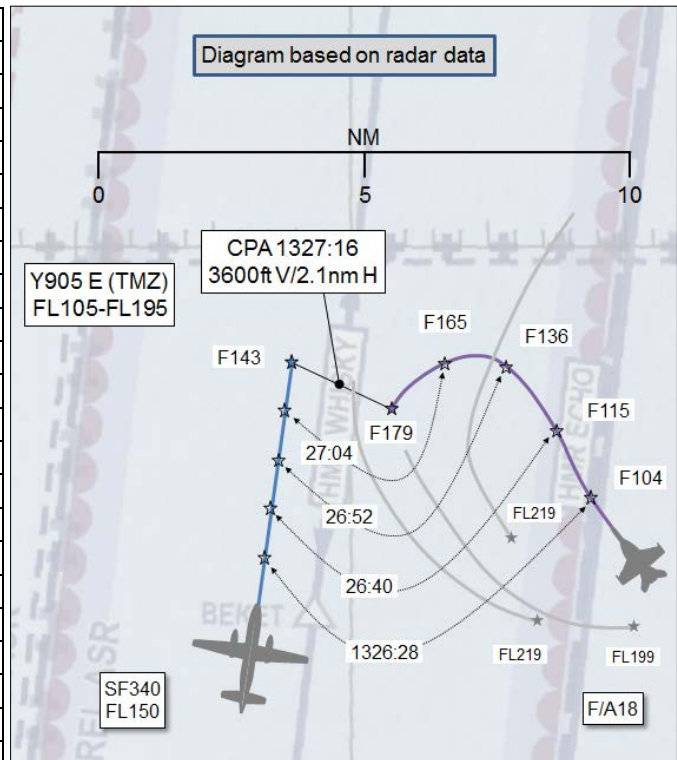


AIRPROX REPORT No 2017192

Date: 08 Aug 2017 Time: 1327Z Position: 5857N 00130W Location: 55nm S Sumburgh VOR

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	SF340	F/A-18
Operator	CAT	Foreign Mil
Airspace	Airway Y905 ¹	Airway Y905
Class	E (TMZ)	E (TMZ)
Rules	IFR	NK
Service	Radar Control	NK
Provider	Scottish	NK
Altitude/FL	FL143	FL179
Transponder	A,C,S	A,C
Reported		Not reported
Colours	Company	
Lighting	HISLs, nav	
Conditions	VMC	
Visibility	75nm	
Altitude/FL	FL150	
Heading	005°	
Speed	270kt	
ACAS/TAS	TCAS II	
Alert	RA	
Separation		
Reported	Not seen	NK
Recorded	3600ft V/2.1nm H	



THE SAAB SF340 PILOT reports receiving ‘pop-up’ traffic on TCAS ahead by approximately 4nm indicating 100ft above or below. It may not have been the aircraft which caused the TCAS RA but he subsequently received a TCAS RA "Descend, Descend". The crew were conducting the approach briefing at the time of the TCAS RA. The autopilot was disconnected and a manoeuvre flown as per company SOPs. At 14,500ft there was an instruction to "Level-off" followed by "Clear of conflict". The aircraft was flown to recover to the cleared Flight Level. They were alerted to potential military traffic by ATC and an associated NOTAM (Saxon Warrior exercise) but the military aircraft were not sighted at any time. There were multiple TCAS contacts ahead at >10nm all at least 5000ft below. Scottish control began to tell them about conflicting traffic immediately after they had begun the TCAS RA. The controller suggested that there was no threat from this traffic previously which had "popped up" on the radar.

He assessed the risk of collision as ‘High’.

THE F/A-18 PILOT was part of a foreign military carrier air group operating within the Saxon Warrior exercise but, because of the delay between notification and investigation, the particular pilot could not be traced.

Factual Background

The weather at Kirkwall was recorded as follows:

EGPA 081320Z 03005KT 9999 FEW026 16/09 Q1017

¹ Base FL105, upper level FL195.

