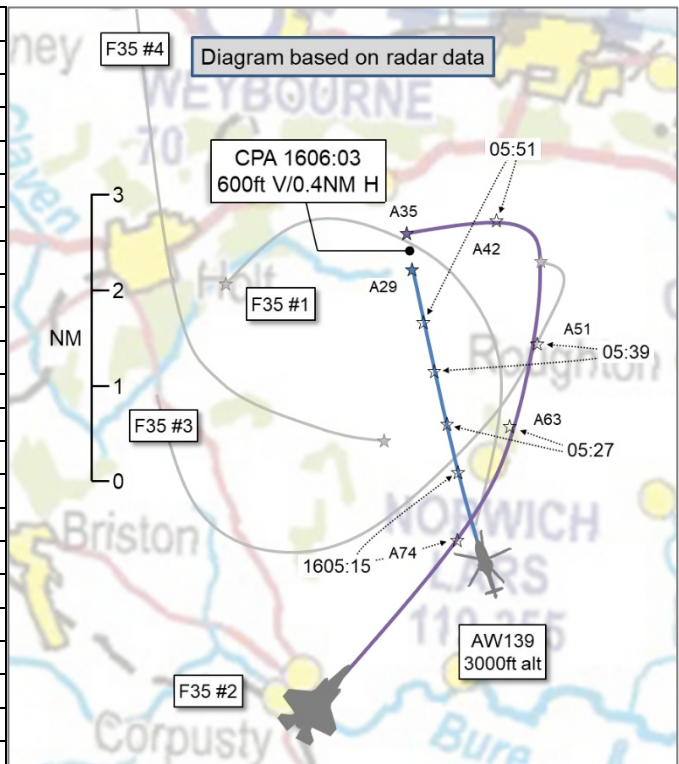


**AIRPROX REPORT No 2021008**

Date: 24 Feb 2021 Time: 1606Z Position: 5254N 00110E Location: 14NM NNW Norwich

**PART A: SUMMARY OF INFORMATION REPORTED TO UKAB**

Recorded	Aircraft 1	Aircraft 2
Aircraft	AW139	F35 #2
Operator	Civ Helo	HQ Air (Ops)
Airspace	London FIR	London FIR
Class	G	G
Rules	IFR	VFR
Service	Traffic	Traffic <sup>1</sup>
Provider	Norwich	Marham
Altitude/FL	2900ft	3400ft
Transponder	A, C, S	A, C (S off)
<b>Reported</b>		
Colours	Blue, white, red	Grey
Lighting	NR	Strobe, position
Conditions	VMC	VMC
Visibility	>10km	50km
Altitude/FL	3000ft	3700ft
Altimeter	NR	QFE <sup>2</sup> (1017hPa)
Heading	350°	240°
Speed	140kt	300kt
ACAS/TAS	TCAS I	Not fitted
Alert	TA	N/A
<b>Separation</b>		
Reported	500ft V/0m H	700ft V/0.4NM H
Recorded	600ft V/0.4NM H	



**THE AW139 PILOT** reports being in straight and level cruise when they were warned by ATC of an area of intense aerial activity ahead; 4 x F35's with garbled squawks at or above FL100. ATC said they would report if they descend. ATC had a short term conflict alert in amber so they advised that the F35's were descending and gave positions, but radar overlay of Mode S was garbled due to proximity. After becoming visual with the first aircraft, the AW139 pilot elected to descend from 3000ft to 2700ft, and then further to 2500ft. They became visual with 3 of the 4 F35s. The AW139 pilot noted that although they were 'good visual outside', they had been flying straight and level for the preceding 15 miles so the F35 actions were inappropriate. The first aircraft, which passed ahead by about a mile, was about 300ft above and was the reason for the descent to 2500ft. The second aircraft came directly over them at a visually assessed 300ft separation. The co-pilot noted that the TCAS indicated 500ft separation.

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

**THE F35 PILOT** reports leading a 4-ship formation flight as part of a Qualified Flying Instructor course. On recovery, in 2NM trail, the leader passed about 2NM in front and 1000ft above a helicopter without previously having Situational Awareness (SA) on it. The number 2 gained SA, saw the helicopter, levelled above its indicated altitude and passed in front. The number 2 passed the traffic to number 3 who maintained 1000ft above the helicopter's altitude. Number 4 also maintained lateral and vertical deconfliction.

