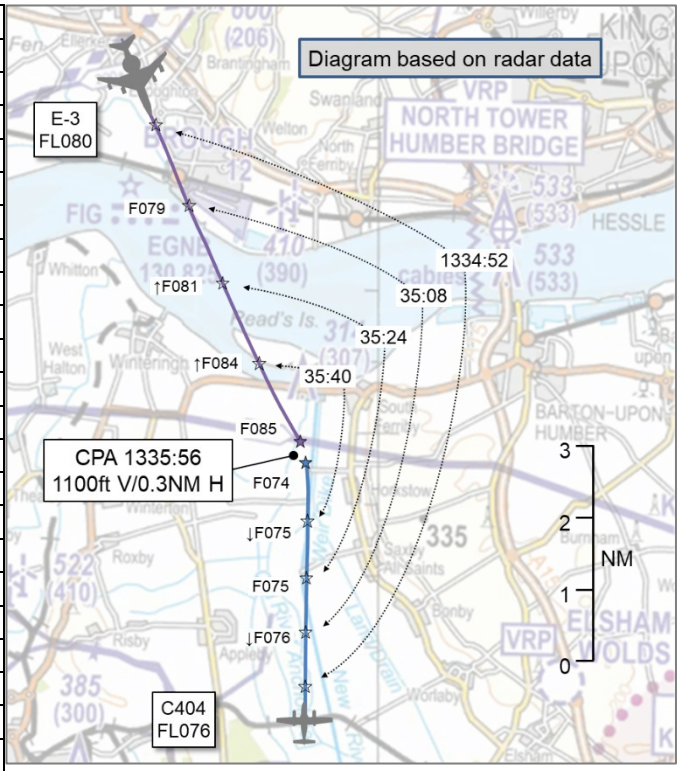
AIRPROX REPORT No 2021245

Date: 15 Dec 2021 Time: 1336Z Position: 5340N 00032W Location: 6NM NE Scunthorpe

PART A: SUMMARY OF INFORMATION REPORTED TO UKAB

Recorded	Aircraft 1	Aircraft 2
Aircraft	C404	E-3
Operator	Civ Comm	HQ Air (Ops)
Airspace	London FIR	London FIR
Class	G	G
Rules	VFR	Unknown
Service	Traffic	Traffic
Provider	Humberside Radar	Waddington Radar
Altitude/FL	FL074	FL085
Transponder	A, C, S	A, C, S
Reported		
Colours	White, Blue	NR
Lighting	Anti-cols, Nav	NR
Conditions	VMC	VMC
Visibility	>10km	NR
Altitude/FL	8000ft	NR
Altimeter	QNH (NK hPa)	Std (1013hPa)
Heading	360°	NK
Speed	165kt	NK
ACAS/TAS	Not fitted	TCAS II
Alert	N/A	Unknown
Separation at CPA		
Reported	600-700ftV/1NM H	NK V/NK H
Recorded	1100ft V/0.3NM H	



THE C404 PILOT reports that whilst operating a survey flight in the Hull area they were on a south to north line at 8000ft in uncontrolled airspace and in receipt of a Traffic Service from Humberside Radar. The controller informed them of "*traffic 4NM at twelve o'clock at Flight Level 080 on a converging track, type Boeing E-3*". At this moment in time they were dividing their attention between the survey screen and looking out straight ahead and within what they believe to be less than 10sec they spotted the traffic and reported "Traffic in sight". They estimated the other aircraft to have been 600-700ft above them and at this point less than 2NM away. They expected [the other traffic] to most probably have them on TCAS and therefore manoeuvre to avoid but they didn't appear to react. Given their angle compared to the other crew's point of view they believe it unlikely that they would have been able to spot them visually. They therefore decided to descend by 500ft and turn right 30°, coming off the survey line. Once the aircraft was effectively overhead their position they observed it to be in a turn and possibly be climbing.

