# ACP-2020-024

# E-7 Wedgetail Operating Areas

## STAGE 3

## ENGAGEMENT DOCUMENT

## V2.0

Ministry of Defence

# Responsible Authors of this Document

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| Revision Number | Affected part | Revised By | Notes |
|---|---|---|---|
| Initial Issue V1.0 | | Project Lead | |
| V2.0 | Document rewrite | Project Lead | Rewrite following CAA feedback to V1.0 |

# Contents

## Glossary of terms

| | |
|---|---|
| AARA | Air-to-Air Refuelling Area |
| ACP | Airspace Change Proposal |
| ADSB | Automatic Dependent Surveillance-Broadcast |
| ADQ | Aeronautical Data Quality |
| AEW | Airborne Early Warning |
| AIP | Aeronautical Information Publication |
| AIRAC | Aeronautical Information Regulation and Control |
| Airprox | Air Proximity |
| ALARP | As Low As Reasonably Practicable |
| ANSP | Aeronautical Navigation Service Provider |
| ASACS | Air Surveillance And Control System |
| ASIMS | Air Safety Information System |
| ATC | Air Traffic Control |
| ATS | Air Traffic Service |
| BGA | British Gliding Association |
| CAA | Civilian Aviation Authority |
| CAP | Civilian Aviation Publication |
| DA | Danger Area |
| DAATM | Defence Airspace and Air Traffic Management |
| DASOR | Defence Air Safety Occurrence Report |
| EAMTA | East Anglia Military Training Area |
| FGEN | Force Generation |
| FHQ | Force Head Quarters |
| FIR | Flight Information Region |
| FL | Flight Level |
| FRA | Free Route Airspace |
| FUA | Flexible Use of Airspace |
| GAT | General Air Traffic |
| ISD | In Service Date |
| ISTAR | Intelligence, Surveillance, Target Acquisition and Reconnaissance |
| MAA | Military Aviation Authority |
| MDA | Managed Danger Area |
| MESA | Multi-role Electronically Scanned Array |
| MOD | Ministry of Defence |
| MoU | Memorandum of Understanding |
| NATS | National Air Traffic Services |
| NATO | North Atlantic Treaty Organisation |
| NM | Nautical Mile |
| NERL | NATS En Route plc |
| RA | Resolution Advisory |
| RAF | Royal Air Force |
| SA | Situational Awareness |
| SoN | Statement of Need |
| Sqn | Squadron |
| TCAS | Traffic Collision Avoidance System |
| TMA | Terminal Control Area |
| TRA(G) | Temporary Restricted Area (Gliding) |
| UIR | Upper Information Region |
| USAFE | United States Air Force Europe |

## Introduction

This document forms part of Stage 3 of the Airspace Change Proposal ACP-2020-024 and has been prepared in accordance with Civil Aviation Publication (CAP) 1616. It should be noted that in Dec 2023, the Change Sponsor was informed the CAA had reallocated this ACP from a Level 2c to a Level 3 (low impact ACP)[1]. As of 02 January 2024, the ACP will follow guidance set out in CAP 1616 Version 5[2]

The aim of this document is to provide Stakeholders with the information that they require in order to fully understand the MoD's proposal to generate new E-7 Wedgetail Operating Areas. This document will allow all Stakeholders to provide feedback on the airspace options as part of the Targeted Engagement.

The scope of this Targeted Engagement is limited to the generation of new E-7 Wedgetail Operating Areas in the London and Scottish Upper Information Regions (UIRs).

This document provides context to the proposal, including background to the extant E-3 Operating Areas and usage and why the MoD is seeking to introduce new E-7 Operating Areas.

Statement of Need (SoN):

Currently the E-3D Sentry AEW Mk 1 utilises the UK AEW[3] areas for UK training and operations. In 2023[4] the E-7 Airborne Early Warning Wedgetail Mk 1 will enter RAF service. Though fulfilling the same role as the Sentry, advances in technology mean that the Wedgetail will not be able to utilise exactly the same operating areas. The Wedgetail will be required to fly approximately 100 nm by 20 nm areas. Best use can be made of some of the existing operating areas (e.g. UK 1, 7 and 9) as they are both large enough to accommodate the Wedgetail flight profile and are appropriately located to enable Wedgetail to provide a service to its forecast traffic and trade. The existing orbit areas may still be utilised by NATO/visiting forces partners as the UK will retain its NATO commitment in this respect. Therefore, whist the extant operating areas must remain in place for the time-being, there is a requirement for new operating areas to be created where the current areas are not sufficient.