Analysis and Investigation

CAA ATSI

The SF340 was on an IFR flight to Sumburgh, in receipt of a Radar Control Service from the Moray Sector controller. The aircraft was routing via Airway Y905 which is Class E controlled airspace and was maintaining FL150. At 1322:15, the controller advised the SF340 pilot about military activity, between 20-25nm ahead of them, around and to the east of the airway, advising that the maximum level they could see was an aircraft at FL107 (Figure 1), and that they would report on anything which became relevant traffic.

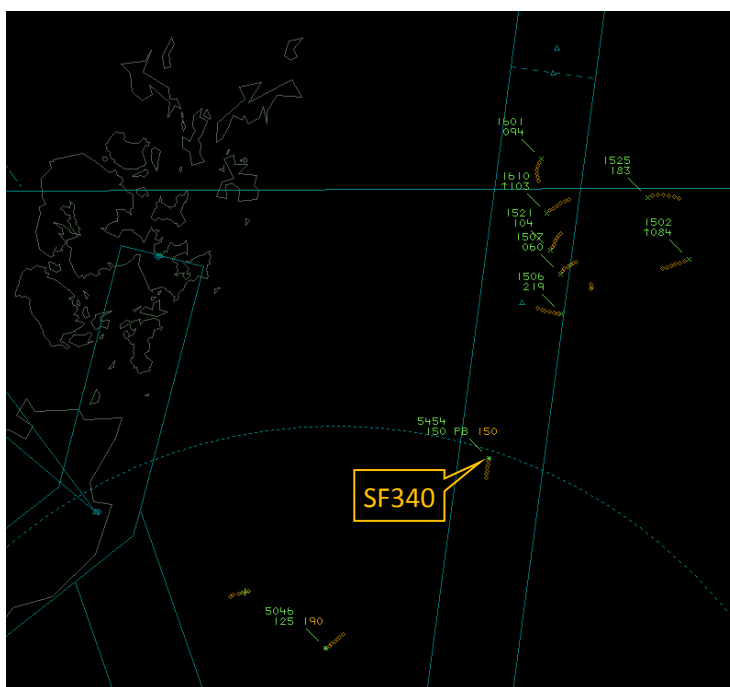


Figure 1 – 1322:15.

The second (unidentified) aircraft, which was transponding a NATO code 1521, had been observed maintaining FL105 for a number of minutes (Figure 2).

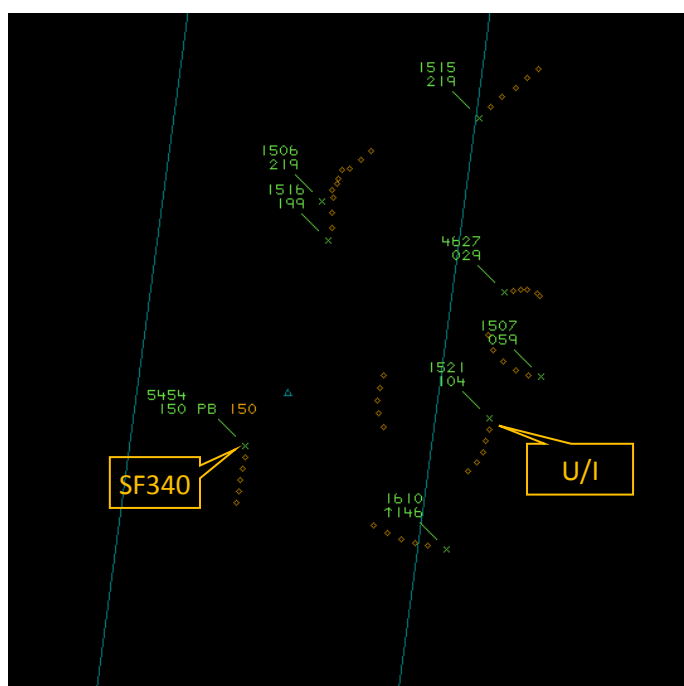


Figure 2 – 1325:51.

At 1326:22 the military aircraft was observed to commence a climb (Figure 3).