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

THE E-3 PILOT reports that on 13 Jan 22 they were advised that an Airprox had been filed relating to an [E-3] sortie flown on 15 Dec 21[1]. Available information states that the incident occurred at 1335 in the vicinity of Barton-on-Humber. At this point in the sortie they were on recovery to [destination airfield] and would have been in receipt of either a Traffic Service or Deconfliction Service (depending on whether they were in IMC or VMC at the time) from either Swanwick Military or Waddington (depending on whether it was before or after the ATC handover, which would typically take place somewhere around the Humber). It is likely that they may have received traffic calls from ATC relating to the aircraft [whose pilot] has filed the Airprox; however, they cannot recall if they gained visual contact with the specific aircraft in question. They did not receive any TCAS Resolution Advisories during the sortie and they don't recall any TCAS Traffic Alerts. The TCAS was on and serviceable at the time. They have

[1] E-3 operating organisation was advised of the Airprox on 22nd December 2021.

consulted the other flight deck crew on the sortie (there were 5 persons on the flight deck at the time) and nobody can recall anything of significance. No Cockpit Voice Recorder information is available, as data from this time would have been overwritten by the time they landed. The incident is assessed as low severity from their perspective, as the barriers of ATC, TCAS and visual lookout by both aircraft crews, would appear to remain as mitigation against an accident.

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

THE HUMBERSIDE RADAR CONTROLLER contributed to an internal investigation and their information has been used to compile the unit investigation below.

THE WADDINGTON RADAR CONTROLLER reports that, as this incident happened over a month ago, they are not 100% sure of the details, but they have been able to listen to the recordings. At the time Waddington had controllers operating at Cranwell as Waddington had pre-planned works on their PSR. There were several calls from Swanwick Military, Scampton and Cranwell, in and around this time with the Red Arrows movements. Due to this, and to ease the workload for the controller at Cranwell, they had elected to take the inbound E-3. They did not take the handover from Swanwick Mil, but the aircraft was handed over at FL80 and that Traffic Information had been called from the Swanwick Mil controller. After they had identified the aircraft, they informed the pilot of working SSR alone, called the Traffic Information again which was south 6NM indicating 400ft below and shortly after issued a climb to FL85 to build in further separation. [The E-3 pilot] was under a Traffic Service throughout and became visual with the traffic shortly after the climb was issued. The pilot from [the E-3] did not state that they had received any TCAS information.

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

THE WADDINGTION RADAR SUPERVISOR reports that they were in the ACR at the time of the incident, but do not recall the specific details. They vaguely remember taking a handover from Swanwick Military, with traffic south of them by 20NM which had been called. [The E-3 pilot] was under a Traffic Service throughout. They believe the air system came onto frequency approximately 20sec later. The Radar controller called the traffic and offered a climb, which the air system pilot took and also reported visual. The Radar controller's separation climb would have given 1000ft separation on Mode 'C'. At no point do they recall [the E-3 pilot] having a TCAS [alert] against the other air system.

Factual Background

The weather at Humberside was recorded as follows:

```
METAR EGNJ 151320Z 24012KT 9999 FEW020 12/08 Q1027
METAR EGNJ 151350Z 24011KT 9999 FEW020 12/08 Q1027=
```

Analysis and Investigation

Humberside unit investigation.

The secondary radar position was in operation to reduce the workload from the primary position due to the traffic levels. [C404 c/s] was carrying out survey work to the west of Humberside, carrying out survey lines between the Humber river and just north of the Scampton R313 area.

At **1333** [E-3 c/s] was passing Market Weighton at FL105 descending, the [C404] was operating on a north-bound survey line at FL076

At **1334** [E-3 c/s] was transiting from north to south and changed squawk to a Waddington Radar Approach recovery squawk and appeared to level off at FL080. The controller passed further Traffic Information to [the C404 pilot] on the E-3. The pilot reported visual with the E-3 when both aircraft were 4NM lateral distance and 700ft vertical distance indicated. The [E-3] then indicated a slow climb and passed over the [C404] with a vertical separation indicated of 900ft. The pilot of [C404 c/s] reported descending and levelled off at FL070.

At **1339:15** the pilot of [C404] requested what the separation distance was between themself and the E-3. The controller advised that they could not remember due to the pilot of the [C404] reporting

visual with the E-3. The pilot of [C404] said that they "may file an Airprox when they return to base, after they had checked the regs". This was acknowledged by the ATCO, who rang the controller at Waddington, who in turn would advise operations. The pilot of the [C404] subsequently called Humberside ATSU on landing back at base, to advise that they wouldn't be filing an Airprox. So, no internal action was taken. It was only on receipt of an email advising that an Airprox had been filed that internal investigations were started at Humberside. The Radar controller on duty was found to have complied with all relevant procedures, Traffic Information was passed that provided the pilot of [the C404] with good situational awareness to maintain the safety of flight whilst under a Traffic Service in accordance with CAP774.

THE WADDINGTON UNIT INVESTIGATION concluded that the civilian aircraft and E-3 were height separated by 400ft from each other on Mode C and laterally separated by 6NM. Separation was achieved by the Military controller.