Several iterations of stakeholder engagement have already been conducted up to this point. In conjunction with the Option Appraisals, the MoD has developed an airspace option to generate new E-7 Wedgetail areas. In accordance with CAP 1616h, the Change Sponsor is seeking to undertake Targeted Engagement with the stakeholders identified in the Engagement Strategy[5]: the National Air Traffic Service (NATS) En Route plc (NERL)[6]; the British Gliding Association (BGA) and MOD stakeholders via DAATM.

[1] Email dated 12/12/2023: ACP-2020-024 E-7 Wedgetail Airborne Early Warning Mk1 Orbit Areas Change - CAP1616 V5 Transition Arrangements
[2] The processes for conducting Level 3 Airspace Change Proposals and Pre-Scaled Airspace Change Proposals are contained in CAP 1616h – Guidance on Airspace Change Process for Level 3 and Pre Scaled Airspace Change Proposals
[3] Airborne Early Warning
[4] E-7 In Service Date (ISD) has moved to Q2/3 2025.
[5] All documents can be viewed at https://airspacechange.caa.co.uk/PublicProposalArea?pID=228
[6] NERL is the single POC representing NATS for the ACP, acting as conduit for engagement across all applicable NATS departments

# Section 1 – Context

## E-3D/E-7 Overview

1.1 Since 1991 the E-3D AEW Mk 1 Sentry has been the Royal Air Force's Airborne Early Warning and Control (AEW&C) platform. The aircraft have also sat as part of the NATO AEW&C fleet, contributing a 25% share of force output on training and operations. Developments in technology elsewhere, and the ageing of the airframes, has reduced the operational effectiveness of the E-3D fleet and so, in 2018, the UK MOD elected to replace the E-3D with the more modern, 5th generation E-7 AEW Mk1 Wedgetail. Currently operated by air forces in Australia, Turkey and South Korea, the aircraft represents a step change in capability and will bring the UK's airborne command and control capability into the 21st century. In order to capitalise on this new capability to the utmost, airspace change is required to enable most effective use of the E-7 sensor suite.

## Basis for creation of E-7 Wedgetail Operating Areas

1.2 The now obsolete RAF E-3D Sentry and the NATO E-3A operated throughout the UK in a series of dedicated operating areas. The E-3A will continue to use these areas until 2035 when it is due to go out of service. The E-3D flew in circular orbits (normally 15nm radius) or between 2 x orbits in a racetrack pattern. The circular orbits were contained in the larger E-3 operating areas. The E-7 Wedgetail is fitted with an advanced Multi-role Electronically Scanned Array (MESA) radar; to optimise its performance the aircraft needs to fly in long straight legs of approx. 100nm. The proposed E-7 Operating Areas are racetracks of approx. 100nm x 20nm which will allow this to occur. Unfortunately, not all the E-3 operating areas are large enough to accommodate the100nm legs required for the E-7, some are in the wrong geographical location/orientation and sometimes are a combination of both. Therefore, dedicated new areas are proposed for the E-7 Wedgetail. Wherever possible these areas have been geographically located in the vicinity of the E-3D operating areas. The areas are proposed in the height band FL270 – FL350 and are non-segregated which allows airliners to transit simultaneously to E-7 ops, as long as minimum lateral and vertical separation is maintained by ATC. The areas are intended to be tactically controlled by ATC.

1.3 In order to meet the operational and training requirements for the E-7 the following assumptions were agreed at Stage 1:

- The areas will be non-segregated.
- The defined areas will allow interaction on the NATS equipment to ensure controllers are alerted to potential confliction.
- Confliction resolution will be tactically managed against the specific aircraft, not the airspace.

- The airspace will define the scope of the area where the E-7 has non-deviating status, which is similar to how the E-3D operated.

- The levels required for the areas will be fully contained in Class C airspace.

1.4 Without designated E-7 Operating areas the MOD will be less likely to efficiently meet its mandated Defence Tasks with greater workload on pilots, airborne Wedgetail controllers and NATS ATC controllers. The RAF will be unable to provide optimal air surveillance and control of UK Fast Jet aircraft in the security and defence of UK sovereign airspace if new designated operating areas are not agreed.