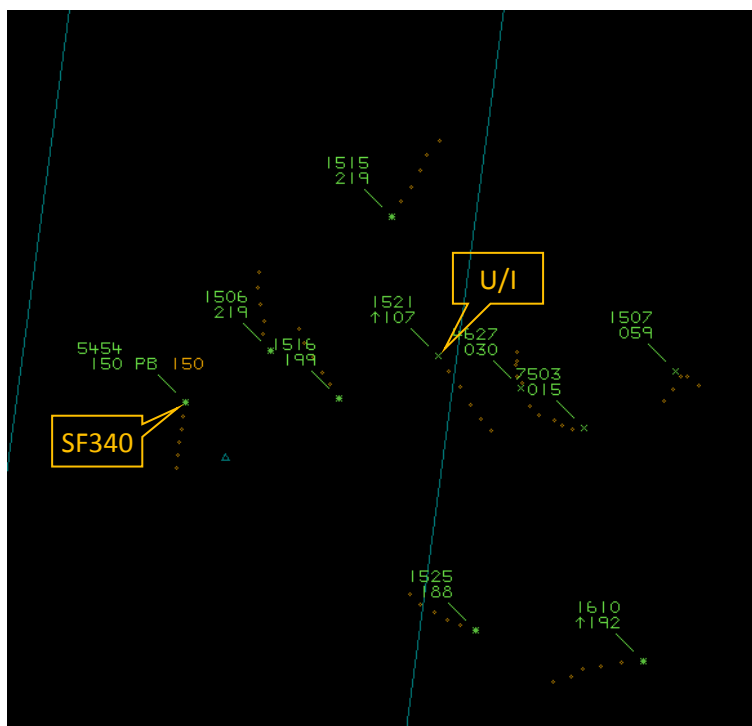


Figure 3 – 1326:22.

At 1326:52 the military aircraft was observed passing FL136, commencing a left-turn (Figure 4).

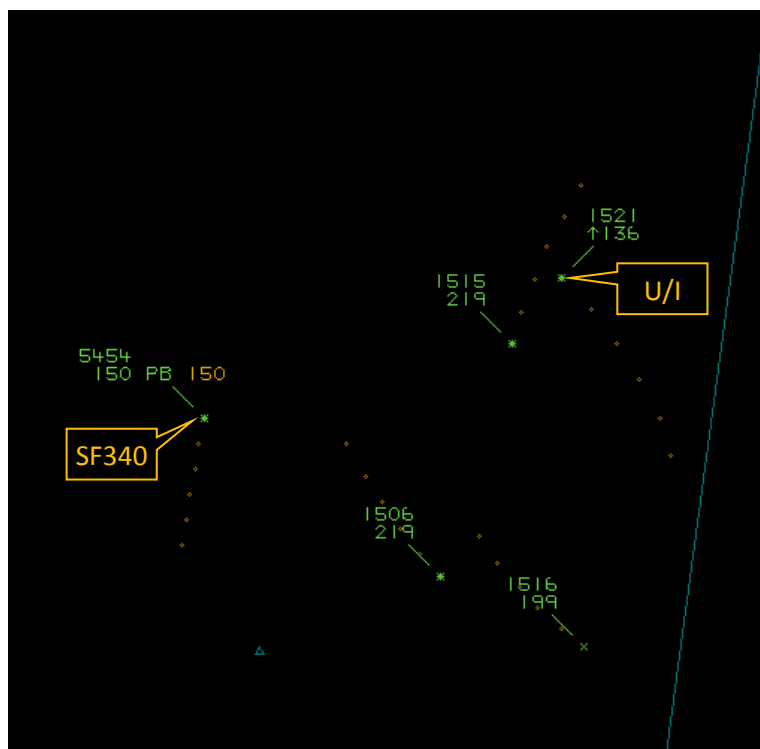


Figure 4 – 1326:52.

At 1327:00 the controller passed specific Traffic Information on the military aircraft, advising that it was in the SF340's 3 o'clock at 3nm, reporting the level as FL160. The controller also reported that the aircraft appeared to be turning south again (Figure 5).