CAA ATSI

ATSI were unable to complete a full investigation due to a lack of useable RTF, however the area radar replay was reviewed and the unit contacted for further information.

At **1334:00** the E-3 was 15NM north of the C404 passing FL88 having previously been observed to be making a good rate of descent, which then slowed as it approached and subsequently levelled-off at FL80.

When the Humberside Radar controller first passed Traffic Information at **1334:17** *"[C404 c/s] I do have traffic left of your 12 o'clock, range of 9 miles on a south-easterly track, descending passing 80, will keep you advised"*, the aircraft were actually 12.5NM apart although converging slightly.

The E-3 was observed to be maintaining FL80 at **1334:36** with the aircraft separated by over 10NM laterally.

At **1335:16**, when the Humberside controller updated the Traffic Information, the aircraft were 5.2NM apart, and the E-3 was then observed to be in a climb. When the aircraft were 0.3NM apart at **1335:54**, they were separated by over 1000ft vertically, with the C404 observed to then be in a descent. The E-3 passed 1200ft above the C404 at **1335:59** (CPA).

According to CAP 774 UK Flight Information Services when providing a Traffic Service in Class G airspace:

> *The controller shall pass traffic information on relevant traffic, and shall update the traffic information if it continues to constitute a definite hazard, or if requested by the pilot. However, high controller workload and RTF loading may reduce the ability of the controller to pass Traffic Information, and the timeliness of such information. Traffic is normally considered to be relevant when, in the judgement of the controller, the conflicting aircraft's observed flight profile indicates that it will pass within 3NM and, where level information is available, 3,000 ft of the aircraft in receipt of the Traffic Service or its level-band if manoeuvring within a level block.*
> *However, controllers may also use their judgment to decide on occasions when such traffic is not relevant, e.g., passing behind or within the parameters but diverging.*
> *Controllers shall aim to pass information on relevant traffic before the conflicting aircraft is within 5NM, in order to give the pilot sufficient time to meet their collision avoidance responsibilities and to allow for an update in Traffic Information if considered necessary. Controller judgement is essential to ensure that Traffic Information is relevant and timely.*
> *Controllers should take account of the aircraft's relative speeds, lateral and vertical closure rates, and track histories.*

The Humberside controller passed timely Traffic Information to the pilot of the C404 on the E-3. The pilot of the C404, which appeared to not have an observer on board, stated in their report that when passed Traffic Information the second time they were "dividing their attention between the survey

screen and looking out straight ahead". They did not reference the first Traffic Information passed when the aircraft were still some 12NM apart.

Military ATM

Due to a pre-planned outage of the PSR, Waddington was operating SSR Alone. Although there was a Waddington controller operating from Cranwell, the Waddington Approach controller, who was operating from Waddington, opted to take the E-3 for their inbound transit due to the traffic already under the control of the controller at Cranwell. Although they did not take the handover of the E-3, they were advised that the pilot had been passed Traffic Information by Swanwick Mil prior to the handover. Once the E-3 had been identified, Traffic Information was updated stating that the C404 was 6NM away indicating 400ft below. The controller issued a climb from FL80 to FL85 to increase separation with the E-3 pilot reporting visual shortly afterwards.

The Supervisor reported that they vaguely remember taking the handover of the E-3 and noted that the C404 was around 20NM away. They confirmed that Traffic Information and a climb was given to the E-3 pilot and did not recall the E-3 pilot reporting a TCAS TA or RA.

Figures 1 – 3 show the positions of the C404 and the E-3 at relevant times during the Airprox. The screenshots are taken from a replay using the NATS radars which are not utilised by the Waddington controllers, therefore, may not be entirely representative of the picture available.

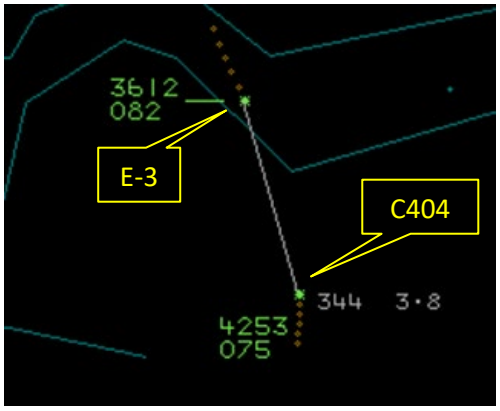


Figure 1 - C404 pilot believed to be visual with E-3.

On review of the Humberside controllers report, the C404 pilot reported visual with the E-3 at around 4NM lateral and 700ft vertical separation.