1.5 The 21 proposed E-7 Operating Areas are shown in Figs 1-3 below (A1, A2, B2 etc) and are highlighted in red (oval racetrack shapes). The yellow shaded areas depict the current E-3 operating areas.

Note 1: Figures 1-3 divide the UK into North, Central and South regions. This is solely for ease of viewing of the chart in this document and there are no designated North, Central and South AEW Areas.

Note 2: The charts are for illustrative purposes only, and are based on the ENR6-70 NATS UK | AIP (ead-it.com).

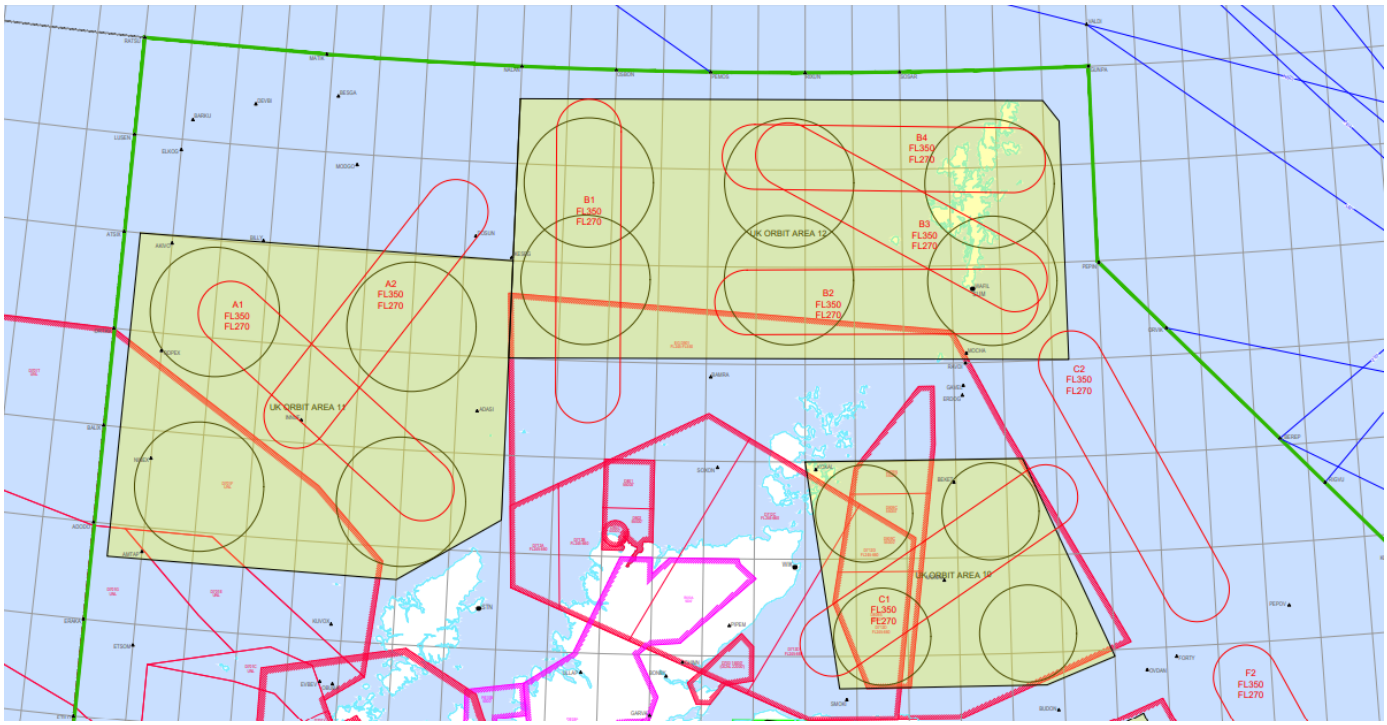

Figure 1 – Proposed E-7 Operating Areas North UK (red racetracks)