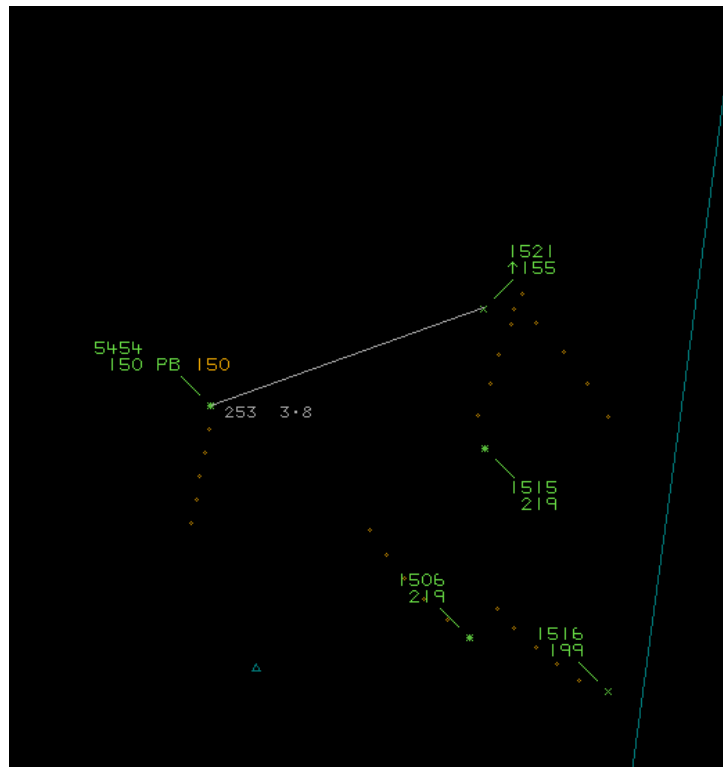


Figure 5 – 1327:00.

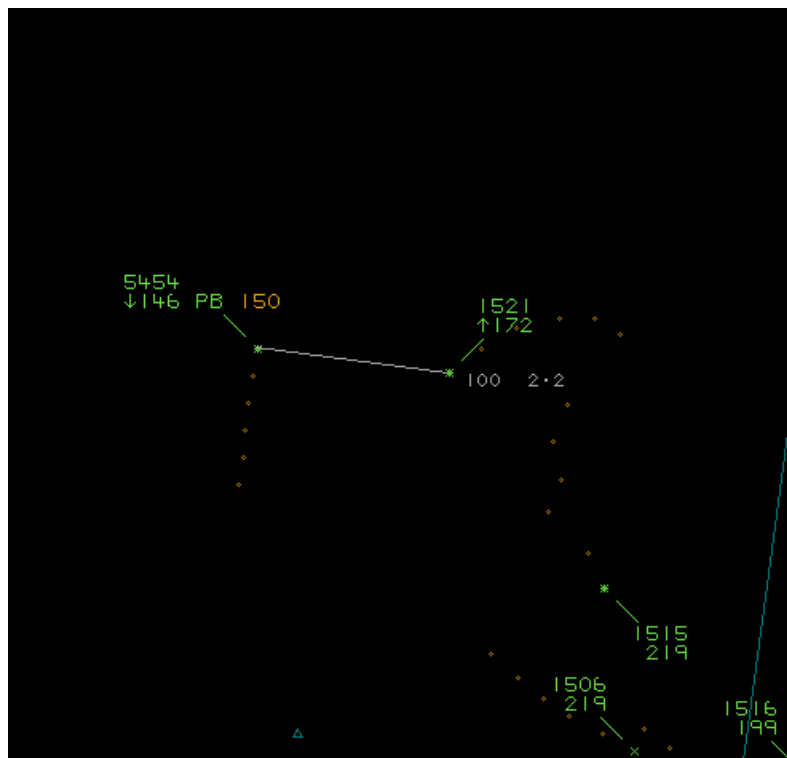


Figure 6 – 1327:12.

The SF340 pilot acknowledged this, and, at 1327:15, reported that they had received a TCAS RA and that they were just returning to FL150. CPA was at 1327:17 with the aircraft separated by 2.1nm laterally and 3600ft vertically (Figure 7).

