

## **AIRPROX REPORT No 2013115**

**Date/Time:** 31 Jul 2013 2021Z (Twilight)

**Position:** 52 50N 000 45E  
(0.9nm SW of Sculthorpe)

**Airspace:** London FIR (Class: G)

**Reporting Ac** **Reported Ac**

**Type:** MC130H Tornado

**Operator:** Foreign Mil HQ Air (Ops)

**Alt/FL:** 700ft 1600ft  
Rad Alt QFE (1010hPa)

**Weather:** VMC VMC

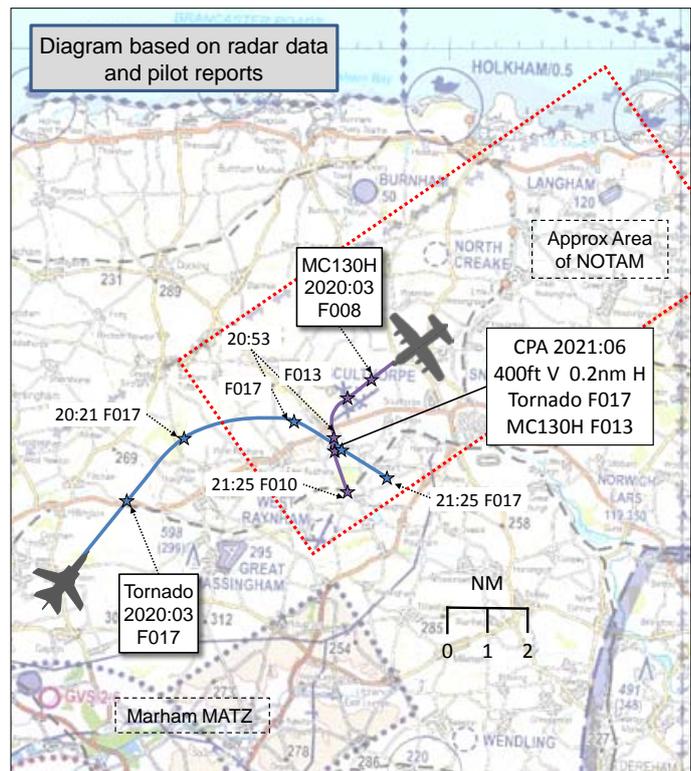
**Visibility:** NR NR

**Reported Separation:**

NR V/0ft H 1000ft V/2nm H

**Recorded Separation:**

400ft V/0.2nm H



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

**THE MC130H PILOT** reports flying at 200kt, at 500ft agl, VFR in VMC, conducting airdrop operations, which had been NOTAM'd, at Sculthorpe DZ<sup>1</sup>. The crew were flying a grey aircraft with strobe lights, navigation lights and anti-collision lights turned on, squawking transponder Modes 3/A, C & S and in radio contact with the DZ ground control staff. After their second drop, whilst climbing from 600ft agl to 1000ft agl, they received a TCAS<sup>2</sup> RA<sup>3</sup> on a converging, fast-moving aircraft at 'co-altitude'. The other aircraft was seen and identified as a Tornado by the DZ ground control staff. The MC130H crew 'dove down to 500ft agl' until the RA cleared and did not see the Tornado change course or climb; they report that the Tornado overflew both their aircraft and the DZ at around 700ft agl. Straight after the encounter, the MC130H crew contacted Anglia radar, reported the RA and asked them to pass information on their activity to Marham for onward transmission to the Tornado crew.

He assessed the risk of collision as 'High'.

**THE TORNADO PILOT** reports heading 060°, at 250kt, VFR in VMC, conducting a heavyweight single-engine instrument pattern, as part of an 'undemanding night currency sortie'. They described VMC with 10km visibility, SCT cloud at 5000ft and 'adequate' working light levels. The crew were flying a grey aircraft, with strobe and navigation lights turned on, squawking transponder Modes 3/A, C and S, and in receipt of a 'radar service' from Marham Approach. Marham Approach instructed the pilot to descend to 1600ft QFE and he reports being 'vectored around' traffic that, he recalls, being reported east of him by 12nm and 1000ft below him. The crew saw the MC130H 2nm away and 1000ft below them and report being happy with 'radar and visual' deconfliction throughout the occurrence. In their report the crew expressed surprise that the MC130H crew were not in radio contact with Marham ATC considering how close they were to the Marham radar pattern.

