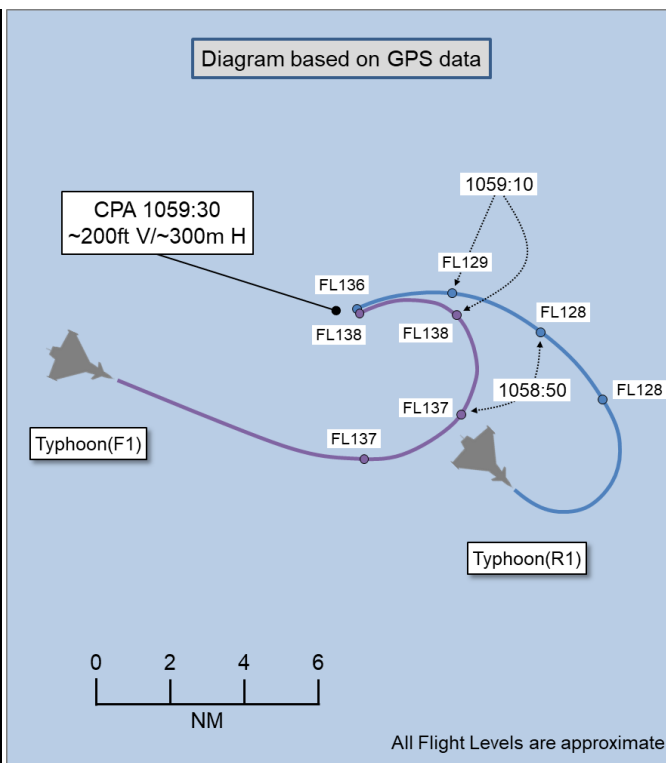


AIRPROX REPORT No 2025246

Date: 04 Dec 2025 Time: 1100Z Position: 5333N 00049E Location: 32NM E Grimsby

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	Typhoon(R1)	Typhoon(F1)
Operator	HQ Air (Ops)	HQ Air (Ops)
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	VFR
Service	Listening Out	Listening Out
Provider	Voyager Boom	Voyager Boom
Altitude/FL	~FL136	~FL138
Transponder	None ¹	None ¹
Reported		
Colours		
Lighting		
Conditions		
Visibility		
Altitude/FL	NR	NR
Altimeter		
Heading		
Speed		
ACAS/TAS		
Alert		
	Separation at CPA	
Reported	300ft	NR
Recorded	~200ft V/~300m H	



THE TYPHOON(R1) PILOT reports that, at 1059:30, [Typhoon(F1)] passed [Typhoon(R1)] and [Typhoon(R4)] at a perceived distance of 300ft whilst joining [the Voyager] in Air-to-Air Refuelling Area 8 (AARA8).

[UKAB Secretariat note: Throughout this report, reference has been made to callsigns, such as Typhoon(R1). These callsigns refer to the pilots involved and are not the actual callsigns].

The Voyager was established on the towline at FL160, in the block FL140-170 with multiple aircraft arriving and departing on what was a very busy Swanwick Military frequency. [Typhoon(R1)] and [Typhoon(R4)] were [not receiving data-link information due to equipment malfunction] and left the D323 complex at 1055:26 at FL130. Swanwick Military passed Traffic Information on [Typhoon(F1)] at 1055:46 and informed [Typhoon(R1)] that [Typhoon(F1)] would be refuelling ahead of [Typhoons (R1) and (R4)].

At 1056:52, having called visual with the tanker, [Typhoons (R1) and (R4)] were pushed to the Boom frequency, set their squawks to standby and were still aware that [Typhoon(F1)] would be joining ahead, so they maintained FL130. After calling visual on the Boom frequency, [Typhoons (R1) and (R4)] were cleared to join by [the crew of the Voyager]. [Typhoon(R1)] questioned if [Typhoon(F1)] was joining ahead of [Typhoons (R1) and (R4)] and the reply was “at some point, yes, but not at the moment”.

[Typhoon(R1)] called that they were “elevating for join” recognising that the join had been non-standard. Five seconds later, [the pilot of the Voyager] cancelled the join clearance and instructed [Typhoon(R1)] to “maintain FL150”. Having been at FL130 previously, [Typhoon(R1)] descended back to their

¹ The transponders fitted to Typhoons (R1) and (F1) had been switched to ‘Standby’ in accordance with air-to-air refuelling procedures.

previously assigned level, maintained 1NM trail and informed [the crew of the Voyager] of the level assigned by Swanwick Military.

At 1057:55, [Typhoon(F1)] called visual with [the Voyager] and [Typhoons (R1) and (R4)] but got no acknowledgement from [the crew of the Voyager] or clearance to join.

At 1058:44, [Typhoon(F1)] called to [Typhoons (R1) and (R4)] "*in your 6, visual FL140*".

At 1058:54, [the crew of the Voyager] called on the radio "*We've got [Typhoon(F1)] joining at FL150, so when cleared your level FL140, [Typhoon(F1)] has not called visual yet*". [Typhoon(R1)]'s situational awareness was that [Typhoon(F1)] had been elevated on the Swanwick Military frequency which [the Typhoon(R formation)] was no longer listening to and called on the radio "[Typhoon(R1)] *climbing FL140*". [Typhoon(F1)] called "*visual request join*" and was cleared to join by the [crew of the Voyager]. [Typhoon(R1)] asked if [Typhoon(F1)] was visual with them and [Typhoon(F1)] confirmed that they were.

At 1059:30, [Typhoon(R1)] was at 13,750ft on 1013hPa and became visual with [Typhoon(F1)] passing on the left at a perceived distance of 300ft, belly-up to [, and above, Typhoons (R1) and (R4)]. [Typhoon(R1)] arrested the climb and rolled-off to increase separation from [Typhoon(F1)]. Once passed, [Typhoons (R1) and (R4)] waited for [Typhoon(F1)] to call echelon on [the Voyager] prior to requesting join.

There appeared to be a few non-standard occurrences that led to a breakdown in situational awareness between the pilots of [Typhoon(R1), Typhoon(F1)] and [the Voyager]. [Typhoon(R1)] did not receive any joining instructions from the crew of [the Voyager] on the Swanwick frequency, nor did they hear any calls of joining levels being vacated. [Typhoon(R1)] was given permission to switch to the Boom frequency at a Flight Level that [the Voyager crew] had not expected, outside their operating block of FL140-170.