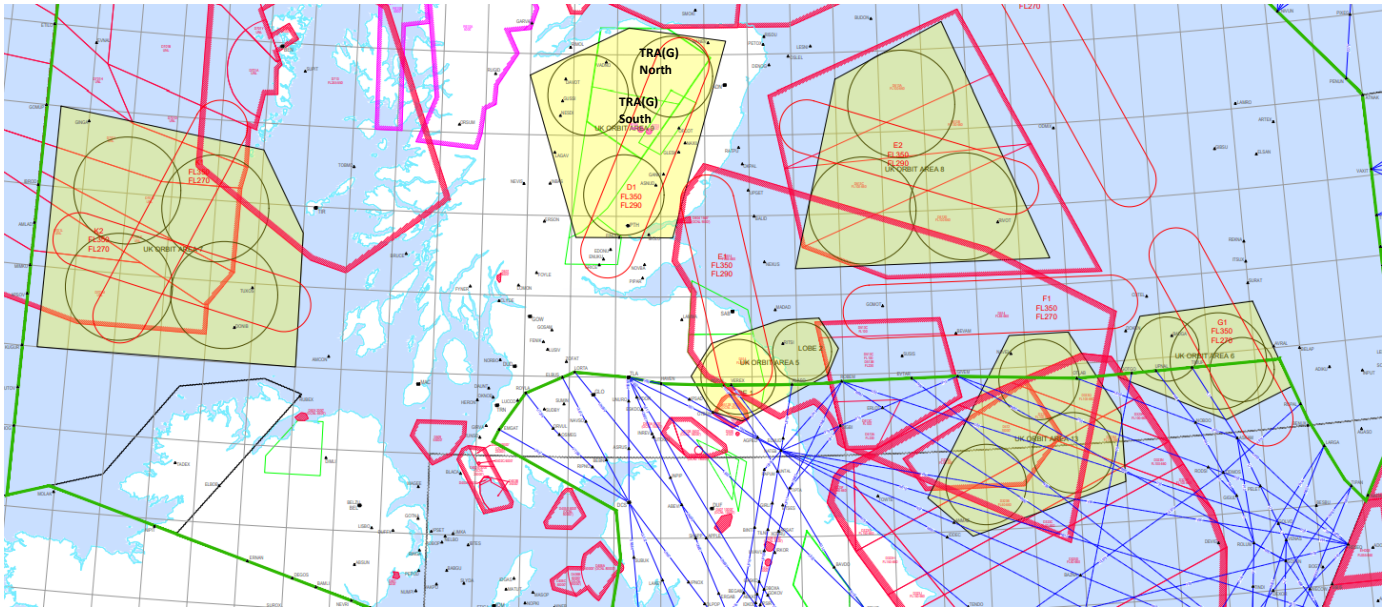


Figure 2 – Proposed E-7 Operating Areas Central UK (red racetracks)