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

**THE NORWICH CONTROLLER** reports that the AW139 pilot was transiting offshore at 3000ft and was given Traffic Information on 4 military aircraft manoeuvring in their area at medium level (their squawk

<sup>1</sup> Reduced due to clutter.

<sup>2</sup> Marham airfield elevation 76ft, ~3hPa.

codes indicated that they were under the control of Marham). The military aircraft subsequently descended, the AW139 pilot was updated on the traffic and the pilot stated that they were visual with 3 out of the 4. The AW139 then descended 500ft to avoid potential conflict with one of the military jets which flew overhead. The pilot completed the flight, returned to Norwich sometime later, and filed an Airprox.

**THE MARHAM CONTROLLER** reports that they had 4 F35s on frequency conducting GH near the north Norfolk coast. As well as routinely calling traffic on nearby Typhoons, the F35s were subject to co-ordination against an aircraft departing from Norwich not above FL70 (F35's not below FL80). At this point the F35s called complete and intended to self-position for a visual straight-in approach, to which the controller responded, 'Own navigation, descent approved, report visual with the aerodrome'. The controller felt that the co-ordination with Norwich in conjunction with busy airspace and moderate levels of radar clutter diminished the visibility of the rotary aircraft, resulting in no Traffic Information being passed. No RT was received from the F35s in relation to the incident and they were transferred to Tower as per the procedure.

**THE MARHAM SUPERVISOR** reports that they received a phone call from Norwich ATC, stating that a Norwich outbound helicopter was filing an Airprox against 4 F35s. The controller at the time had gone off duty but the supervisor spoke with them at a later date. They had no recollection of the helicopter traffic when releasing the F35s to descend for their visual inbound and so couldn't comment on any relative positions or levels.