He assessed the risk of collision as 'Low'.

<sup>1</sup> Drop-zone

<sup>2</sup> Traffic Alert and Collision Avoidance System

<sup>3</sup> Resolution Advisory

**THE APPROACH CONTROLLER** reports a medium-to-low workload and minimum task complexity whilst providing a Traffic Service to the Tornado crew at 1600ft (QFE 1010hPa) and no other aircraft on frequency. Approach had instructed the Tornado crew to fly downwind in the radar pattern, on a heading of 040°, and to carry out cockpit checks, when he saw the MC130H's track between 'Little Snoring and Fakenham' (4nm East of Sculthorpe), squawking mode 3/A 7000. The controller reports passing Traffic Information to the Tornado crew, '12 o'clock, 10 miles, tracking South-west, indicating 1000ft below'. The Tornado crew were instructed to turn right on to a heading of 120°, ahead of the MC130H's track. When the controller saw the MC130H's Mode C indicate that the aircraft was climbing, he updated the Traffic Information, 'East, 2nm, indicating 300ft below'; the Tornado crew reported 'visual with the aircraft passing behind'. Anglia radar subsequently called to inform Marham ATC that the M130H had reported a TCAS RA.

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

## Factual Background

Figure 1 below is the text from NOTAM Y2556/13:

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MANDATORY TEMPORARY AVOIDANCE. AIR DROPS.
AIR DROPS AT SCULTHORPE DZ.
CREWS ARE TO AVOID AN AREA BOUNDED BY THE FOLLOWING POSITIONS:
N52 54.50 E001 03.00
N52 46.50 E000 44.50
N52 51.50 E000 39.30
N52 59.50 E000 57.00
ALL AIRCREW MUST BE AWARE THAT ALTHOUGH THE AIR DROPS WILL TAKE PLACE
AT SCULTHORPE, PARTICIPATING ACFT WILL MANOEUVRE WITHIN THE AREA
STATED AND MAYBE UNABLE TO COMPLY WITH THE NORMAL RULES OF THE AIR.
AVOIDANCE STATUS EXCLUDES THOSE PARTS WHICH FALL WITHIN CONTROLLED
AIRSPACE.
THIS NOTAM IS A MANDATORY TEMPORARY AVOIDANCE, HOWEVER, CREWS IN
RECEIPT OF A RADAR SERVICE FROM A RADAR EQUIPPED UNIT, MAY BE GIVEN
RADAR VECTORS THROUGH THE MTA IF IT IS KNOWN THAT THERE ARE NO AIR
DROPS TAKING PLACE.
F) GL
G) 2000FT AGL, ACTIVITY EXTENDS ABOVE)
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Figure 1

The Weather at Marham at 1950 was:

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METAR EGYM 311950Z 21010KT 9999 FEW020 SCT050 20/17 Q1013 BLU TEMPO BKN020 WHT
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Sunset at Marham was at 1953

## Analysis and Investigation

### CAA ATSI

The MC130H crew were not in two-way contact with Anglia Radar at the time of the Airprox and only contacted that unit after the occurrence to report it. Consequently there is no ATSI report.

### Military ATM

All heights/altitudes quoted are based upon SSR Mode C from the radar replay unless otherwise stated.

The incident sequence commenced at 2018:03 as the Tornado steadied on a heading of 040° downwind in the Radar Training Circuit. Figure 2 depicts the incident geometry at this point; SSR 3A 3643 was the Tornado, SSR 3A 7000 was the MC130H.