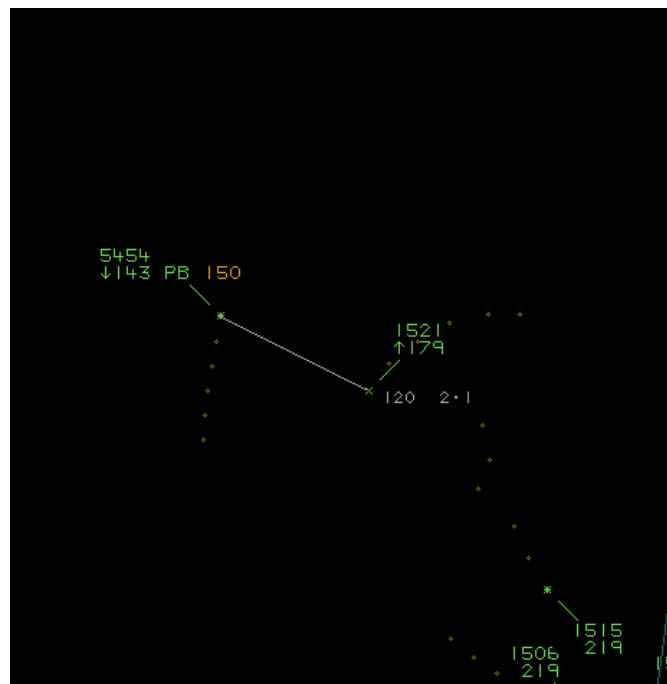


Figure 7 – 1327:17.

The SF340 pilot, in their written report, stated that at no time did they see the other aircraft, and that they had already responded to a TCAS RA prior to receiving Traffic Information from the controller. The controller reported on the R/T that the military aircraft had effectively just appeared shortly before they passed the Traffic Information, which the SF340 pilot also commented on, reporting that it had just appeared 100ft below them on TCAS.

The military aircraft, which had been maintaining level flight at FL105 for a sustained period of time, had commenced a rapid climb, the rate of which could not be accurately reported by the surveillance system, which would only report rates of up to 10,000fpm. ATSI ran different combinations of radar heads on the replay, and only by using Multi Radar Tracking (MRT), could a continuous altitude report be obtained from the military aircraft. This would have been provided as a result of the predictive element of MRT. Other single-source or dual-radar source displays reported no altitudes for the military aircraft for the majority of its climb. It is likely that the rate of climb exceeded both the processing capacity of the surveillance system and TCAS, both of which possibly did not report the altitude of the military aircraft for the majority of its climb. Further, the climb was commenced when the aircraft was surrounded by similar aircraft, and so possibly went unnoticed by the controller.

ATSI were not able to determine the air traffic service being provided to the military aircraft, and, due to the type of manoeuvring observed, an assumption was made that the aircraft were VFR.

Class E airspace provides a known traffic environment for IFR aircraft, all of which must file a flight plan and be in receipt of an Air Traffic Service. This is enhanced by the additional requirements of the airspace being a Transponder Mandatory Zone (TMZ). VFR aircraft may operate in Class E without an ATC service or flight plan but must comply with the requirements of the TMZ.

Controllers providing a Radar Control Service to IFR aircraft are not required to apply any defined deconfliction minima, but rather, must ensure that the radar return of their aircraft does not merge with that of any others whose intentions are not known. VFR aircraft are provided with ATC services in accordance with CAP774 UK Flight Information Services.

UKAB Secretariat

The SF340 pilot and the pilot of the unidentified aircraft shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard².

Occurrence Investigation

The UK AIP states that *'In order to ensure the credible interaction of Airborne Collision Avoidance Systems and ground based safety nets, other than aircraft in emergency and certain specific conditions for military aircraft (as detailed in Military AIP and MAA Regulatory Publication RA 3000 Series), all aircraft when operating under normal circumstances, when inside Controlled Airspace within the London and Scottish FIRs/UIRs should not operate with a climb or descent rate exceeding 8000fpm.'*³

The Military AIP states the specific conditions for not having to comply with the rate of climb restrictions. These include:

Aircraft in emergency.