## Factual Background

The weather at Norwich was recorded as follows:

```
METAR COR EGSB 241620Z 17010KT 120V210 9999 FEW025 14/09 Q1021 NOSIG=
METAR COR EGSB 241550Z 17011KT 130V210 9999 FEW025 15/09 Q1021 NOSIG=
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TAF EGSB 241358Z 2415/2424 19014KT 9999 FEW025 PROB40 TEMPO 2415/2424 20017G27KT=
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## Analysis and Investigation

### CAA ATSI

The Norwich controller reported being aware of the F35s operating at medium level and had passed generic Traffic Information to the AW139. During a period when they were dealing with other traffic, they reported receiving an amber STCA alert which went on to become red. It was at this point that they attempted to pass more specific Traffic Information but were initially hampered by the close proximity of all the aircraft and SSR label garbling on their radar data display. The unit investigation report confirmed that the controller subsequently reduced the radar range on their display to help distinguish the positions of the individual aircraft. The investigation concluded that the controller provided accurate Traffic Information but might have considered reducing the range earlier to help reduce the garbling of the SSR labels.

Without direct access to the Norwich radar recordings, and with no snapshots having been included in the Norwich unit investigation report, ATSI were unable to determine at what point the STCA alerted the controller. According to the area radar replay, the F35 flight commenced their descent at 1603:42, however it wasn't until 1604:40 that the controller passed the first set of (generic) Traffic Information to the AW139 on the presence of the flight of F35s, referring to them only as "intense military activity". By that point, the lead F35 was only 2.8NM to the west of the AW139 and 6000ft above in a descent. At 1605:00 that F35 passed directly over the top of the AW139 separated vertically by 4000ft with the second also approaching on a similar track and descent profile. The controller went on to pass further Traffic Information to the AW139 but it remained generic, advising only that the aircraft were "in your vicinity". There was no use of the "clock method" or reference to cardinal points by the controller when they passed the Traffic Information. However, by 1605:38 the controller did start to pass more specific Traffic information, which is suggestive of them having by

then reduced the radar display range. The Traffic Information passed did apparently enable the AW139 pilot to visually acquire the first and subsequently the second (and conflicting) F35.

ATSI agreed with the Norwich investigation report in that the controller might have considered reducing the radar range earlier to alleviate the SSR label garbling. However, the generic Traffic Information was passed over a minute after the flight of F35s had commenced their descent. The information about intense military activity could have been passed either before or as the AW139 was leaving the Norwich CTA, with a further update when initial descent was commenced by the F35 flight. The dynamics of military aircraft manoeuvres often leaves less time in which to pass appropriate Traffic Information to enable other pilots to visually acquire the traffic.

### Military ATM

The Approach Controller was providing a Traffic Service to the formation of F35s conducting general handling in the vicinity of the north Norfolk coast and reported that the F35s had been previously subjected to coordination against a Norwich departure [not the Airprox AW139]. The general complexity of the task was assessed as medium and the workload was considered as low with one other track under the Approach controller's control. Traffic Information was being routinely called by the Approach controller relating to another formation of fast jets operating near to the F35s. The F35s reported complete and we're given own navigation and an approval to descend for their self-positioned straight-in approach. The radar picture on the day was particularly poor and the Traffic Service was reduced for poor radar performance. The controller had no recollection of the AW139, and Traffic Information was not passed. In the subsequent unit investigation, it was identified that the Aerodrome controller had observed the AW139 on the Air Traffic Monitor.