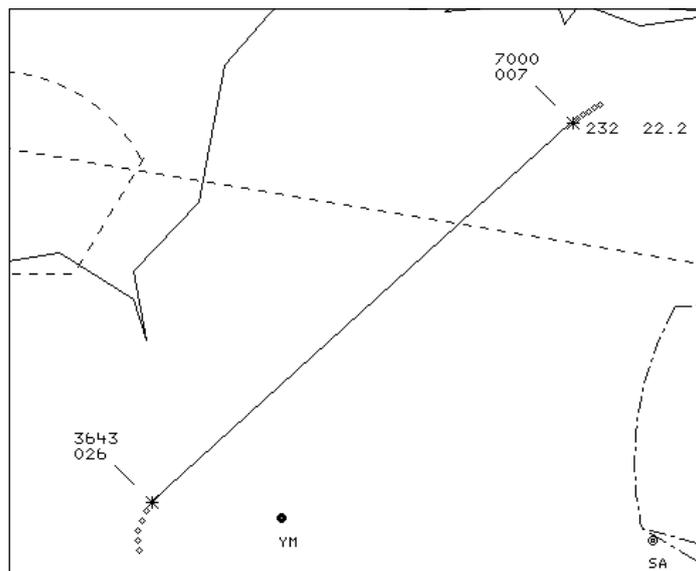


Figure 2: Incident Geometry at 2018:03

Regarding aircraft engaging in parachute dropping activity, UK AIP ENR 1.6 2.2.2.2.1 states:

‘Unless a discrete Mode A code has already been assigned, pilots of transponder equipped aircraft should select Mode A code 0033, together with Mode C pressure altitude reporting mode of the transponder, five minutes before the drop commences until the parachutists are estimated to be on the ground.

May be selected at pilot's discretion’.

It further states that military fixed-wing aircraft operating within the UK Low Flying System, beneath 2000ft MSD, should transpond SSR 3A 7001.

At 2019:44, Marham Approach passed the Tornado Traffic Information on the MC130H, stating *“traffic right, 2 o'clock, 9 miles, uh reciprocal, indicating 1000 feet below. Your uh next turn will uh put you ahead of him out of his way”* which was acknowledged. Figure 3 depicts the incident geometry at this point.

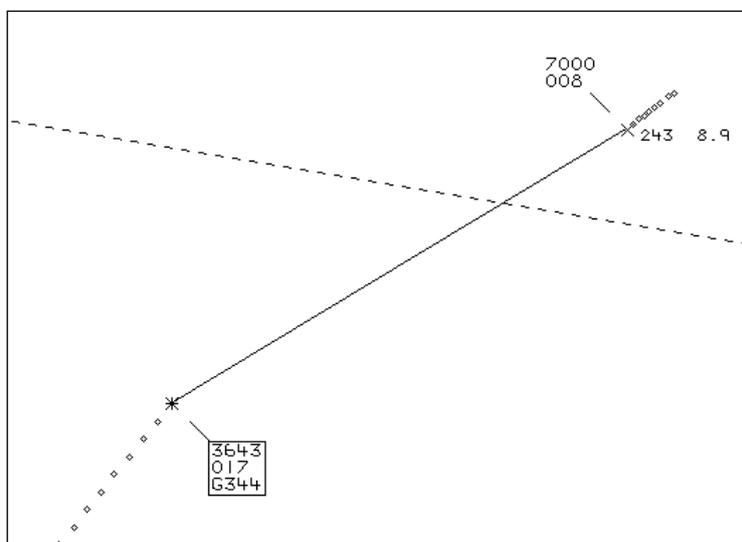


Figure 3: Incident Geometry at 2019:44

At 2020:03, Marham Approach instructed the Tornado to “turn right 130 degrees” which was acknowledged. At this point, the MC130H was 6.5nm North-east of the Tornado, tracking south-westerly, indicating 800ft; the Tornado was heading 040°, indicating 1700ft. 19sec later, at 2020:22, the Tornado initiated the right turn onto 130°. Co-incident with the Tornado initiating the right turn, the MC130H indicated a slow climb. At 2020:31, Marham Approach updated the Traffic Information on the MC130H for the Tornado crew, advising them “*previously called traffic, east 2 miles, tracking uh south-west, slow moving, indicating 500 feet below.*” Figure 4 depicts the incident geometry at this point.