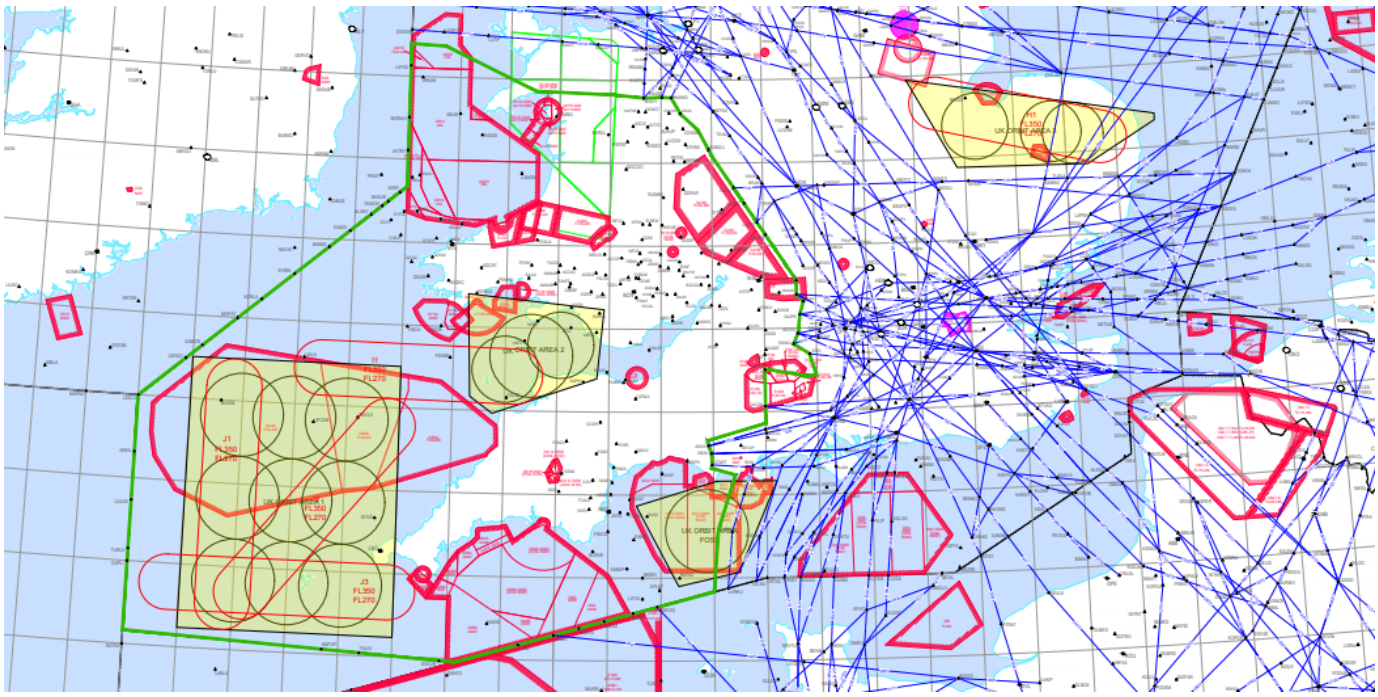

Figure 3 – Proposed E-7 Operating Areas South UK (red racetracks)

**Evolution of airspace structures**

1.6 Following initial discussions with NATS, feedback was broadly in support of the proposed E-7 operating areas as the majority were superimposed over the extant E-3 operating areas that have been successfully activated, controlled and co-ordinated for many years. There have been subsequent meetings and correspondence between the

Change Sponsor and the initially identified key Stakeholder, NATS to refine the positions of the proposed operating areas. The aim was to limit the effect on civilian Air Traffic Services (ATS) and Free Route Airspace (FRA) routings in both the London and Scottish UIRs. These included:

- Reshaping of all the proposed E-7 operating areas from rectangular boxes to racetracks as this freed up airspace in each of the 4 corners where the E-7 could never operate. This proved significant in East Anglia (Operating Area Ref: H1) and allowed NATS to deconflict from significant reporting points/FRA routes/trajectories.

- Redefining the anchor point[7] and orientation of one area in the southwest of England to relocate it into a single ATC sector and avoid FRA trajectories to the oceanic boundary (Operating Area Ref: I1).

- Redefining the anchor point and orientation of the area to the north of Ireland to prevent it crossing 10W into Shanwick Airspace (Operating Area Ref: K1).

- Combining 2 areas into 1 slightly larger area (Operating Area Refs: E2 and F1) to deconflict with traffic enroute to/from Copenhagen.

- Raising the base of several areas form FL270 to FL290 (Operating Area Refs: D1, E1 and E2) to deconflict with Aberdeen and Scottish Terminal Manoeuvring Area (TMA) Arrivals/Departures.

- Redefining the anchor point and size of one area in the North Sea to assist handovers to/from Copenhagen (Operating Area Ref: F1).

1.7 This engagement has ensured both NATS and the MOD have optimal use of airspace with minimal operational impact on both parties.

1.8 Discussions have also taken place with the British Gliding Association (BGA) as one of the proposed areas (Operating Area Ref: D1) impacts on the Scottish TRA(G) - Areas North and South above FL240. Tactical coordination with ATC will resolve this conflict on a daily basis on the few occasions gliding occurs above FL290 (base of D1).

1.9 As a result of the engagement with NATS and the BGA, the MOD tasked NATS to produce (Aeronautical Data Quality (ADQ_ compliant data for all the proposed E-7 operating areas which will ultimately be published in the requisite Aeronautical Information Regulation and Control (AIRAC) amendment in early 2025.

[7] An anchor point is a co-ordinate on which the racetrack is designed.

**Potential Impacts of proposed areas on existing environments/ATS structure**

1.10 Engagement to date intended to ensure NATS and the MOD have optimal use of airspace with minimal operational impact on initially identified stakeholders, as described below.

- The proposed areas will be managed in the same way that existing E-3D operating areas are now.
- The operating areas are proposed to be non-segregated.
- The proposed operating areas will be tactically controlled.
- Civilian air traffic could be tactically routed through all proposed operating areas.
- Only 1 of the 21 proposed operating areas will routinely be activated at any one time.
- Weekend activation will be by exception.