The Norwich controller reported that they passed Traffic Information to the AW139 about the formation of F35s which was made more difficult by the SSR label clutter, however, the Traffic Information helped the AW139 pilot become visual.

Figures 1-4 show the positions of the F35s and the AW139 at relevant times during the Airprox. The screen shots are taken from a replay using the NATS radars, which are not utilised by Marham, and therefore, may not be entirely representative of the picture available to the Marham controller.

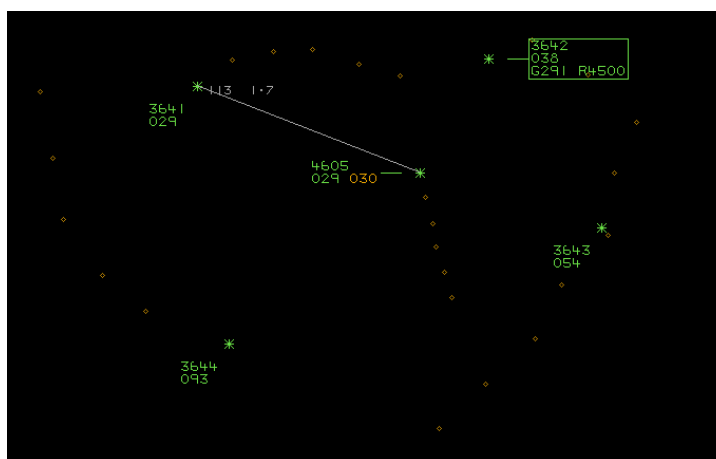


Figure 1: Flight profile for No1 F35.

No1 F35 flew anti-clockwise in front of the AW139 in the descent. The F35 was north of the AW139 by 1.1NM before less than 3000ft separation was measured which increased to 1.4NM in the next radar sweep. The No1 F35 maintained a minimum of 1.1NM (mostly 1.5NM) separation in the descent.

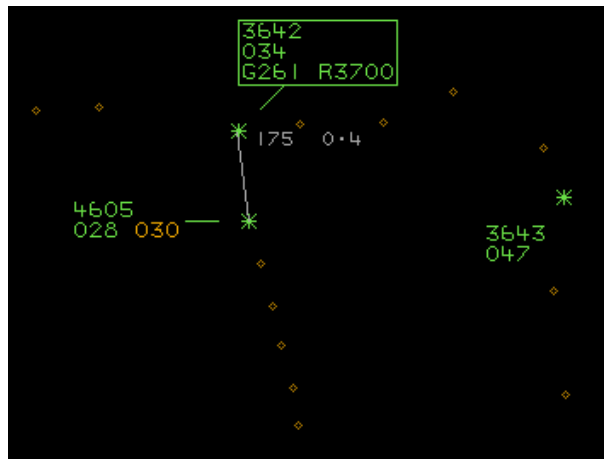


Figure 2: CPA No2. F35.

No2 F35 followed the same profile as the No1 F35. Between the transit of No1 F35 to the north of the AW139 and No2 F35 CPA the No1 F35 informed the Approach controller of the formation's intention to depart after their visual approach. CPA was measured at 0.4NM and 600ft.

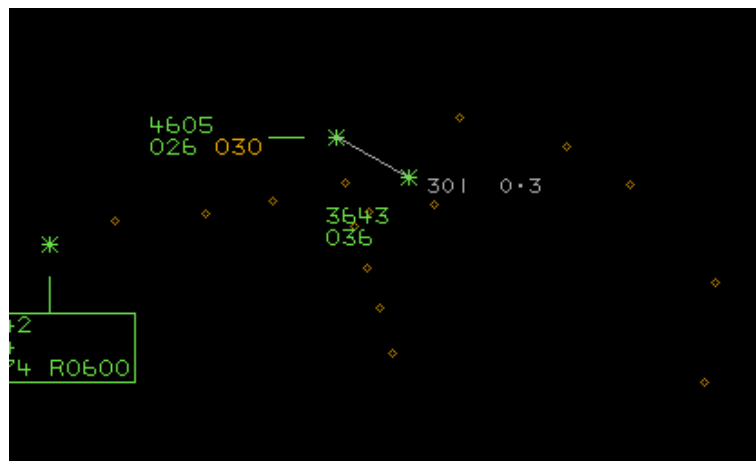


Figure 3: CPA No3. F35.

No3 F35 also followed the same profile as No1 and 2 F35s, CPA measured at 0.3NM and 1000ft.

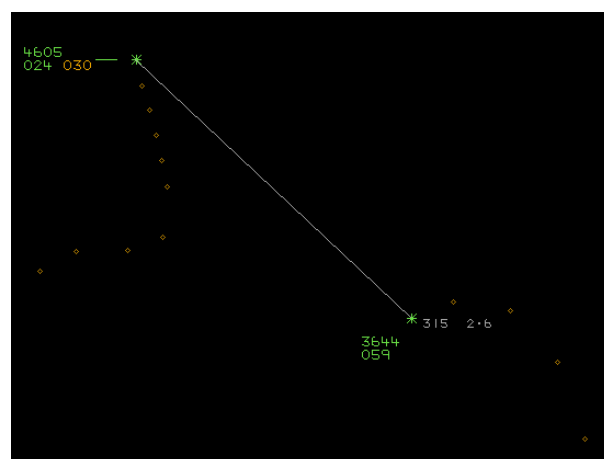


Figure 4: CPA No4. F35.

Although the same profile was followed for No4 F35 the AW139 had tracked much further north and CPA was measured at 2.6NM and 2500ft

Although the traffic levels being controlled by the Marham controller were not particularly high, there was a degree of complexity added to the situation due to the proximity of conflicting fast jets and poor radar performance requiring Angels Suppression Filtering. It was noted during the unit investigation that the Aerodrome controller observed the AW139 on their Air Traffic Monitor, therefore, it can be assumed that the aircraft was visible on the Approach Controllers radar screen. However, it is unclear whether the contact was prominent and unobscured by clutter. Just prior to No2 F35 CPA the No1. F35 informed the Approach controller that the formation would be departing the visual circuit after their approach requiring the controller to provide departure instructions. There is potential that this could have distracted the controller from scanning and effectively identifying the ongoing situation while they noted the given departure details.

### **UKAB Secretariat**

The AW139 and F35 #2 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.<sup>3</sup> If the incident geometry is considered as converging then the AW139 pilot was required to give way to the F35 #2.<sup>4</sup>

CPA with the lead F35 occurred at 1605:47, 200ft V/1.6NM H, and with F35 #3 at 1606:19, 1000ft V/0.3NM H. Using the radar derived figures, this resulted in slant ranges with F35s 1 to 3 of 9200ft, 2500ft and 2100ft respectively. The smallest CPA was therefore with F35 #3, however, the Airprox was reported with F35 #2 and that event is the basis of this report.

### **Norwich Occurrence Investigation**

The AW139 pilot was receiving a Traffic Service in VMC in Class G airspace north of Norwich CAS, having departed Norwich Airport en-route to the North Sea. The ATCO gave [AW139 C/S] Traffic Information on 4 military aircraft (F35s from RAF Marham) operating in the vicinity of Weybourne under the control of RAF Marham ATC. As the F35s began descent from FL50, further Traffic Information was passed on the military aircraft, resulting in [AW139 C/S] sighting one F35. The Captain of [AW139 C/S] immediately elected to increase vertical separation by descending to 2,700ft; an additional descent to 2,500ft was taken to further increase separation as the military aircraft passed about 1 mile ahead in a continued