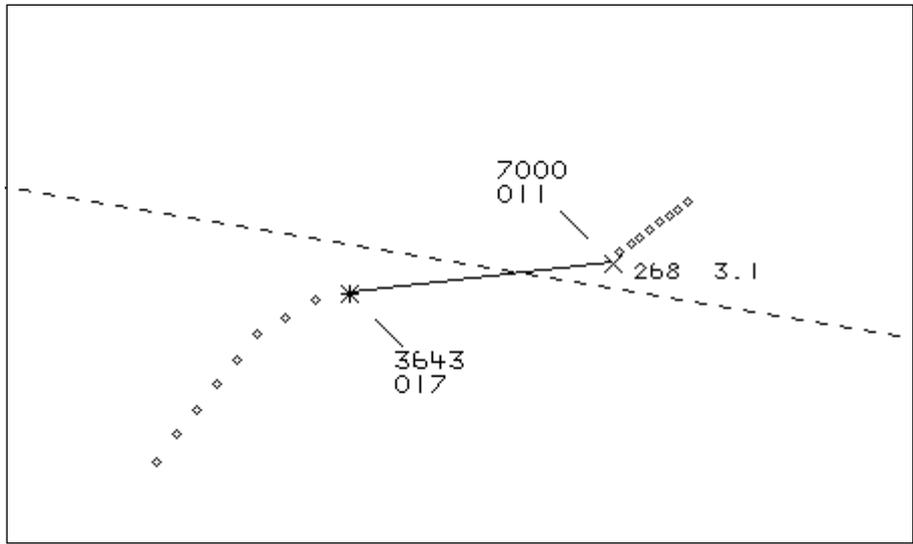


Figure 4: Incident Geometry at 2020:31

At 2020:38, the MC130H initiated a slow left turn onto a south-south-easterly track. The Tornado crew acknowledged the updated Traffic Information and replied “*looking*” before reporting, at 2020:54, that they were “*visual with that traffic.*” At this point, the MC130H was 1 nm ESE of the Tornado, indicating a climb through 1300ft. In reply, Marham Approach advised the crew “*he’s climbing now, he’s 300 feet below you*” which was acknowledged by the Tornado crew, reporting at 2021:02 that they were “*visual behind.*” The CPA<sup>4</sup> occurred at 2021:06 as the Tornado passed 0.2nm North of the MC130H, indicating 400ft above. Figure 5 depicts the incident geometry at this point. At 2021:07, it is evident on the radar replay that the MC130H is descending, which accords with the pilot’s description of their actions following receipt of a TCAS RA.

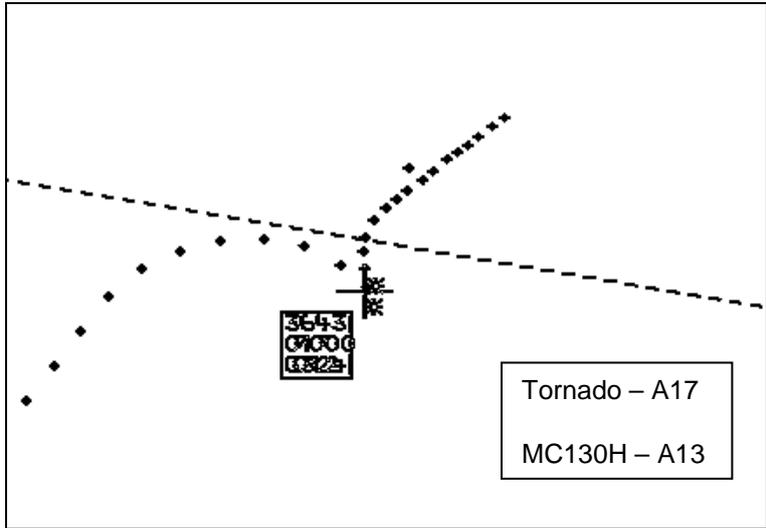


Figure 5: Incident Geometry at 2021:06.

<sup>4</sup> Closest Point of Approach

Figure 6 below is an extract from the 1:250 000 chart of the local area, with the approx position of the NOTAM'd MTA<sup>5</sup>.