A 'Clearance to join', followed by a cancellation from [the Voyager crew] to [Typhoon(R1)], indicated that situational awareness was not high on the joining traffic. The subsequent call from [the Voyager crew] that [Typhoon(F1)] was joining at FL150 matched the expected behaviour of joining traffic and the call of [Typhoon(R1)] climbing FL140 was missed by [Typhoon(F1)].

THE TYPHOON(F1) PILOT did not provide an Airprox report for the incident.

THE VOYAGER PILOT reports that the tasking was in AARA8 in fair weather, day VMC.

Over a 2hr 35min period (0945-1220), 18 receivers were planned to join the tanker in seven formations for a total fuel offload of 58.6T. Once airborne, this increased to 20 receivers for a fuel offload of 64.6T, with several 4-ships reporting as 2x2-ships and unexpected combined formations. [The Voyager] was allocated the block FL140-170, with the tanker positioned at FL160.

In pre-flight planning, the greatest risk was agreed as multiple receivers joining and departing the tanker simultaneously, mitigated by a sterile cockpit to ensure situational awareness and maintaining receivers in their current positions/Flight Levels should there be any safety concerns. On the transit to AARA8, the crew discussed the importance of monitoring joining levels.

During the incident, the following was in progress:

- [Typhoon(H3)] was 1000ft above the tanker with a probe malfunction, rejoining with [Typhoons (H1), (H2) and (H4)] to depart en-route. This resulted in a particularly busy ATC environment as [Typhoon(H3)], initially as a singleton, and then the 3-ship were both negotiating en-route clearance prior to re-joining. All elements of the [Typhoon(H)] formation were visual with each other throughout.
- [Typhoons (F2), (F3) and (F4)], were positioned around the tanker in close formation or refuelling. [Typhoon(F2)] had joined as a singleton over an hour early (they were scheduled at

1200-1220), informing the tanker crew that [Typhoon(F1)] had been delayed and would be joining at a later point. [Typhoons (F3) and (F4)] were a 2-ship formation who were due to visit the tanker twice during the on-task period.

Due to receiver technical issues, there was significant movement around the tanker and increased communications on the Boom frequency (being monitored and controlled by the Pilot Flying (PF) and Mission System Operator (MSO)). Resultantly, the PF and MSO had reduced situational awareness of the [Swanwick Military] frequency as calls were often blocked by the Boom frequency. Consequently, the PF and Pilot Monitoring (PM) were working independently on different radio frequencies for brief periods. As PF, they were informed by the PM that [Typhoons (R1) and (R4)] ([initially tasked] as [R1, R2, R3 and R4]) were about to call visual on the Boom frequency. Having no knowledge that [Typhoon (F1)] was positioned between [Typhoon(R formation)] and the tanker, they cleared them to join, believing them to be at FL150. At that point, [Typhoon(R1)] asked if [Typhoon(F1)] was joining ahead of them and they said *"at some point yes, but not at the moment"*, having no knowledge that [Typhoon(F1)] was in the process of joining. Immediately, the PM mentioned that [Typhoon(F1)] may be joining but they were unsure as [Typhoon(F1)] had not checked in on the Boom frequency. Believing that there may be a conflict, they informed [Typhoon(R1)] to maintain FL150 as that was where they thought they were.

At that point, the crew of [the Voyager] had an internal discussion as to the location of [Typhoon(F1)] (likely the reason their 'visual' call at 1057:11 was missed). In a dynamic situation, the crew realised that [Typhoon(F1)] was above [Typhoon(R1)] and the conflict was identified. Once [Typhoon(F1)] called visual, they cleared them to join.

Following a thorough internal crew debrief after the sortie, and a phone call between [the Voyager] Captain and the Captain of [Typhoon(R1)], the following points were identified that resulted in reduced situational awareness:

1. Boom communications on [the Voyager] were high, attributed to a single receiver departing with a technical malfunction, joined by three departing Typhoons plus three other receivers, [(H) formation], moving around the tanker with further technical issues. This reduced PF and MSO monitoring of the ATC frequency.
2. An extremely busy ATC environment, attributed to two Typhoon[(H) callsigns] negotiating en-route clearance in addition to [Typhoons (F1) and (R1)] requesting vectors and handover to the tanker.
3. Due to a busy frequency, the PM had been unable to pass joining calls to [Typhoons (R1) or (F1)] prior to them being transferred to Boom by ATC (the joining call included tanker level, receiver joining level, squawk and TACAN). [Typhoon(R formation)] left the D323 danger area complex at 1055:26 and was instructed to make contact on the Boom frequency at 1056:52, resulting in 1min 26sec in which the PM could have provided a joining call. As the frequency was busy, it is understandable why this was not carried out. Regarding the lack of joining call to [Typhoon(F1)], the PM could not recall why that did not take place.
4. The receivers checked-in on the Boom frequency out of sequence, in joining order [Typhoon(R1)] below at 1056:52 and [Typhoon(F1)] at 1057:55, supporting the incorrect mental model that [Typhoon(R formation)] was ahead of [Typhoon(F1)].
5. As PF, they do not recall seeing either [Typhoon(R formation)] or [Typhoon(F1)] on TCAS.
6. The Voyager had no MIDS and [Typhoon(R1)] was [not receiving data-link information due to equipment malfunction].
7. The PM recalled hearing [Typhoon(F1)] being descended from FL250 to FL200 and believed they had been cleared further to FL150. Until that was established within the crew, [Typhoon(R formation)] was initially instructed to maintain FL150 when a potential conflict was identified and

then FL140, with the tanker crew not knowing that FL150 was vacated throughout and that [Typhoon(R1)] had been cleared in below the Voyager's block at FL130.

8. The Swanwick [controller] had correctly prompted [the crew of the Voyager] several times to request confirmation that joining levels had been vacated. The PM was unsure if FL150 had been called vacated after [Typhoon(F1)] had joined, and this would explain the Swanwick [controller] positioning [Typhoon(F1)] at FL140 and [Typhoon(R) formation] at FL130, however this was not known by the tanker crew.