descent to the west. Two more F35 aircraft were then sighted and [AW139 C/S] assessed that an F35 passed directly overhead with about 500ft height separation (TCAS height read-out). The third F35 was seen to pass to the rear; the last F35 was not sighted but was assessed as remaining clear. The controller endeavoured to give timely and accurate Traffic Information throughout the incident, but this was made more difficult with the SSR label clutter generated by 5 aircraft being in close lateral proximity on the radar display. Radar display range was reduced to help reduce the clutter and [the controller] was able to give accurate Traffic Information throughout as evidenced by the pilot stating that he was visual with the 3 aircraft involved.

Causal factor(s): Late sighting of helicopter traffic by the F35 pilots in Class G airspace.

Recommendation(s): Norwich Radar controller did all [they] could to mitigate the risks of operating within Class G airspace by providing timely Traffic Information and [the AW139 pilot] reacted to Traffic Information given. The East Anglian Airspace Users Working Group is a good forum to increase safety and understanding of all operators. A representative from the North Sea Helo Operators should be invited to attend.

### **Marham Occurrence Investigation**

[F35 formation] (4 ship F-35B Lightning) were descending from the Block FL50-190 in 2-mile trail formation under Traffic Service (Reduced) from RAF Marham Approach for visual recovery on Marham QFE 1017 heading approx. 240°. Traffic Information on a pair of FJ aircraft ahead was attracting deconfliction focus for [F35 formation] as an on-board system track file on a Norwich

<sup>3</sup> SERA.3205 Proximity. MAA RA 2307 paragraphs 1 and 2.

<sup>4</sup> SERA.3210 Right-of-way (c)(2) Converging. MAA RA 2307 paragraph 12.

outbound aircraft (assessed as [AW139]) was generated, then stalled, for [F35 #2]. No corresponding point out data was relayed by RAF Marham ATC with the FJ activity remaining the focus of Traffic Information supplied to [F35 formation]. At this point, the look-out scans by the 4 pilots of [F35 formation] had not detected [AW139], nor its closing tangential flightpath. [F35 #2] system re-generated a track file and cued the pilot to a late visual acquisition (circa 6 secs) of [AW139] at BRAA [Bearing, range, altitude and aspect] 181°/0.4NM/354°; descent was immediately stopped at 3,600ft before climbing to level at 3,700ft to ensure vertical separation. System assessed as 700ft MSD, on passing in the near overhead of [AW139]. [F35 #2] quickly communicated with trail elements, passing information to [F35 #3] (who remained at 4,000ft) and [F35 #4] (last in trail) to ensure wider formation separation, with both assessed as no factor threat to [AW139]. [F35 formation] were not in 2-way contact with Norwich Radar. Lightning F-35 aircraft are not fitted with TCAS.

Marham ATC were providing [F35 formation] with an ATS whilst operating in Class G airspace. They had cleared them to operate in the Block FL50-190 and had earlier received traffic co-ordination from Norwich Radar against their outbound traffic, towards and into [F35 formation] operating Block, with agreed height deconfliction for [F35 formation] to operate not below FL80. [F35 formation] were subsequently re-cleared for own navigation and descent for a visual recovery with Traffic Information (Reduced) and were informed of dynamic manoeuvring FJ traffic ahead of the formation. The focus on deconflicting the descending [F35 formation] from the dynamic FJ traffic, combined with significant radar screen return clutter possibly shielding the presence of the [AW139] return, contributed to the Marham ATC Approach controller not detecting the helicopter track. Consequently, no [Traffic] Information was passed to [F35 formation] regarding the closing flightpath of [AW139]. However, the SSR data group for [AW139] had been seen by the Tower controller on the [Air Traffic Monitor] in the Visual Control Room and they assumed that this traffic had been passed to [F35 formation]. RAF Marham were not 2-way with Norwich Radar or [AW139] at the time of the