Aircraft responding to Operation ADANA or an air defence priority flight where a high rate of climb is essential to the successful outcome of the mission.

Aircraft in receipt of avoiding action instructions to resolve an impending loss of standard separation or to avert a potential collision.

Aircraft under special arrangements made for research or test flying.

Aircraft participating in exercise activity notified/co-ordinated via an ACN.

Within Class E Controlled Airspace separation is provided between all IFR flights by ATC. ATC separation is not provided between IFR and VFR flights. Traffic information is provided to IFR flights on VFR flights as far as practicable.

Exercise SAXON WARRIOR 17 (SW17) took place between 1 and 10 August 2017, delivered by the Joint Tactical Exercise Planning Staff (JTEPS). SW17 was a programme of exercises conducted across the UK by warships, submarines and aircraft from 5 Nations. The maritime and air activity was focussed in the airspace, offshore and coastal waters of the whole coast of Scotland and to a lesser extent South West Approaches to the UK.

A number of NOTAM Nav warnings were issued concerning SW17 including:

+ Q) EGPX/QWELW/IV/BO/W/000/195/5845N00114W068
 EXER SAXON WARRIOR 17. LARGE FORMATIONS OF MIL HEL AND FIXED WING ACFT WILL BE LAUNCHING AND RECOVERING FROM AFLOAT MARITIME UNITS WI CARRIER VESSEL OPERATING AREA 04 (CVOA04) BOUNDED BY:-
 585100N 0023300W - 592000N 0012500W - 594000N 0000000E -
 591000N 0000000E - 582600N 0010000W - 582600N 0015400W -
 575000N 0015900W - 575000N 0022400W - 581650N 0024400W -
 585100N 0023300W (MORAY FIRTH).
 THIS IS AN AREA OF INTENSE AERIAL ACTIVITY AND ACFT MAY BE UNABLE TO COMPLY WITH RAC. FOR INFO SEE BRIEFING SHEET EXERCISE SAXON WARRIOR 17 ON UK AIS WEBSITE. OPS CTC - HMNB CLYDE - 01436 674321 EXTENSION 4409.
 LOWER: SFC
 UPPER: FL195
 FROM: 08 AUG 2017 07:00 TO: 08 AUG 2017 21:00

² SERA.3205 Proximity.

³ UK AIP ENR 1.1-14, Paragraph 3.2.2.3.

Comments

Joint Tactical Exercise Planning Staff (JTEPS)

JTEPS spent a vast amount of time briefing the US F/A-18 crews wherein it was specifically mentioned that fast-jets could not climb/descend at greater than 8000fpm in the UK FIR. JTEPS also highlighted that the water-space underneath Y905 is not an ideal place to launch and recover fast-jets. This information was received by the US aircrew and the response was that all activity would remain in Class G airspace unless under control of Swanwick Mil. Normally, the carriers provide a service to pilots within 30nm of the ship.

USAFE (on behalf of USN)

The M3 Squawk allocations on the exercise dictate that M3 1521 would have been a USN F/A-18. Consequently, it is almost certain that the unidentified aircraft was from the American aircraft carrier operating in SW17. It has not been possible to determine which aircraft was involved in the Airprox. It is possible that it was operating under 'Due Regard' procedures as follows:

When practical and compatible with the mission, U.S. military aircraft operating on the high seas shall observe ICAO flight procedures. However, the DoD policy recognizes that military aircraft cannot always comply with ICAO rules and lists four operational situations which may not lend themselves to complying with ICAO flight procedures:

EXEMPTIONS

Military Contingencies · Classified Missions · Politically Sensitive Missions · Routine Aircraft Carrier Operations or other training activities.

CONDITIONS REQUIRED TO FLY DUE REGARD;

Those operations not conducted following ICAO flight procedures are conducted under the "due regard" or "operational" prerogative of "state aircraft" and are subject to one or more of the following conditions:

Aircraft shall be operated in visual meteorological conditions (VMC); or Aircraft shall be operated within radar surveillance and radio communications of a surface radar facility; or aircraft shall be equipped with airborne radar that is sufficient to provide separation between themselves, aircraft they may be controlling, and other aircraft; or Aircraft shall be operated outside controlled airspace.