The pilot perceived the severity of the incident as 'Medium'.

THE SWANWICK (MILITARY) CONTROLLER reports that they had been the TAC-L controller during the incident and instructing a controller under training. However, the trainee had been removed from position before the occurrence due to high traffic levels above their current level of ability.

[The Voyager] was in AARA8, in the block F140-170 with two [Typhoon(H formation)] on the back. Two further [(H formation) Typhoons] joined them at 1037:05.

Timeline:

1025 [Typhoons (F2, F3 and F4)] (3-ship) checked-in abeam Newcastle Airport at FL400 routeing [towards the Voyager] in AARA8 via the Vale of York.

1041:06 [Typhoon(F1)] checked-in 15NM NE of Newcastle Airport at FL400 following [Typhoon(F formation)] to AARA8.

1041:31 [The Voyager crew] called joining level FL150 clear with [Typhoon(H formation)] on the back.

1041:44 [Typhoon(F formation)] was issued a climb to FL150 and instructed to report visual with [the Voyager]. They had previously been descended to FL140 to position for AARA8.

1048:18 [Typhoon(F formation)] called visual and were released to [the Voyager's] Boom frequency at FL150.

1052 Two [Typhoon(R formations)] (2x2-ships) were prenoted leaving D323 for AARA8. [UKAB Secretariat note: The first 2-ship Typhoon(R formation), (Typhoons (R1) and (R4)), is considered below].

10:52:58 [Typhoon(H formation)] called complete with [the Voyager] and requested a climb to FL300 with a routeing to D323. At that stage, they removed the trainee from position and took control.

1053:40 [Typhoon(F1)] was issued a descent to FL140 as [the Voyager crew] had not called joining level FL150 clear.

1054:12 [Typhoon(R formation)] checked-in departing D323 for AARA8. They were instructed to remain inside [the] MDA for 1min. [Typhoon(R formation)] was 10NM north of [the Voyager] at FL130. [Typhoon(F1)] was 27NM NW of [the Voyager] at FL140.

1055:29 [Typhoon(R formation)] was cleared to depart D323.

1055:41 [Typhoon(R formation)] was given a traffic call on [Typhoon(F formation)] and informed "*passing FL190 for FL140, ahead of you to join*".

1056:08 [Typhoon(R formation)] called visual with [the Voyager]. They, the controller, kept them on frequency until inside the confines of AARA8.

1056:52 [Typhoon(R formation)] was released to [the Voyager's] Boom frequency at FL130.

1057:32 [Typhoon(F1)] asked if they were ahead of [Typhoon(R1)] to join [the Voyager], to which they responded that [Typhoon(R1)] was joining currently but were 1000ft below.

1057:39 [Typhoon(F1)] was pushed to [the Voyager's] Boom frequency.

Shortly afterwards, [the second Typhoon(R formation)], a 2-ship, departed D323 for AARA8. They descended them to FL120 to maintain separation with the [Typhoon(F) formation and the first Typhoon(R) pair], as they were squawking standby and the joining levels had not been called clear.

At 1102, following their request, [the Voyager crew] confirmed all joining levels were clear and [Typhoon(R formation)] was climbed to FL150.

For context, [the controller] kept [Typhoon(R formation)] at FL130, below [Typhoon(F1)], as [Typhoon(F formation)] was already on the tanker, and their assumption was that they would be refuelling and departing together. They also had high workload during that period so their priority was ensuring aircraft were correctly and safely separated.

Whilst [the Voyager's] block was FL140-170, aircraft are often released to the Boom frequency at lower levels during busy sessions (with 1000ft separation) to allow the tanker crew to sequence the receivers.

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

Factual Background

The weather at Humberside Airport was recorded as follows:

METAR EGNJ 041050Z 14014KT 9999 BKN012 08/06 Q0997

Analysis and Investigation

Military ATM

Local BM Investigation:

A local investigation was conducted by Swanwick Military following the event to identify the ATS-related causal/aggravating factors and found the controller had carried out safe execution of the tanking procedure and nil further action was required.

2 Gp BM Analysis:

The controller operated in accordance with procedures and applied standard Air Traffic Control practices throughout the event. Although, with additional capacity, supplementary techniques may have been available to further support situational awareness, the operational context did not permit this without detracting from core safety-critical tasks.

UKAB Secretariat

An analysis of the NATS radar replay was undertaken and the Voyager could be positively identified from Mode S data. Several primary-only returns were observed in the vicinity of the Voyager, although these could not be positively identified. The Typhoon crews kindly supplied GPS track data for the flights of Typhoon(R1) and Typhoon(F1). The diagram at the top of this report was constructed and the separation determined from the GPS data.

The pilots of Typhoon(R1) and Typhoon(F1) shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.²

² MAA RA 2307 paragraphs 1 and 2.

RAF Waddington (LEMSCo) Occurrence Investigation

Context: (At 1055)

[UKAB Secretariat note: Figures 1 to 5 have been recreated from those provided in the original occurrence investigation, for use in this report].

[Typhoon(F1)] was heading southbound to the west of D323 and was [tasked] to join for a [refuelling] slot ahead of [Typhoons (R1) and (R4)] but was geographically behind them for the tanker join.

[Typhoon(F formation)], a 3-ship receiving fuel from [the Voyager], arranged for [the Voyager crew] to remain in an orbit to collect [Typhoon(F1)] and agreed with [Typhoons (R1) and (R4)] for [Typhoon(F1)] to receive fuel ahead of them.

[Typhoons (R1) and (R4)], orbiting in the south of D323 waiting for clearance to depart, achieved radar-SA on [Typhoon(F1)] transiting to the west of D323. [They were] assigned FL130 by Swanwick Military and were informed they were number 2 to join behind [Typhoon(F1)].

The [Voyager] was maintaining a left-hand orbit on request of [Typhoon(F formation)] to allow [Typhoon(F1)] to join sooner, at FL160. [They were] assigned the block FL140-170 in the towline (FL140 and FL150 were the designated joining levels). [Typhoon(H formation)] was departing, [Typhoon(F formation)] was receiving. The joining level (FL150) was clear, but this had not been communicated to Swanwick Military.