Airprox. Separate ATS were being provided to both callsigns as they each operated in Class G airspace. Despite this ATS provision, [AW139] and [F35 formation] continued to close upon each other, with [F35 formation] receiving no off-board traffic warning and [AW139] making the first, and largest, positive height separation movement after becoming tally traffic with the lead 3 aircraft of the 4-ship. It is assessed that the height CPA between [AW139] and [F35 #2] was between 500-700ft in the near direct overhead, with each aircraft finally in sight of each other, and both having made positive control measures to provide additional height separation in the latter stages of closure.

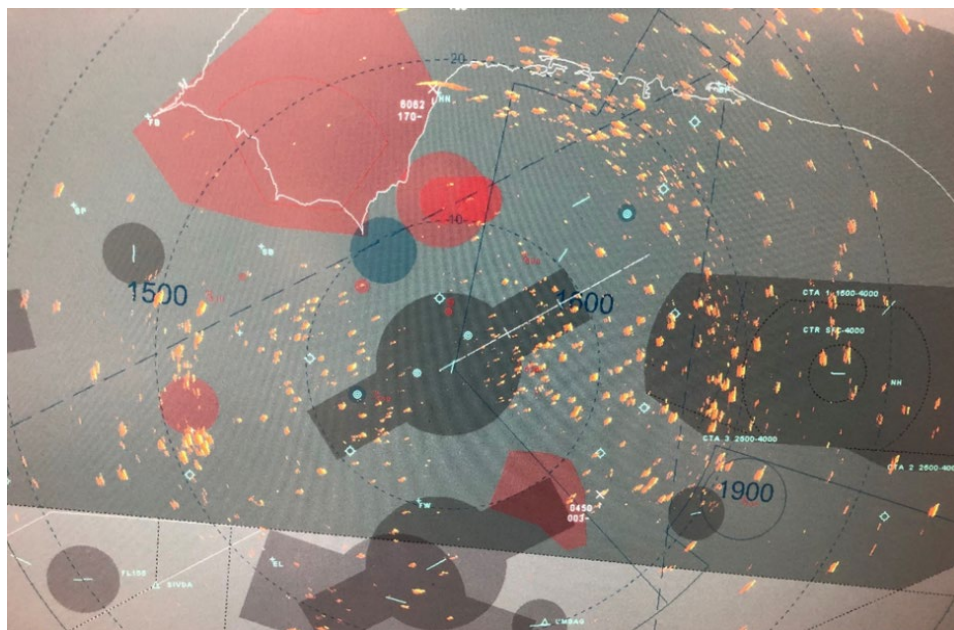
Recommendations: F-35B pilots be briefed on this Airprox and to be reminded that good and active look out scanning is required, as much as the continued need to follow good airmanship practice to be in receipt of an ATS, particularly when operating in congested Class G airspace with known and frequent helicopter activity between Norwich and the Anglian off-shore rigs. RAF Marham ATC review the need to adequately supervise Approach controllers during busy periods of activity to ensure that capacity issues do not prevent the detection and passing of relevant Traffic Information to formations.

The DDH commented that, overall, this DASOR highlights some of the risks associated with routine operations within VFR airspace. Whilst the F-35 is blessed with outstanding sensors that help develop very high levels of awareness, there will be occasions when a tactical system fails to provide complete SA of GAT (or military traffic) – this was one of those occasions. The report highlights specific areas that will help operators improve their awareness during departure and recovery; and I will mandate, through my ASC, that they are all implemented at the earliest point possible.

## Comments

**THE MARHAM SATCO** reports that the controller's honest appraisal highlights the challenges faced by controllers and the propensity for cognitive error when managing complex situations, with sometimes degraded equipment. The Watchman radar is sensitive to interference and clutter, particularly during the kind of weather experienced that week.





Unfiltered radar picture taken at 1830L on the day of the occurrence

Continuously having to manage the picture through filtration and decipher the results can certainly diminish attentional capacity and scan. Whilst the implementation of new radar equipment through Project MARSHALL will likely alleviate these issues through better processing and a short-term conflict alert (STCA) capability, the mitigation going forward must be supervision and support that matches the situation.

### HQ Air Command

This Airprox was subject to a Local Investigation, which made two recommendations: reminding crews about the importance of maintaining both visual and sensor lookouts and increasing the level of supervision for controllers during formation recoveries. The supervisor will also look to split out banded radar positions to reduce approach controller workload prior to anticipated recovery waves.

The F-35 has many sensors that can pick up potential airborne conflicts, particularly in contested airspace. It was these sensors that were able to pick up the AW139, albeit late; however, it did allow [F35 #2] to get visual, arrest their rate of descent and pass on the traffic to the trailing F35s. Even with these sensors and being in receipt of a Traffic Service, a critical barrier for any flight in Class G airspace is see and avoid. All F35 operators were mandated to read this Airprox as a case study to help improve awareness of the importance of lookout as much as the continued need to follow good airmanship practice; to be in receipt of an ATS, particularly with known and frequent helicopter activity between Norwich and the Anglian off-shore rigs. It is heartening that the level of supervision to controllers will be increased during busy periods, along with the splitting out of banded positions to help reduce workload, as this has been a theme with Airprox over the past year due to COVID working practices.