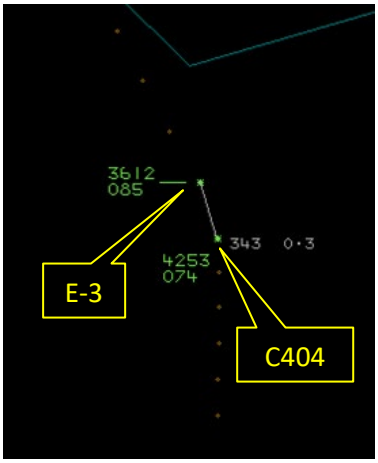


Figure 2 – Sweep prior to CPA.

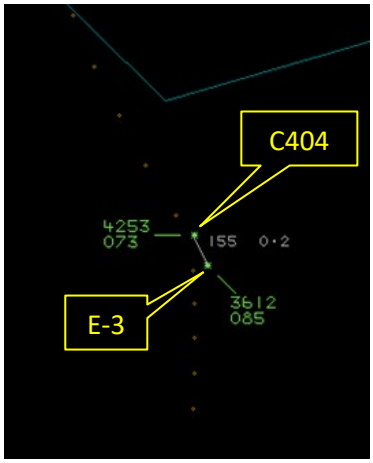


Figure 3 – Sweep after CPA.

Shortly after it was believed the C404 pilot reported visual with the E-3, the E-3 began to climb, levelling at FL85 which matches the pilot and controller reports. CPA occurred between radar sweeps with separation prior to the sweep measuring at 0.3NM and 1100ft.

Due to the delay in reporting the Airprox Waddington ATC were unable to impound the RT recording therefore a tape transcript could not be provided. All reports indicate that Traffic Information was passed although the accuracy cannot be confirmed. The Waddington Approach controller, identifying that the initial separation may not be satisfactory, climbed the E-3 by 500ft. Although potentially not required, as the E-3 was operating under a Traffic Service, the increased separation could have provided enough separation to avoid a TCAS RA/TA. The C404 pilot appeared to assume that the E-3 would avoid them due to the expectation of TCAS operation. The delay in Airprox notification has resulted in a loss of information.

UKAB Secretariat

The Airprox was reported to UKAB by the C404 pilot on 18th December, disseminated to Humberside on 21st December and the E-3 operating organisation on 22nd December. The C404 and E-3 pilots shared an equal responsibility for collision avoidance and not to operate in such proximity to other aircraft as to create a collision hazard.[2] For aircraft at or about the same level: if the incident geometry is considered as head-on or nearly so then both pilots were required to turn to the right[3]; if the incident geometry is considered as converging then the E-3 pilot was required to give way to the C404.[4]

Comments

HQ Air Command

The timeline with which this Airprox was fully processed was unfortunate as this denied the E-3 unit notice and time for any data and information to be secured. Due to the period between the event and notification, memory recall and data was limited for the E-3 investigator. ATC tapes were listened to although the information was not preserved prior to automatic deletion. That said, it appeared that the E-3 pilot was under a Traffic Service, was given Traffic Information on the C404 and was issued a climb to increase vertical separation. From revisiting the tapes, the E-3 pilot reported visual shortly after the climb was issued. The E-3 is fitted with TCAS and the assumption is that this would have alerted accordingly had the C404 been within the alerting zone. Owing to the distances involved at the point of the Airprox, there was no risk of collision. It does highlight, however, the importance of reporting an Airprox over the radio, or by calling the ATSU immediately after landing, to allow for an effective investigation.

Summary

An Airprox was reported when a C404 and an E-3 flew into proximity 6NM northeast of Scunthorpe at 1336Z on Wednesday 15th December 2021. The C404 pilot was operating under VFR in VMC, it could not be determined under what rules the E-3 had been operating, both pilots in receipt of a Traffic Service, the C404 pilot from Humberside Radar and the E-3 pilot from Waddington Radar.

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.

The Board discussed this event and were satisfied that there had been no risk of collision. Members commented that any expectation that the pilot of an aircraft would receive a TCAS or other EC equipment alert, and manoeuvre to avoid a collision should be avoided, and pilots must always anticipate having to give way when required to do so. Members' focus then turned to whether or not

[2] (UK) SERA.3205 Proximity. MAA RA 2307 paragraphs 1 and 2.
[3] (UK) SERA.3210 Right-of-way (c)(1) Approaching head-on. MAA RA 2307 paragraph 13.
[4] (UK) SERA.3210 Right-of-way (c)(2) Converging. MAA RA 2307 paragraph 12.

there had been a degradation in safety and it was agreed that normal safety standards and parameters had pertained and, as such, the Board assigned Risk Category E.