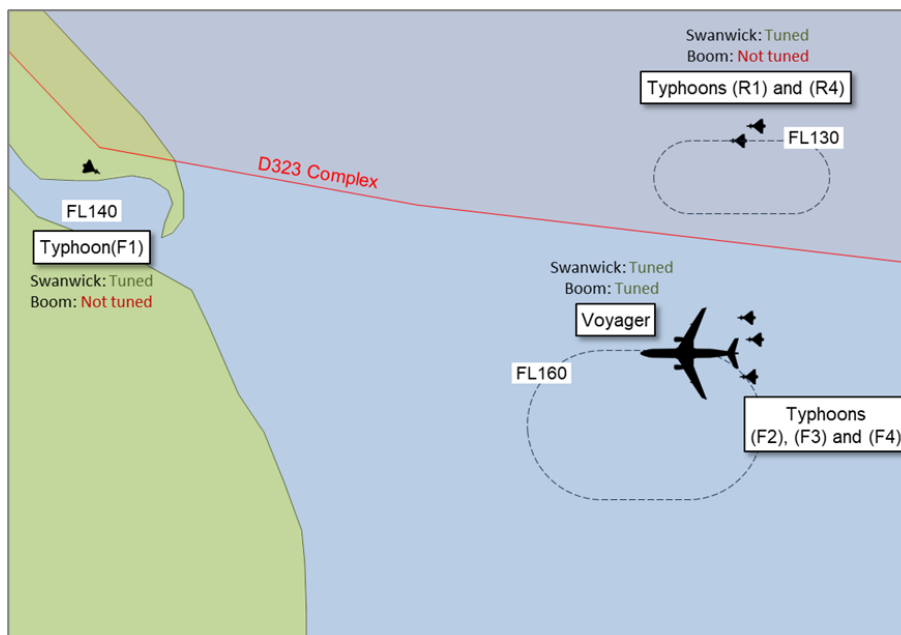


Figure 1 – A schematic representation of the aircraft positions at 1055

Timeline:

Time:	Amplification:
1055:26	
[Typhoons (R1) and (R4)] departed D323 at FL130.	[Typhoons (R1) and (R4)] were allocated FL130 due to Swanwick's perception that the joining level was not clear, and that [Typhoon(F1)] was joining ahead of them.
1055:46	
Swanwick informed [Typhoon(R1)] that [Typhoon(F1)] will be refuelling ahead of [Typhoons (R1) and (R4)].	[Typhoon(R1)] perception: [Typhoon(F1)] was west of the towline but they no longer had on-board, or off-board, SA on [Typhoon(F1)].

	<p>Reality: [Typhoon(F1)] was west of towline. No RV communications were received from the [Voyager crew] by [Typhoon(R1)] on the Swanwick frequency.</p>
<p>1056:52</p> <p>Swanwick frequency: [Typhoon(R1)] called "<i>visual</i>" with the Voyager. Swanwick instructed [Typhoons (R1) and (R4)] to "<i>Squawk standby</i>" and "<i>Push Boom</i>".</p>	<p>[Typhoon(R1)]'s perception: [Typhoon(F1)] was no factor.</p> <p>Reality: [Typhoon(F1)] was no <i>immediate</i> factor, but [Typhoon(F1)] was allocated (and was maintaining) FL140 by Swanwick.</p>
<p>1057:00 (approx.)</p> <p>Boom frequency: [Typhoon(R1)]: "<i>Request join</i>", and the [Voyager] crew subsequently cleared [Typhoon(R1)] to join.</p> <p>[Typhoon(R1)] questioned if [Typhoon(F1)] was joining ahead. The Voyager crew responded "<i>at some point yes, but not at the moment</i>".</p> <p>[Typhoon(R1)]: "<i>Elevating for join</i>".</p>	

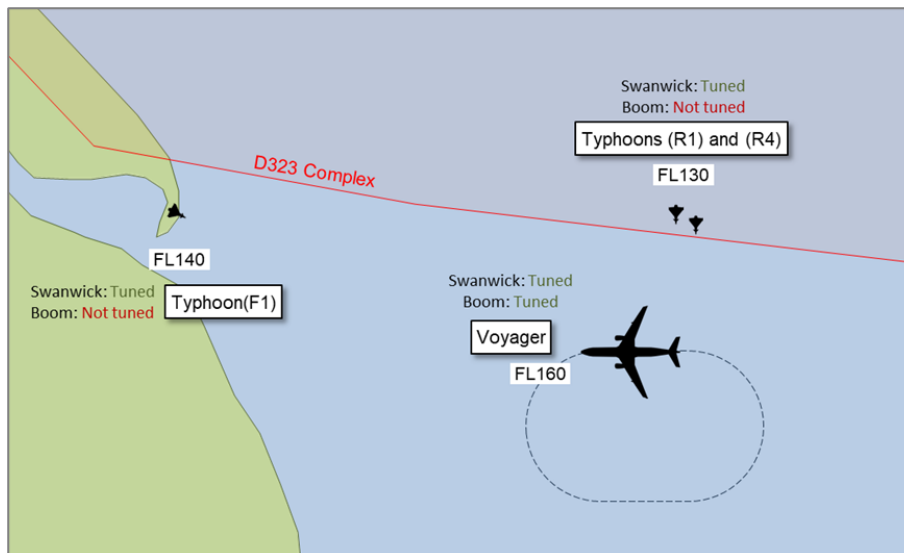


Figure 2 – A schematic representation of the aircraft positions at ~1056

<p>1057:20</p> <p>Swanwick frequency: [Typhoon(F1)]: "[Typhoon(F1)] <i>confirm, am I ahead of [Typhoon(R1)] or behind?</i>"</p> <p>Swanwick responded: "[Typhoon(R1)] <i>joining the tanker now but they are 1000ft below you</i>".</p>	<p>No RV communications were received from the Voyager crew by [Typhoon(F1)] on the Swanwick frequency.</p>
---	---

