewhat naïve assumption given his knowledge of the SF340 pilot's 'arc' approach and elapsed time since calling visual with the airfield. Nonetheless, this disparity was critical to the subsequent turn of events in that the PA30 pilot was looking towards the airfield for the SF340 when, in fact, the SF340 was still at range to the airfield. Members agreed that the contextual use of the term 'left base' had been contributory to the Airprox. For his part, the SF340 pilot had almost reached the end of the 9DME arc when he had requested a visual approach and turned towards the airfield. Some members felt that, in being 'cleared for visual approach runway two seven, report on left base', this

[6] CAP493, Definitions, page 5.
[7] CAP493 Section 2, Chapter 1 (Aerodrome Control), page 15, paragraph 17 (Designated Positions in the Traffic Circuit)

put the SF340 pilot more in the MATS Part 1 meaning of 'base leg' rather than the ICAO 'base turn', as was evident in the PA30 pilot's mind-set. All-in-all, members agreed that the SF340 pilot could have better described, or been requested to describe, his position as a range to the airfield or as 'long final' to avoid confusion and thereby enable the PA30 pilot sufficient SA to gain timely visual contact. Members further agreed that any of the three Airprox participants could also have requested the position of each aircraft if they were uncertain; the Kirkwall controller, the SF340 pilot and the PA30 pilot all had sufficient opportunity to establish that the SF340 was still at range from the airfield, but no one acted to clarify the situation.

Having been cleared to report right-base, the PA30 pilot took up a closing track towards the final approach path. Members surmised this was due to his being seated in the left seat and looking towards the airfield to the right and across the aircraft cabin and that there was little prospect of the PA30 pilot gaining visual contact with the SF340 that was still on final approach to his left. Becoming increasingly concerned that he could not see the SF340, the PA30 pilot eventually turned left, away from the final approach path. It was during this turn that he saw the SF340 and commented that its pilot too appeared to make a left turn to avoid. The Board noted that the SF340 pilot had been cleared for a visual approach as No1 and had reported left base. He was no doubt aware of the PA30 in the vicinity of the airfield overhead from previous RT transmissions, saw it on a 'closing course', and took avoiding action by turning left. Notwithstanding the SA that he had built up during his approach, ATC members noted that the Kirkwall controller had not provided the SF340 pilot with any Traffic Information regarding the PA30 and they felt that this could have broken the chain of events by highlighting to the SF340 pilot that the PA30 was downwind, and to the PA30 pilot that the SF340 was to his left.

At this point in the debate, members noted that the SF340 TCAS was unserviceable and that, although it was not a requirement for that flight, its serviceability would have afforded the SF340 pilot significantly increased situational awareness in the Class G airspace around Kirkwall. The results of a TCAS simulation suggested that the SF340 pilot would have received a TCAS proximate traffic indication at about 1728:57, as the PA30 descended towards it at a range of about 4.1nm, a TCAS TA at 1729:13, at a range of 2.5nm, a TCAS RA 'Monitor Vertical Speed' (do not descend) at 1729:30 at a range of 1.1nm and a TCAS RA 'Climb' (>1500fpm) at 1729:33, at a range of 0.8nm from the PA30. Nevertheless, the Board noted that the SF340 pilot was aware of the PA30 pilot's routing and had the PA30 in sight during the latter stages of his approach. It was noted that the SF340 pilot had reported seeing the PA30 in the left 11 o'clock position, which occurred at a range of 3.5nm, with the PA30 500ft above and descending towards the SF340 in its left turn.

Members also commented on the UK FIS regulations which seemed to allow 2 pilots operating under IFR and recovering to the same airfield at the same time, to be in communication with a controller who was not explicitly obliged to coordinate or separate them due to the type of FIS each was under. Some members wondered how this could efficiently allow the controller to discharge his duty to ensure the safe and expeditious flow of traffic. It was acknowledged that the controller's duty of care was such that he would not allow a perceived confliction to develop into a risk of collision, or worse, but it was also noted that duty of care could best be applied in a proactive sense rather than simply reacting to a perception of conflict; for example, pro-active coordination between traffic on a Procedural Service and a Basic Service until one or both pilots were visual with the other aircraft. Members also noted that the word 'coordination' had a specific technical sense in ATM and that, in this case, it was meant in the sense of information flow between participants such that proactive steps could be taken, for example, to sequence traffic onto final approach. An ATC member also pointed out that the PA30 pilot had been cleared by the Kirkwall controller to fly through the airfield overhead, where the altitude restriction was cancelled, but that the SF340 pilot may have had to go-around at any time. Members agreed this clearance was reasonable if the assumption was made that the SF340 would be on the centreline and would fly the missed approach precisely. It was acknowledged that the Kirkwall controller could not anticipate every possible contingency but members agreed that such an assumption left no room for error and therefore that some degree of continued coordination, or at least understanding of each aircraft's position, was appropriate before granting such a clearance. Members noted that the PA30 pilot had suggested that he "*maybe just er route through the overhead towards the north and then after the Saab's landed I'll, I'll position for right*

base", which, with the later cancellation of altitude restriction, gave no assurance as to degree of separation from the final approach track. In such circumstances it was felt that provision of Traffic Information was essential and that it not being provided was contributory to the Airprox.

The Board then discussed the cause and risk at length. Some members felt that the PA30 pilot could have assisted the controller achieve the planned arrival sequence but that he had not done so. Others thought that the Kirkwall controller could have done more to clarify who was doing what and produce a more positive plan for sequencing the aircraft, or at least for them to report their positions more effectively. Other opinions were aired over the ambiguity of some of the radio calls, and the apparently misleading definitions and call of 'left base' from the SF340 pilot which had different interpretations depending on ICAO or MATS Part 1 definitions. After a much protracted debate, the Board agreed that, ultimately, it was for the pilots not to collide with each other and, more specifically, for the PA30 pilot, who had been sequenced as No2 to the SF340, to integrate with it. Consequently, the Board agreed that the cause of the Airprox was that the PA30 pilot had flown into conflict with the SF340. Notwithstanding, it was also strongly asserted by some members that the PA30 pilot would not have turned in front of the SF340 if he had known it was there, that it was for Air Traffic Control to provide positive control where needed and elicit the required reporting information from pilots to ensure a safe and orderly flow of traffic, and that it behoved all to be clear with their transmissions to avoid misinterpretation of intentions. With regard to risk, members considered that the providential left turn by the PA30 pilot, allied to the SF340 pilot's manoeuvre left, had both served to increase separation; notwithstanding, the Board unanimously agreed that safety margins had been much reduced below normal.

PART C: ASSESSMENT OF CAUSE AND RISK

Cause: The PA30 pilot flew into conflict with the SF340.

Degree of Risk: B.

Contributory Factors:
1. Contextual use of the term 'left base'.
2. Lack of a plan sufficiently robust to allow for effective aircraft sequencing.
3. Ambiguous and/or non-standard RT phraseology.
4. Lack of Traffic Information.