You can only fly "due regard" in international airspace, the airspace over the ocean farther than 12 nautical miles from the coast.

When you fly "due regard," you are guaranteeing the world that you can act as your own air traffic control and separate your aircraft from all others. In order to meet this stringent requirement, you must be in VMC, or within radar and radio contact of a surface facility providing radar separation, or your aircraft must have a radar capable of separating your aircraft and the aircraft you may be controlling from all other traffic, or you must be in uncontrolled airspace. Since most airspace over the oceans is controlled above 5,500 feet MSL, most "due regard" missions must be flown in VMC.

Summary

An Airprox was reported when an SF340 and an unidentified military fast-jet (believed to be an F/A-18) flew into proximity at 1327 on Tuesday 8th August 2017. The SF340 pilot was operating under IFR in VMC, in receipt of a Radar Control Service from the Scottish Moray Sector controller. The F/A-18 was participating in the Saxon Warrior 17 exercise.

PART B: SUMMARY OF THE BOARD'S DISCUSSIONS

Information available included reports from the SF340 pilot, area radar and RTF recordings and reports from the appropriate ATC and operating authorities.

The Board was disappointed that no report could be received from the F/A-18 pilot because this meant that they could not allow for his perception of what had occurred. Notwithstanding, members felt that there was sufficient information available from the other reports to come to a conclusion.

The Board first discussed the actions of the F/A-18 pilot. The Board noted that the pilot was operating from an American aircraft carrier participating in Exercise Saxon Warrior 17, and that a NOTAM had been published to detail that the airspace around the vicinity of the Airprox would be an area of Intense Aerial Activity in which aircraft may be unable to comply with the Rules of the Air. Members also noted that, prior to the Exercise, the Joint Tactical Exercise Planning Staff had briefed the Carrier operating crews about the status of the Class E airspace of Airway Y905, and that they had obtained an agreement that the crews would remain in Class G airspace unless they were under the control of Swanwick Mil. The Board was advised that, on the day, the Carrier had been positioned about 15nm west of its intended operating area, and that the planned location was under D809, which would have allowed the pilots segregated airspace with unrestricted climb potential after take-off. Some members wondered whether the crews had assimilated the fact that they were not in their intended location, and may therefore have thought that they were operating within D809 segregated airspace.

The Military Area Controller member advised the Board that he was aware that the F/A-18 crews had originally planned to operate with Hotspur (the Air Surveillance and Control System (ASACS) unit at RAF Boulmer) but, due to other tasks and insufficient manning, Hotspur were unable to provide them with a service. They then contacted Swanwick Mil to see if they could take them on a free-call; however, due to them already being fully tasked, Swanwick Mil were also not able to offer them an ATC Service. As a result, it was believed that the F/A-18 crews carried out their operation in contact only with their ship, who may not have had an intimate understanding of UK airspace. Given the scale of the Exercise, the Board was surprised that ASACS manning did not allow a service to be provided to the F/A-18 pilots, especially since this would have assisted them in achieving their intention of remaining clear of Y905. Although commending the F/A-18 pilots for persisting in trying to obtain an ATC Service, members noted that they had agreed not to enter Y905 without receiving an ATC Service from Swanwick Mil, and the Board considered that it was a contributory factor that the F/A-18 pilot entered Y905 despite agreement not to do so.

Notwithstanding, the Board noted that the F/A-18 pilots were entitled to operate in Class E airspace without receiving an ATC Service, provided that they were operating under VFR and were transponding. It was apparent that the F/A-18 pilot concerned had complied with the transponding requirement, although it seemed likely that he had exceeded the 8000fpm rule in controlled airspace thereby causing the SF340's TCAS and the NATS radar not to register the F/A-18's SSR height for significant periods. As a result, the SF340 TCAS would be unable to detect any conflict until SSR height change returned below 10,000fpm; this was likely to be the reason why the SF340 pilot only became aware of the F/A-18 as a 'pop-up' threat.