<p>“[Typhoon(F1)] <i>copied, visual, switching Boom</i>”.</p>	
<p>Concurrently, on Boom frequency: The [Voyager crew] cancelled [Typhoon (R1) and (R4)]’s joining clearance and informed them to “<i>maintain FL150</i>”.</p> <p>[Typhoon(R1)] elected to descend the 2-ship to FL130.</p> <p>[Typhoons (R1) and (R4)] maintained FL130 in 1NM trail behind the [Voyager] and informed the [Voyager crew] that FL130 was their previously assigned level.</p> <p>The [Voyager crew] did not respond to the radio call that [Typhoons (R1) and (R4)] were now maintaining FL130.</p>	<p>The [Voyager crew’s] perception: [Typhoons (R1) and (R4)] were joining ahead of [Typhoon(F1)], and their previous level was FL150.</p> <p>Reality: [Typhoons (R1) and (R4)] were joining at FL130.</p> <p>[Typhoon(R1)]’s perception: The [Voyager crew] had erroneously called FL150 and elected to descend to the level previously cleared with Swanwick.</p> <p>Reality: Assessed as a correct perception.</p> <p>The message from [Typhoon(R1)] to the [Voyager crew] that they were maintaining FL130 was the first transmission heard by [Typhoon(F1)] on the Boom frequency.</p>

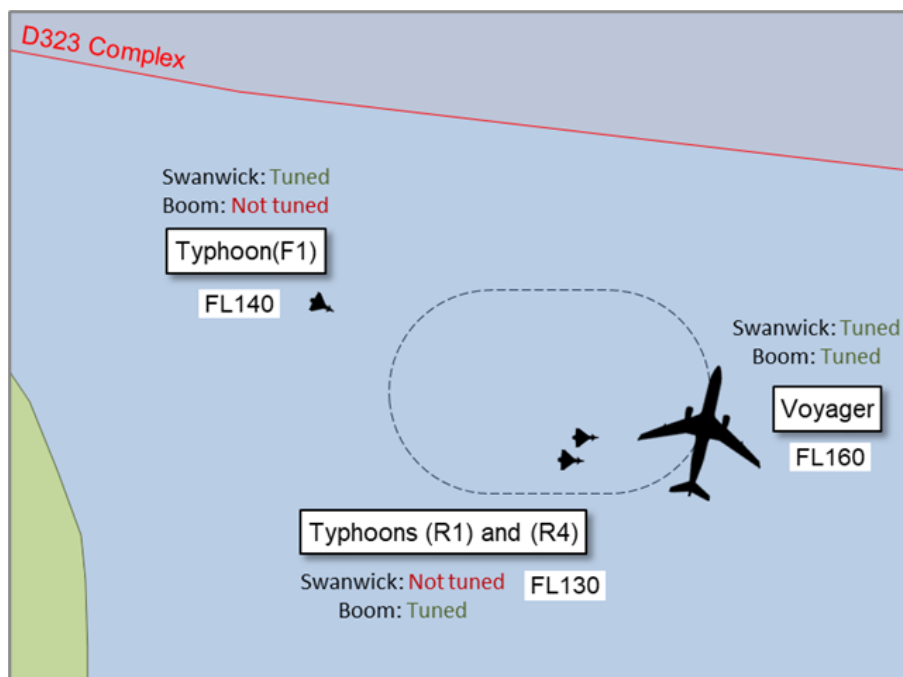


Figure 3 – A schematic representation of the aircraft positions at ~1057

<p>1057:58</p> <p>[Typhoon(F1)] called visual with the [Voyager] and [Typhoons (R1) and (R4)], but the [Voyager crew] did not acknowledge, or provide a clearance to join at that stage.</p>	<p>All aircraft were now on a common frequency: [Typhoons (R1), (R4) and (F1)] were listening out on Boom, but not Swanwick. The [Voyager crew] was listening on both Swanwick and Boom.</p>
<p>1058:20</p> <p>[Typhoon(F formation)] to [Typhoon(R1)]: “[R1] are you happy for [F1] to get on the</p>	

hoses ahead, in front of you guys? Have you got the fuel for that?

[Typhoon(R1)]: *"Affirm, I'm waiting at FL130 to let [F1] ahead"*.

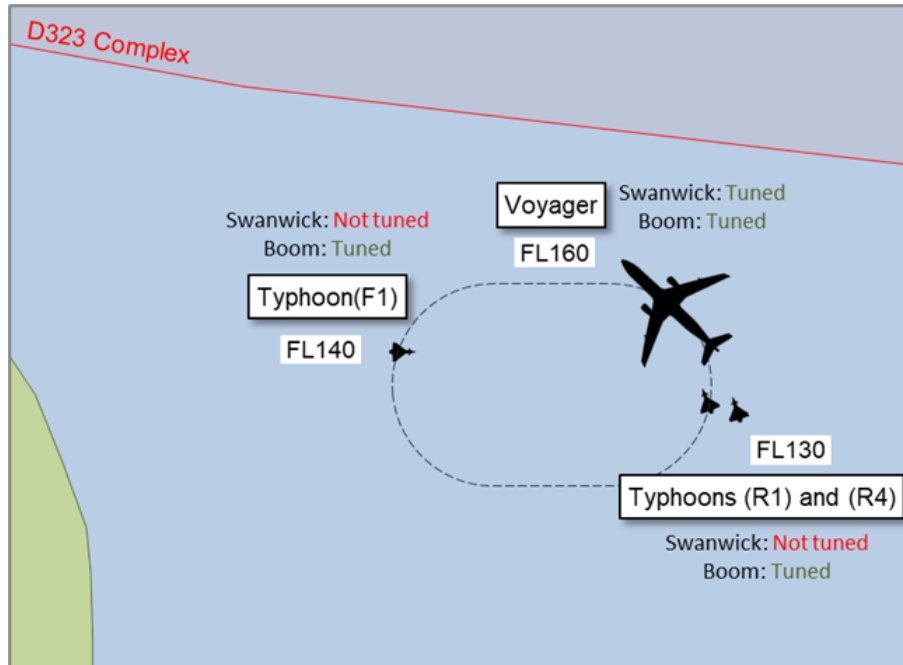


Figure 4 – A schematic representation of the aircraft positions at ~1058

1058:44

[Typhoon(F1)] to [Typhoons (R1) and (R4)]: *"In your 6, visual, FL140"*.