Figure 6: Chart depicting approx position of MTA.

From an ATM perspective, given that the aircraft squawking SSR 3A 7000 entered the MTA, a hindsight bias argument could be constructed to suggest that Marham Approach could have assumed that the aircraft was operating in association with the NOTAM Y2556/13 MTA. However, BM SPA contends that it would be inappropriate to extend this argument to include an assumption that the aircraft was engaged in para-dropping duties. Mode A code 0033 is allocated for the use of aircraft engaged in para-dropping activities, to allow ATS units with a surveillance capability to identify aircraft engaged in such duties and to take appropriate action. Moreover, its method of utilisation is clearly highlighted within the UK AIP. Thus, given that NOTAM Y2556/13 permitted ATS units to vector aircraft through the MTA when para-dropping activities were not taking place, it is reasonable to argue that, from Marham Approach's perspective, this is what occurred.

## Comments

### HQ Air Command

Notwithstanding the origin or type of mission being undertaken by the ac squawking 7000, it was the responsibility of the Tornado crew to ensure adequate deconfliction from the reported traffic. It appears that the visual assessment of separation was inadequate, possibly due to the light levels at dusk, when the incident occurred. Whilst the Situational Awareness provided by Marham Approach appears to have been good, TCAS would have provided the Tornado crew with further cueing of the impending Airprox.

### USAFE

Airdrops at Sculthorpe are carried out frequently after sunset and later; because Sculthorpe lies within the UKNLFS Night Rotary Region 1, procedures were developed to enable MC-130H

<sup>5</sup> Mandatory Temporary Avoidance

aircraft to carry out airdrops on the airfield and thus, the NOTAM MTA is a regular event. On this occasion, the MC-130H was in contact with Anglia Radar throughout; normally the aircraft would squawk 3/A 7001 but, due to oversight, 3/A 7000 was retained on this occasion. The UK AIPs refer to the use of 3/A 0033 for the dropping of parachutists at the pilot's discretion; given that the aircraft was involved in equipment drops from low-level within an MTA, its use was thought inappropriate. It is of note that the NOTAM at Fig 1 differs in significant detail from the copy the Squadron received:

(H3540/13 NOTAMN  
Q) EGTG/QWPLW/IV/M /W /000/045/5253N00052E008  
A) EGTG B) 1307302000 C) 1308020100 D) 30 2000-2300, 31 2000-2359, 01 2000-0100  
E) PJE WI AREA BOUNDED BY 525430N 0010300E -524636N 0004430E -  
525130N 0003918E - 525930N 0005700E - 525430N 0010300E (SCULTHORPE,  
NORFOLK). 13-07-0836/AS 4  
F) SFC G) 4500FT AMSL)

[UKAB Note: This is the H Series NOTAM which provides a warning to civilian pilots, Fig 1 shows the Y Series NOTAM, which establishes the MTA applicable to military crews.]

In particular, the crew was unaware of the fact that aircraft could be radar vectored through the MTA under certain circumstances. While not excusing any omissions of the part of the crew, the Sculthorpe MTA is active so frequently that we are surprised that the existence of the NOTAM, together with an aircraft carrying out what must be a familiar profile, seemingly did not ring any bells in the mind of the Marham Approach Controller. For the future, Sqn aircraft on similar missions will contact Marham Approach, Norwich Radar and Anglia Radar prior to commencing operations. It is suggested that clearance to radar vector aircraft through the Sculthorpe MTA when active is reviewed.

## Summary

The Airprox occurred 12.8nm North-east of RAF Marham, at 2021:10 on 31 Jul 13, between an MC130H and a Tornado. The MC130H was conducting airdrop operations at Sculthorpe, in accordance with NOTAM Y2556/13, squawking Mode 3/A 7000 and was not in receipt of an Air Traffic Service. The Tornado was operating within the Radar Training Circuit at RAF Marham, positioning for a heavyweight simulated single-engine instrument approach to RW24, in receipt of a Traffic Service from Marham Approach.