The crew of the AW139 are to be commended for their lookout and proactive actions to help reduce the risk of a collision; without this manoeuvre, the CPA would have been significantly closer. The pilot of [F35 #2] did well to pass on traffic information to the rest of the formation, thus reducing any further risk of conflict.

### Summary

An Airprox was reported when an AW139 and an F35 flew into proximity 14NM north-northwest of Norwich Airport at 1606Z on Wednesday 24<sup>th</sup> February 2021. Both pilots were operating in VMC, the AW139 pilot under IFR in receipt of a Traffic Service from Norwich and the F35 pilot under VFR in receipt of a Traffic Service from Marham.

## **PART B: SUMMARY OF THE BOARD'S DISCUSSIONS**

Information available consisted of reports from both pilots, radar photographs/video recordings, reports from the air traffic controllers involved and reports from the appropriate operating authorities. Relevant contributory factors mentioned during the Board's discussions are highlighted within the text in bold, with the numbers referring to the Contributory Factors table displayed in Part C.

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

Members first discussed the context of the Airprox and agreed that East Anglian airspace could routinely be busy with military fast jets and civilian traffic. The AW139 pilot was transiting to the north, was passed Traffic Information by the Norwich controller and picked up 3 of the 4 F35s visually, which the Board commended. The AW139 pilot could not predict the F35 pilots' intentions and so elected to maintain course and altitude initially, but then descended when the conflicting flight paths became apparent. The Board agreed that it would be inappropriate for the F35s to descend on to the AW139 if they had been aware of its position, but they were not initially and therefore normal rules in Class G prevailed. The F35 formation was in receipt of a Traffic Service from the Marham controller but the controller did not assimilate the converging AW139 (CF4), hence had no SA as to the developing conflict (CF6) and could not pass Traffic Information (CF3). Members noted that the Marham Tower controller had detected the converging AW139 on the Air Traffic Monitor, which was a replay of the Radar controller's display, and wondered why the Radar controller had not detected the confliction. After some discussion the Board agreed that a number of factors had been at play; in the Board's opinion, the Marham Radar controller's workload was high and an opportunity to provide additional support or reduce the Radar controller's workload had been missed (CF1); the Watchman radar picture was cluttered to such an extent that it was inadequate for the provision of a full Traffic Service (CF2) and the Radar controller had been occupied with arranging and passing climb-out details to the F35 formation in the time period immediately before CPA (CF5). In the event, the Norwich radar STCA was activated (CF7) and the Norwich controller was able to pass generic and specific Traffic Information to the AW139 pilot which, along with a TCAS TA (CF9), helped to direct their lookout scan and subsequent visual acquisition of the F35s. In contrast, the F35 formation had no SA on the converging AW139 (CF8) until F35 #2 achieved sensor detection and subsequent visual acquisition approximately 6sec before CPA (CF10). The Board commended the F35 #2 pilot for their quick action in passing traffic information to the following F35 #3, thereby achieving an increased vertical separation. A civilian controller member commented that it was disappointing that the F35s were not also TCAS equipped. A military pilot member responded that the highly dynamic flight profiles of military fast jets created a multitude of problems with respect to TCAS operation. TCAS maximum closing speeds and rates of climb and descent could easily be exceeded and formation activity invariably created nuisance alarms, adversely affecting pilot sensitivity to the alarms themselves. The Board noted that the F35 sensor suite was highly effective but that the Marham