Several radio calls were made by different receivers on the Boom frequency around that time.

1058:54

The [Voyager crew] to [Typhoons (R1) and (R4)]: *"We've got [F1] joining at FL150, so when cleared your level FL140, [F1] has not called visual yet"*.

The [Voyager crew's] perception: [Typhoon(F1)] joining at FL150. [Typhoons (R1) and (R4)] maintaining FL130.

Reality: [Typhoon(F1)] joining at FL140, [Typhoons (R1) and (R4)] were maintaining FL130.

[Typhoon(R1)]: *"[R1] climbing FL140"*.

[Typhoons (R1) and (R4)] initiated a climb to FL140. [Typhoon(R1)] perception: [Typhoon(F1)] was at FL150, which had been cleared with Swanwick. Reality: [Typhoon(F1)] was maintaining FL140 and was not listening on Swanwick frequency.

[Typhoon(R1)] perception: [Typhoon(F1)] had received that communication.

Reality: [Typhoon(F1)] did not hear that radio call, although it was received in-cockpit.

[Typhoon(F1)] perception: [Typhoon(R1)] was maintaining FL130.

Reality: [Typhoon(R1)] was elevating to FL140.

[Typhoon(F1)]: *"Visual, request join"*. [Typhoon(F1)] was subsequently cleared to join by the [Voyager crew].

[Typhoon(R1)] asked [Typhoon(F1)] if they were still visual, to which [Typhoon(F1)] confirmed that they were (although, to [Typhoon(F1)], the callsign was clipped).

That response gave [Typhoon(R1)] false confidence that [Typhoon(F1)] was aware that they were climbing to FL140. [Typhoon(F1)] believed they were responding to the [Voyager crew].

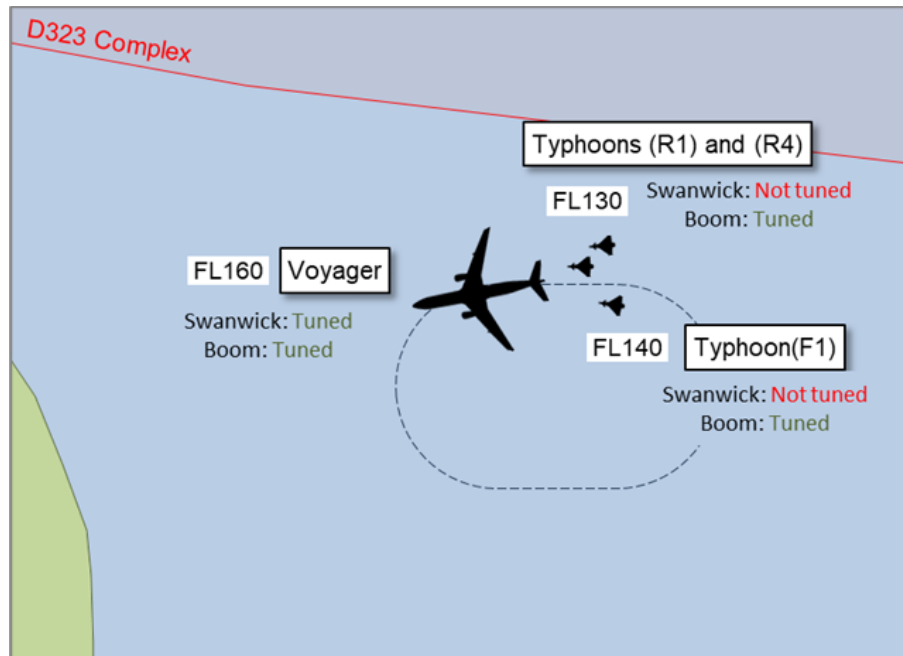


Figure 5 – A schematic representation of the aircraft positions at ~1059

Detailed events sequence 1057:40-1059:30:

1057:40

[Typhoon(F1)] switched to the Boom frequency and initiated Join-comm which was not responded to by [the Voyager crew]. The first transmission heard on the Boom frequency by [Typhoon(F1)] was [Typhoon(R1)] confirming they were level at FL130.

Typhoon(R1): 1057:40: Boom frequency: "[Typhoon(R1)] *maintaining FL130*".

Typhoon(F1): 1057:55: Boom frequency: "[Voyager], [Typhoon(F1)] *hello, visual with you and [Typhoon(R)] 2-ship in trail*".

Voyager crew: 'no response'.

1058:44

[Typhoon(F1)] confirmed to [Typhoon(R1)] that they were visual. [The Voyager crew] incorrectly informed [Typhoon(R1)] of [Typhoon(F1)]'s joining level. [Typhoon(R1)] perceived [Typhoon(F1)] to be at FL150 and initiated a climb to FL140. [Typhoon(R1)]'s climbing transmission was not heard by [Typhoon(F1)].

Typhoon(F1): 1058:44: Boom frequency to Typhoons (R1 and R4): "*In your 6, visual, FL140*".

Voyager: 1058:54: Boom frequency to Typhoons (R1 and R4): "*We've got [Typhoon(F1)] joining at FL150, so when cleared your level FL140, [Typhoon(F1)] has not called visual yet*".

Typhoon(R1): 1059:05: Boom frequency: "[Typhoon(R1)] *climbing FL140*".

1059:07

[Typhoon(F1)] re-initiated Join-comm. [Typhoon(F1)] responded to a clipped callsign requesting confirmation of visual status ([Typhoon(F1)] believed they were responding to the [Voyager crew]). [Typhoon(F1)] was unaware of [Typhoon(R1)]'s climb.

Typhoon(F1): 1059:07: Boom frequency: "[Typhoon(F1)] Visual, request join".

Voyager: 1059:11: Boom frequency: "[Typhoon(F1)] clear join".

Typhoon(R1): 1059:15: Boom frequency: "[Typhoon(F1)] confirm visual?".

Typhoon(F1): 1059:20: Boom frequency: "Affirm, visual [Typhoon(F1)]".

1059:30

[Typhoon(R1)] became visual with [Typhoon(F1)] at a visually judged separation of 300ft. [Typhoon(R1)] took avoiding action. [Typhoon(F1)] was unaware of [Typhoon(R1)]'s proximity, although their LHW (Low Height Warner) was activated and their RadAlt momentarily read 740ft.