Proposed operating areas are intended to impress a minimal impact on civilian air traffic routings throughout the London and Scottish UIRs and were positioned following liaison with NATS. NATS will review any extant ATC standing agreements with adjacent UIR/FIRs and instigate any amendments to them with respect to handover of traffic.

1.11 The 21 proposed E-7 Operating Areas have been broken down into geographical sub areas and are shown below in Figures 4 - 11. Information on operating heights, co-location with extant E-3 areas (where applicable), frequency of usage and conflicts with other significant airspace is also highlighted.

**Outer Hebrides**

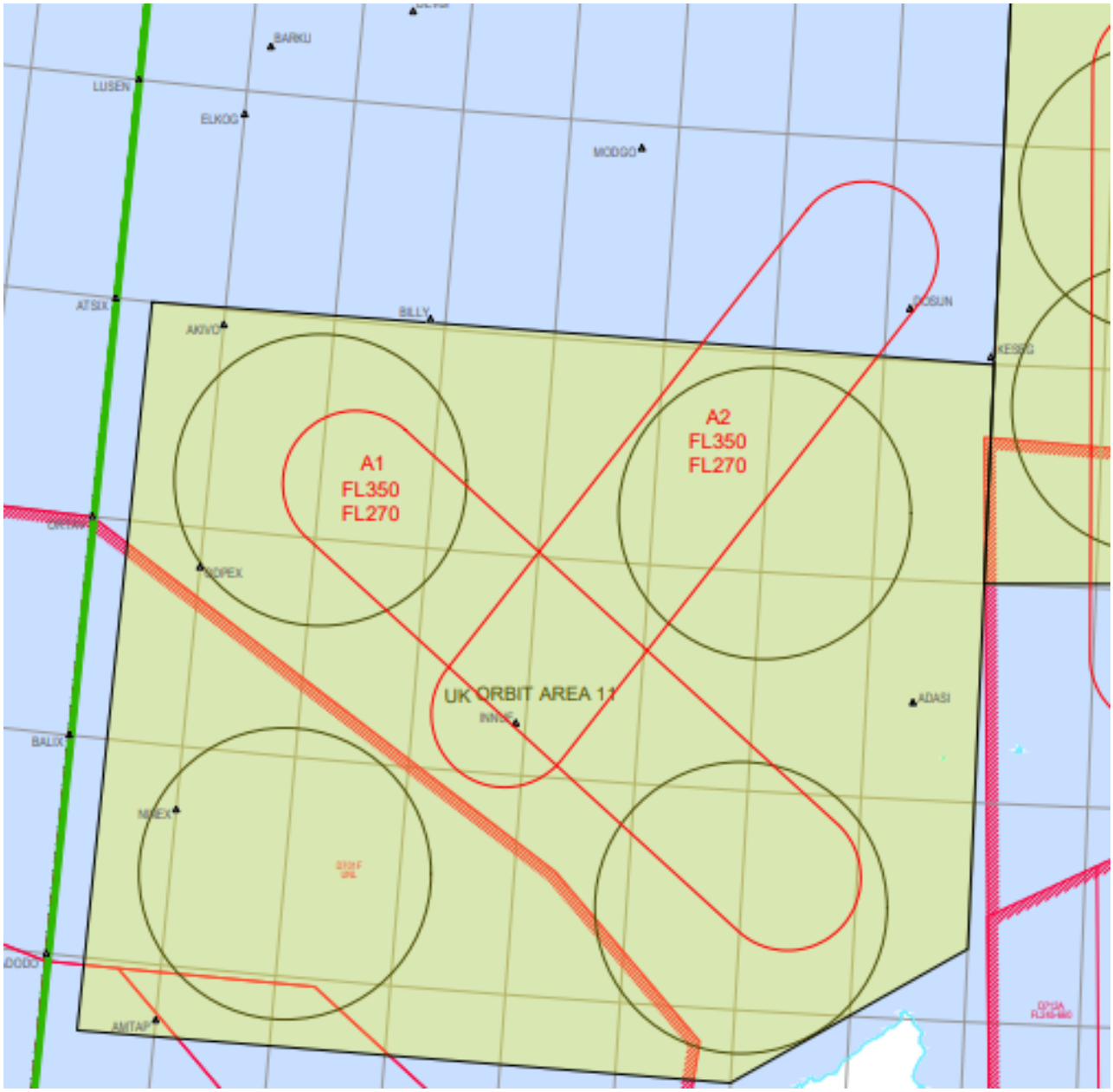


Figure 4 – A1 and A2 Outer Hebrides

- FL270 – FL350.
- Located within extant E-3 operating area UK-11.
- Minimise impact on FRA.
- NATS and MOD agreed location/heights.
- Frequency of Usage – Medium (activated on approximately monthly basis).