Investigation had emphasised the need to avoid complacency and that a robust lookout remained essential in G airspace. Turning to risk, some members felt that normal procedures had applied; the AW139 pilot had descended to give way to traffic converging from the right and, without the knowledge that the F35 #2 had seen the helicopter and stopped descent, was no doubt concerned by its proximity. However, the majority of the Board agreed that the AW139's descent had generated some of the vertical miss distance and therefore that although there was no risk of collision, the circumstances could not be viewed as normal operations; Risk Category C.

## **PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK**

### Contributory Factors:

2021008				
CF	Factor	Description	ECCAIRS Amplification	UKAB Amplification
<b>Ground Elements</b>				
<b>• Manning and Equipment</b>				
1	Human Factors	• ATM Leadership and Supervision	An event related to the leadership and supervision of ATM activities.	



2	Technical	• Radar Coverage	Radar Coverage	Non-functional or unavailable
x	• Situational Awareness and Action			
3	Human Factors	• ANS Traffic Information Provision	Provision of ANS traffic information	TI not provided, inaccurate, inadequate, or late
4	Human Factors	• Conflict Detection - Not Detected	An event involving Air Navigation Services conflict not being detected.	
5	Human Factors	• Task Monitoring	Events involving an individual or a crew/ team not appropriately monitoring their performance of a task	Controller engaged in other tasks
6	Contextual	• Traffic Management Information Action	An event involving traffic management information actions	The ground element had only generic, late or no Situational Awareness
x	• Electronic Warning System Operation and Compliance			
7	Technical	• STCA Warning	An event involving the triggering of a Short Term Conflict Alert (STCA) Warning	
<b>Flight Elements</b>				
x	• Situational Awareness of the Conflicting Aircraft and Action			
8	Contextual	• Situational Awareness and Sensory Events	Events involving a flight crew's awareness and perception of situations	Pilot had no, late or only generic, Situational Awareness
x	• Electronic Warning System Operation and Compliance			
9	Contextual	• ACAS/TCAS TA	An event involving a genuine airborne collision avoidance system/traffic alert and collision avoidance system traffic advisory warning triggered	
x	• See and Avoid			
10	Human Factors	• Identification/Recognition	Events involving flight crew not fully identifying or recognising the reality of a situation	Late sighting by one or both pilots

Degree of Risk: C.

Recommendation: Nil.

#### Safety Barrier Assessment<sup>5</sup>

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

#### **Ground Elements:**

**Manning and Equipment** were assessed as **partially effective** because Marham controller was bandboxed and the Marham radar was subject to high levels of clutter.

**Situational Awareness of the Conflication and Action** were assessed as **partially effective** because the Marham controller did not detect the confliction.

<sup>5</sup> The UK Airprox Board scheme for assessing the Availability, Functionality and Effectiveness of safety barriers can be found on the [UKAB Website](#).

<b>Airprox Barrier Assessment: 2021008</b>		Outside Controlled Airspace							
<b>Barrier</b>		<b>Provision</b>	<b>Application</b>	<b>Effectiveness</b>					
				<b>Barrier Weighting</b>					
				0%	5%	10%	15%	20%	
Ground Element	Regulations, Processes, Procedures and Compliance	✓	✓						
	Manning & Equipment	⚠	⚠						
	Situational Awareness of the Confliction & Action	✓	⚠						
	Electronic Warning System Operation and Compliance	✓	✓						
Flight Element	Regulations, Processes, Procedures and Compliance	✓	✓						
	Tactical Planning and Execution	✓	✓						
	Situational Awareness of the Conflicting Aircraft & Action	✓	✓						
	Electronic Warning System Operation and Compliance	⚠	✓						
	See & Avoid	✓	✓						
<b>Key:</b>		<u>Full</u>	<u>Partial</u>	<u>None</u>	<u>Not Present/Not Assessable</u>	<u>Not Used</u>			
Provision	✓	⚠	✗	●	○				
Application	✓	⚠	✗	●	○				
Effectiveness	■	■	■	■	■				