Root cause analysis:

- The Voyager crew did not communicate to Swanwick that the joining level (FL150) was clear, which led to the Swanwick controller assigning unexpected altitude blocks for [Typhoon(F1)] (FL140) and [Typhoon(R1)] (FL130) for their joins.
- [Typhoon(R formation)] was, initially, two-dimensionally ahead of [Typhoon(F1)] for the [refuelling] join but was assigned number two in the join by Swanwick.
- Swanwick assigned [Typhoon(R1)] FL130, which was not one of the Voyager crew's assigned joining levels (which were FL140 and FL150).
- The Voyager crew never transmitted SOP RV communications to [Typhoon(R1)] or [Typhoon(F1)] on the Swanwick frequency, meaning the opportunity for the Swanwick controller and the Voyager crew to notice a difference in expected joining levels was missed.
- The Voyager crew did not fully understand which callsigns were joining at which Flight Levels.
- The Voyager crew incorrectly communicated to [Typhoon(R1)] that [Typhoon(F1)] was joining at FL150 and stated they can climb to FL140 "*when cleared*". [Typhoon(R1)] incorrectly assumed that [Typhoon(F1)] had clearance to elevate to FL150 with Swanwick. [Typhoon(R1)] and [Typhoon(F1)] were not listening out on the Swanwick frequency at that stage.
- It is normal procedure for [Typhoon pilots] to listen to either ATC or Boom frequency, [consequently], [Typhoon(R1)] perceived that [the communication highlighted in the previous point] had been a clearance to climb. [Typhoon(R1)] initiated a climb to FL140 based on that clearance and incorrect SA of [Typhoon(F1)]'s Flight Level from the Voyager crew.
- [Typhoon(F1)] did not hear [Typhoon(R1)]'s transmission informing the Boom frequency of their intention to climb to FL140.

Lessons identified:

1. Tanker crews communicating that the joining level is clear is important for aircraft to be assigned SOP altitudes for the join and help prevent SA breakdown.

Neither Swanwick, [Typhoon(F1)], nor [Typhoon(R1)] received the 'joining level clear' communication from the Voyager crew, which prevented any formation being allocated FL150

as their joining level by Swanwick. This directly led to the confusion on the Boom frequency since the Voyager crew believed that [Typhoon(F1)] was joining at FL150.

2. Tanker RV communication on the controlling ATC frequency [provides] important SA for joining [pilots], as well as the controller.

The Swanwick controller and the Voyager crew did not have a common understanding of the Flight Levels of the joining aircraft. Those SOP transmissions would have communicated the discrepancy to all callsigns and initiated an early resolution.

3. Fighters should be permitted to join the tanker in the order that makes sense based on instantaneous geographical position, rather than the order in which they requested a join. Letting [pilots] ahead to conduct [refuelling] first can be arranged on the wing of the tanker, assuming no more than four aircraft will be waiting for [refuelling].

In this scenario, [Typhoons (R1) and (R4)] could have joined the tanker first from FL150 and waited on the wing for [Typhoon(F1)] to complete the join and conduct [refuelling] ahead of them. It is SOP for Swanwick [controllers] to assign the joining order based on who contacts the frequency first, rather than their relative position to another joining callsign.

Comments

HQ Air Command

While all successful AAR ultimately ends in a 'Mid-Air Collision', this is ideally with the explicit consent of both parties! This incident is the latest in a significant number of recent events where there has been a reduction in safety margins or Loss of Safe Separation as receivers have joined, departed or manoeuvred around the tanker during AAR operations. The confusion between crews and ATC as to who was joining at what level was compounded by poor communications and a confused air picture. This was exacerbated by the tanker not having a serviceable data-link display. Following this incident, Combat Air Stanevals and Air Mobility AAR SMEs were tasked with reviewing and updating AAR procedures. New AAR training packages have since been issued to both forces and briefed at a force-wide training day. Lastly, all Combat Air Pilots have been reminded of the requirements, in accordance with MAA RA1410, to submit their own separate Airprox report if they are involved in an Airprox incident, to aid investigation and analysis of the event for future learning.

Summary

An Airprox was reported when two Typhoons flew into proximity 32NM east of Grimsby at 1100Z on Thursday 4th December 2025. Both pilots were operating under VFR in VMC, communicating on the Voyager Boom frequency.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available consisted of reports from the pilots of Typhoon(R1) and the Voyager, radar photographs/video recordings, GPS track data for the flights of both Typhoons, a report from the air traffic controller involved and reports from the relevant 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 context of the incident, and a member with particular knowledge of military operations explained that a large force exercise had been undertaken which had involved making extensive use of air-to-air refuelling. It was explained that the situation had been highly dynamic and had required careful management. Joins to, and departures from, the refuelling area were to be controlled by the Swanwick military controller. The crew of the Voyager had had a co-ordinating function, clearing pilots to 'elevate to join' for refuelling. It was also explained that, on this particular day, some pilots had had technical issues with certain data-link systems which had placed a greater

emphasis on the making and receiving of radio calls in order to acquire situational awareness. The crew of the Voyager had tuned their radios to both the Boom frequency and the Swanwick Military frequency, whereas the Typhoon pilots typically switched from the Swanwick military (once cleared to the refuelling area) to the Boom frequency to await a clearance to approach the Voyager for fuel.

Members commended the extensive military investigation provided to the Board which had highlighted several moments that had ultimately resulted in the unintended close proximity of Typhoons (F1) and (R1). Although it was noted that the pilot of Typhoon(F1) had not provided an Airprox report for the incident, it was recognised that they had contributed to the local investigation.

Turning to the events preceding the Airprox, members noted that the pilot of Typhoon(F1) had requested to refuel ahead of Typhoon(R1), and members considered the interaction between the Voyager crew and the Swanwick controller. It was noted that the crew of the Voyager had believed that Typhoon(F1) had been inbound to them at FL150, whereas they had actually been issued a descent to FL140 several minutes earlier by the Swanwick controller. Members noted that the Voyager crew had not communicated that the joining level of FL150 had been clear, and agreed that the Swanwick controller had incomplete, generic situational awareness of which levels had been occupied and which had been available (CF2).