## North Cape and Shetlands

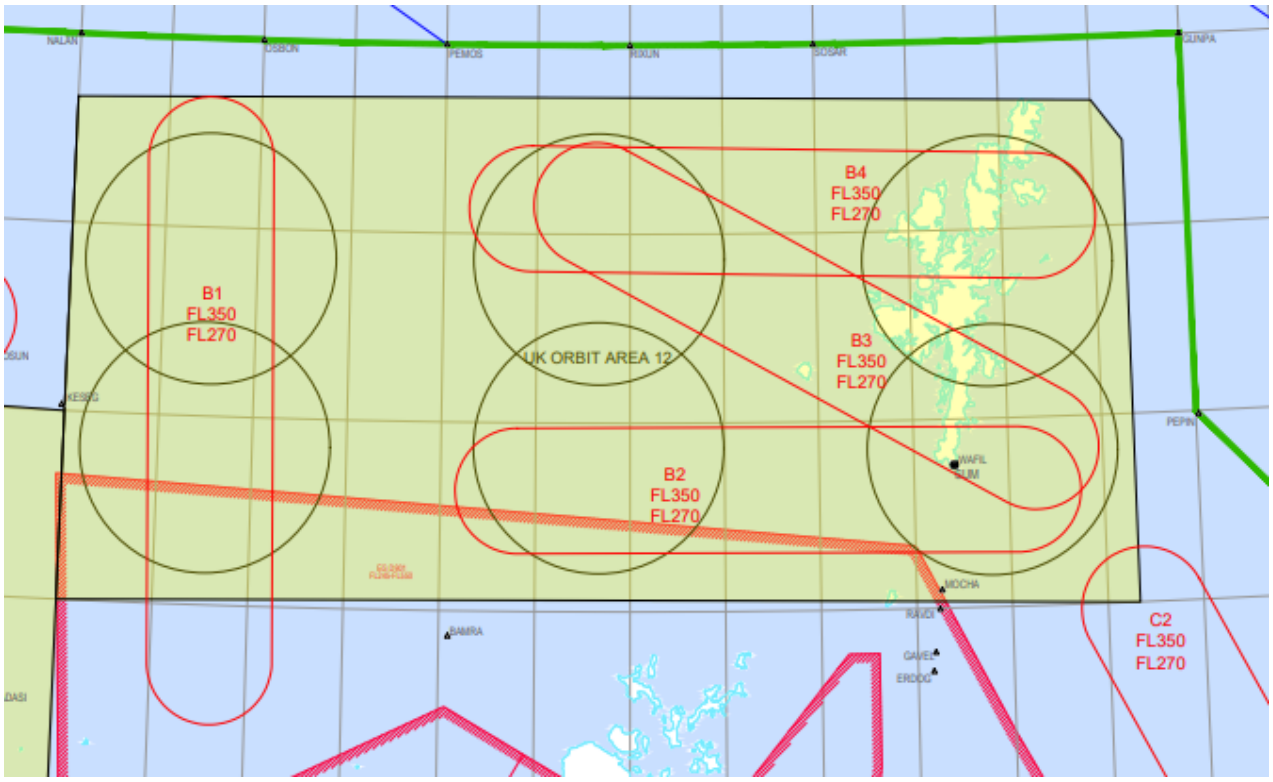


Figure 5 – B1 to B4 North Cape and Shetlands

- FL270 - FL350
- B2 to B4 predominantly within bounds of extant E-3 operating area UK-12.
- Area B1 extends south towards EGD712.
- Minimise impact on FRA.
- Co-ordination with Swanwick Military ATC (78 Sqn) regarding concurrent activation with EGD712.
- NATS and MOD agreed location/heights.
- Frequency of Usage – Medium (activated on approximately monthly basis).