Members agreed on the following contributory factor:

CF1. Although normal safety parameters were assessed by the Board to have pertained, the separation between the aircraft at CPA was such that it had caused concern to the pilot of the C404.

PART C: ASSESSMENT OF CONTRIBUTORY FACTORS AND RISK

Contributory Factors:

	2021245			
CF	**Factor**	**Description**	**ECCAIRS Amplification**	**UKAB Amplification**
	Flight Elements			
	• See and Avoid			
1	Human Factors	• Perception of Visual Information	Events involving flight crew incorrectly perceiving a situation visually and then taking the wrong course of action or path of movement	Pilot was concerned by the proximity of the other aircraft

Degree of Risk: E

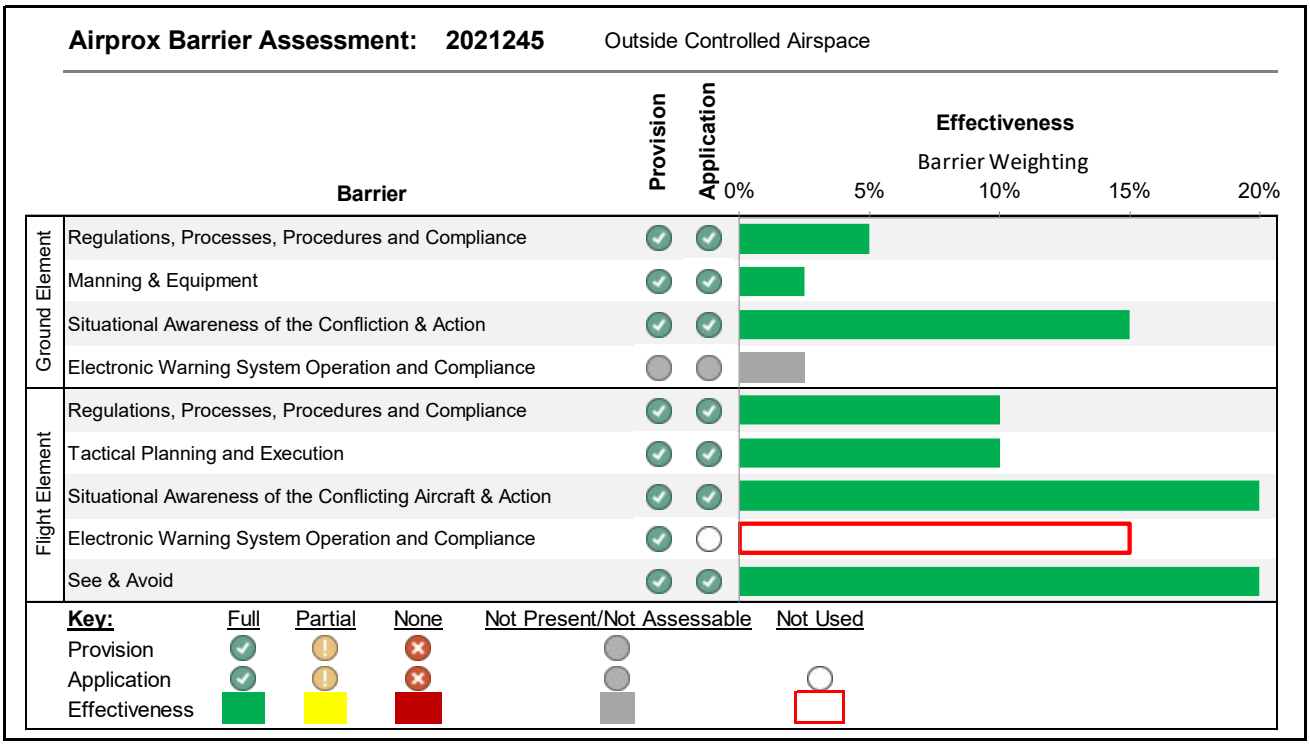
Safety Barrier Assessment[5]

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

Flight Elements:

Electronic Warning System Operation and Compliance were assessed as **not used** because the separation and trajectories of the aircraft had been such that they had not entered the envelope within which an alert is issued.

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


Airprox Barrier Assessment: 2021245
Outside Controlled Airspace
Barrier
Provision
Application
Effectiveness
Barrier Weighting
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
Key:
Full
Partial
None
Not Present/Not Assessable
Not Used
Provision
Application
Effectiveness