Focussing on the interaction between the crew of the Voyager and the pilot of Typhoon(R1), members noted that, at 1058:54, the Voyager crew had communicated that “*We’ve got [Typhoon(F1)] joining at FL150, so when cleared your level FL140*”. Members agreed that the Voyager crew and the pilot of Typhoon(R1) had had inaccurate situational awareness of the Flight Level for Typhoon(F1) (CF7). Members also agreed that the phrase “*when cleared*” had not been assimilated, or had been misunderstood, by the pilot of Typhoon(R1) (CF5) and that they had subsequently climbed to FL140 without clearance to have done so (CF3). Notwithstanding, it was noted that the pilot of Typhoon(R1) had announced on frequency that they were “*climbing FL140*”. However, members agreed that the Voyager crew had not heard (or had not assimilated) that call, and neither had the pilot of Typhoon(F1) (CF6). Consequently, members agreed that the mental model held by the pilot of Typhoon(F1) had been that Typhoon(R1) had been at FL130 (having heard that the pilots of Typhoons (R1) and (R4) had descended to FL130 after their join to the Voyager had been cancelled approximately a minute-and-a-half earlier). It was therefore agreed that the pilot of Typhoon(F1) had had inaccurate situational awareness of the Flight Level occupied by Typhoon(R1) (CF7).

Members next considered the interaction between the pilot of Typhoon(F1) and the pilot of Typhoon(R1). It was noted that they had transmitted to the pilot of Typhoon(R1) that they had been “*In your 6, visual, FL140*”, and that that had been at a moment when both aircraft had been tracking approximately south-east, just before both pilots had turned left towards the Voyager. However, it had been subsequent to those turns that the pilot of Typhoon(R1) had announced that they were climbing to FL140 (the call that members had previously agreed had been missed by the pilot of Typhoon(F1)). Consequently, members were in agreement that it had been most likely that the pilot of Typhoon(F1) had subsequently lost visual contact with Typhoon(R1), with it having been obscured beneath their wing as they had turned (CF9) and had not sighted it again until after the moment of CPA which had occurred approximately 30sec later (CF8).

The pilot of Typhoon(F1) had transmitted to the Voyager crew, “*Visual request join*” and had been subsequently issued a clearance to join. Members noted that the pilot of Typhoon(R1) had then asked the pilot of Typhoon(F1) to confirm that they were still visual (having intended the meaning of their call to have been ‘are you still visual with Typhoon(R1)?’). However, members noted that, as their callsign had been clipped from their transmission, the pilot of Typhoon(F1) had believed that that call had been made by the crew of the Voyager. Members agreed that the clipped callsign had caused confusion (CF4). The response to the call had been in the affirmative (as they had been visual with the Voyager) but that had inadvertently misled the pilot of Typhoon(R1) to have believed that they had maintained visual contact with them. Members agreed that the pilot of Typhoon(R1) had climbed to FL140 with an understanding that the pilot of Typhoon(F1) had been at FL150, that their climb to FL140 had been assimilated, and that the pilot of Typhoon(F1) had maintained visual contact with them during their climb. Members agreed that that had not been the case, and surmised that, converging from below and from the right, the pilot of Typhoon(R1) had not sighted Typhoon(F1) until the moment of CPA (CF8).

Concluding their discussion, it was clear to members that the frequencies in use had been heavily congested (**CF1**) and that that had played a major part in the reduction of effective communication and, consequently, a reduction of accurate situational awareness. Summarising their thoughts, members noted that there had been significant confusion between the occupied and vacant Flight Levels:

The pilot of Typhoon(F1), at FL140, believed that Typhoon(R1) had been maintaining FL130. The pilot of Typhoon(R1), when climbing to FL140, had believed that Typhoon(F1) had been at FL150. The crew of the Voyager had also believed that Typhoon(F1) had been at FL150, and that Typhoon(R1) had been at FL130.

Having previously agreed that neither Typhoon pilot had seen the other aircraft in time to have taken avoiding action, members were in agreement that the separation between Typhoon(R1) and Typhoon(F1) had been largely providential. The Board concluded that there had been a risk of collision (**CF10**) and assigned Risk Category B to this event.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2025246			
CF	Factor	Description	ECCAIRS Amplification	UKAB Amplification
Ground Elements				
• Situational Awareness and Action				
1	Contextual	• Frequency Congestion	An event involving frequency congestion that reduces the effectiveness of communications	
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	• Action Performed Incorrectly	Events involving flight crew performing the selected action incorrectly	Incorrect or ineffective execution
• Situational Awareness of the Conflicting Aircraft and Action				
4	Human Factors	• Flight crew callsign confusion	Callsign confusion by the flight crew	
5	Human Factors	• Flight crew response to communications	An event related to the flight crew taking the incorrect action following communication	
6	Human Factors	• Monitoring of Communications	Events involving flight crew that did not appropriately monitor communications	
7	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
• See and Avoid				
8	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
9	Contextual	• Visual Impairment	Events involving impairment due to an inability to see properly	One or both aircraft were obscured from the other
• Outcome Events				
10	Contextual	• Near Airborne Collision with Aircraft	An event involving a near collision by an aircraft with an aircraft, balloon, dirigible or other piloted air vehicles	

Degree of Risk: B.

Safety Barrier Assessment³

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

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 **ineffective** because the Swanwick Military controller had incomplete situational awareness of the occupied and available Flight Levels.

Flight Elements:

Tactical Planning and Execution was assessed as **ineffective** because the pilot of Typhoon(R1) had climbed to FL140 without clearance from the Voyager crew.

Situational Awareness of the Conflicting Aircraft and Action were assessed as **ineffective** because neither the Voyager crew, nor the pilot of Typhoon(F1), had heard (or had not assimilated) the radio call made by the pilot of Typhoon(R1) concerning their climb to FL140.

See and Avoid were assessed as **ineffective** because the pilot of Typhoon(F1), during their turn on to the heading of the tanker, had not sighted Typhoon(R1), and the pilot of Typhoon(R1) had not sighted Typhoon(F1) until the moment of CPA.