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

Information available included reports from the pilots of both aircraft, transcripts of the relevant RT frequencies, radar photographs/video recordings, reports from the air traffic controllers involved and reports from the appropriate ATC and operating authorities.

From the very start of the discussion, it was clear to the Board that a critical element of this Airprox was a lack of appreciation of the MTA NOTAM, and an assumption that it was not active. Some members opined that the Tornado crew would have known about the MTA from their pre-flight planning and should not have accepted vectors through it without confirming with ATC that it was not in use. Others felt that the Tornado crew might have been lulled into a false sense of security in assuming that Marham Approach would have coordinated their routing with the DZ operators and were simply providing back-up Traffic Information. Given that the MC130H was on its second pass through the MTA, many of the Board members felt that the Approach controller should reasonably have deduced that it was operating within the 'hot' MTA and should have offered vectors to the Tornado crew to route them either laterally or vertically around the MTA. A few Members opined that, without the 0033 squawk, it was reasonable for Marham Approach to vector aircraft through the MTA on the assumption that the MC130H was not conducting air-drop activities; however, other Members noted that the NOTAM stated that aircraft could be vectored through the MTA only if it was positively 'known' that there were no air drops taking place – they did not agree that an absence of a 0033

Squawk constituted 'knowing' and, contrary to the BM SPA analysis, they felt that the assumption should have been in the 'fail-safe' sense in that Marham Approach should have assumed that the MC130H aircraft (which was clearly inside the MTA) was conducting air drops, unless he had positively determined otherwise. More worryingly, given the proximity of the Sculthorpe DZ and Marham, the Board was surprised that the units did not have robust procedures in place to ensure Marham ATC was notified of the activation and de-activation of the DZ and MTA; the Board therefore made a recommendation that Marham and the DZ owners review their co-ordination and operating procedures.

With regard to the MC130H's squawk, although it was not squawking Mode 3/A 0033, it was noted that the UK AIP allows pilots discretion on selecting that squawk; the USAFE advisor informed the Board that the crew had consciously chosen not to Squawk 0033 as they felt the wording of the UK AIP was referring to dropping parachutists and their task was to air-drop cargo. The Board made a recommendation to clarify the use of the 0033 squawk for all air-dropping and parachuting activities. The issue of squawking 7000 vs 7001 was not felt by the Board to be germane; given that the MC130H was on its second pass, and its Mode C and track were commensurate with an air-dropping profile, the Board agreed that ATC should have erred on the side of caution and assessed that it was operating in the MTA.

The Board noted that the Tornado crew had been given Traffic Information on the MC130H, had seen it early on, and had been content with the separation throughout. As a result, when discussing the cause of the Airprox there was some debate about the relative responsibilities of Marham ATC and the Tornado crew. During this debate, it was noted that the Tornado crew had taken a long time to execute the turn instruction issued by Marham Approach; however, the ATC Members agreed that, given that it was a home-base aircraft, the controller should have been aware that a Tornado in the single-engine heavy-weight configuration would be relatively unmanoeuvrable and slow to turn; the controller should have allowed for this.

The Board discussed the degree of risk and noted that the Tornado crew had maintained visual contact with the MC130H throughout but that their configuration would have limited their ability to manoeuvre rapidly. It was clear that the MC130H's TCAS had worked in a timely and effective manner and, although there were many lessons to learn from this event, the Board therefore concluded that the risk was Cat C (effective and timely actions were taken to prevent the aircraft colliding).

### **PART C: ASSESSMENT OF CAUSE AND RISK**

Cause: The Marham Approach controller vectored the Tornado crew through a NOTAM'd military MTA and into conflict with the MC130H.

Degree of Risk: C

ERC Score<sup>6</sup>: 10

Recommendations:

1. Marham and Mildenhall review the coordination and SOPs for operations at Sculthorpe.
2. The CAA review the applicability of conspicuity squawk '0033'.

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<sup>6</sup> Although the Event Risk Classification (ERC) trial had been formally terminated for future development at the time of the Board, for data continuity and consistency purposes, Director UKAB and the UKAB Secretariat provided a shadow assessment of ERC.