The Board then turned their attention to the cause and risk of the Airprox. Bearing in mind that both pilots were entitled to operate in Class E airspace, some members commented on the F/A-18 pilot's need to ensure less than 8000fpm height change and wondered whether this was the cause of the incident. They argued that, had he done so, then the Moray controller and SF340 TCAS would have been able to assist in ensuring separation was maintained. However, although the radar screen shots appeared to show that the F/A-18 pilot had greatly exceeded 8000fpm at times, the fact that the SF340 TCAS had generated an RA implied that the rate of climb was within TCAS parameters and so TCAS protection had been achieved. Others thought that the incident was best described as a TCAS sighting report given that the two aircraft had been separated by 3600ft vertically and 2.1nm horizontally at CPA. However, the fact that a TCAS RA had been generated caused many members to argue that this was more than a sighting report. In the end, and recognising that separation at

CPA was not particularly close, the Board agreed that the aircraft had potentially been on conflicting flight-paths and so they decided that the incident was best described as a conflict in Class E airspace. Turning to the risk, it was not known if the F/A-18 pilot had been aware of the presence of the SF340 on his radar and had purposely turned away from the aircraft, or if he had simply turned coincidentally as part of his manoeuvre. Nevertheless, at CPA, it was evident that the F/A-18 pilot was turning away from the SF340 and, with the two aircraft separated by 3600ft vertically and 2.1nm horizontally, it was apparent that there had therefore been no risk of a collision. That being agreed, the Board considered that normal safety standards and procedures within Class E airspace had not pertained, and so the incident was assessed as risk Category C.

Post Report Note: In response to this report, JTEPS confirmed that the USN crews had been fully briefed on the rules for entering Y905 and the implications of launching aircraft below the airway. They also confirmed that although the F/A-18 crews were only tasked to operate with ASACS for specific missions due to their limited controllers, the ideal situation would be to have ASACS controllers available for the whole flying window during Saxon Warrior 17. In this respect, Swanwick Mil were also briefed on the exercise, and received the daily Ex ATO and daily phone calls from exercise control with what to expect. JTEPS commented that it had been the UK Carrier Strike Team who had chosen the carrier operating location, and opined that this aspect needed better consideration for future exercises. Looking to the future, the JTEPS planning team acknowledged the following lessons: (1) early engagement with civil operators and the CAA on the locations of exercise areas outside of segregated airspace is key; (2) this incident will be used as an example in future airspace briefs to pick out all of the key aspects, in particular the implications of UK airspace (Class E), rapid rates of climb (not to exceed 8000fpm), considerations when tactical planning (crossing controlled airspace), and civil operations; and (3) that a robust feedback procedure will be developed for foreign exercise participants, especially those involved in safety incidents.

PART C: ASSESSMENT OF CAUSE AND RISK

<u>Cause:</u>	A conflict in Class E airspace.
<u>Contributory Factor:</u>	The F/A-18 pilot entered Y905 despite Exercise agreement not to do so.
<u>Degree of Risk:</u>	C.

Safety Barrier Assessment⁴

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

ANSP

ATC Strategic Management and Planning was assessed as **ineffective** because, despite being aware of the Saxon Warrior Exercise, the Military ATC manning was not sufficient to provide an ATC Service to the aircraft operating within it; this was especially pertinent because the crews had been advised to obtain an ATC Service from Swanwick Mil before entering Y905.

Flight Crew:

Regulations, Processes, Instructions, Procedures and Compliance were assessed as **ineffective** because the F/A-18 pilot did not comply with the agreement to remain outside CAS unless under control from Swanwick Mil, and he appeared at times to exceed the 8000fpm rate of climb restriction in controlled airspace.

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

Tactical Planning was assessed as **ineffective** because the F/A-18 pilot did not plan to route clear of Y905 during his manoeuvres.

Warning System Operation and Compliance was **partially available** because only one aircraft was equipped with an electronic warning system.

See and Avoid was assessed as **not used** because the pilots were at sufficient range not to resort to visual lookout.