**Moray Firth**

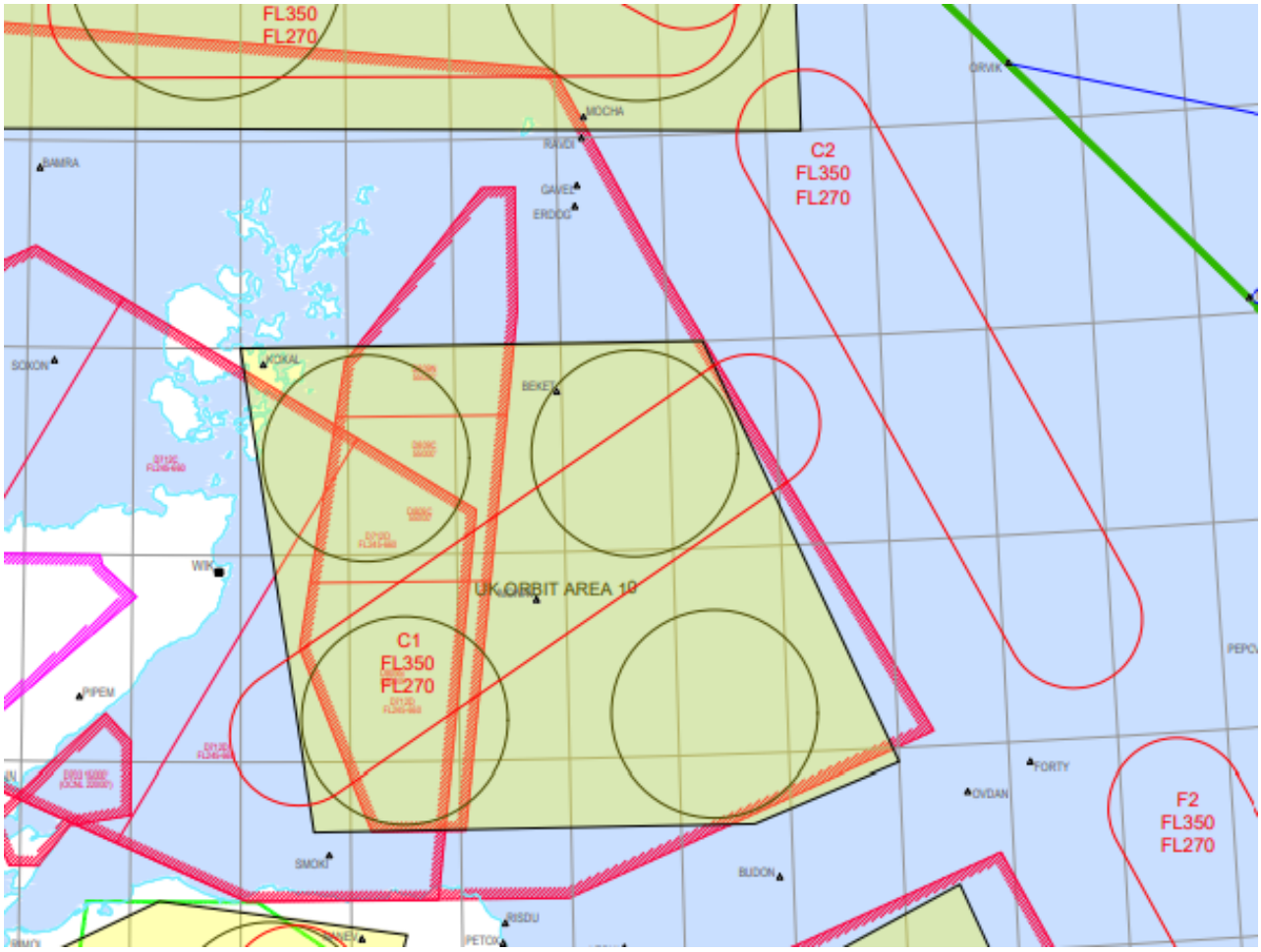


Figure 6 – C1 and C2 Moray Firth

- FL270 – FL350.
- C1 predominantly within extant E-3 operating area UK-10.
- Some overlap with EGD712 and EGD809 series (up to FL550). Coordination with 78 Sqn.
- C2 new area to E of UK-10. Overlap with Air-to-Air Refuelling Area (AARA) 2 (FL100-290) – coordination via 78 Sqn or pre-flight planning.
- Minimise impact on FRA.
- NATS and MOD agreed location/heights.
- Frequency of Usage – High (activated on approximately weekly basis).

**Scottish Highlands and East Coast**

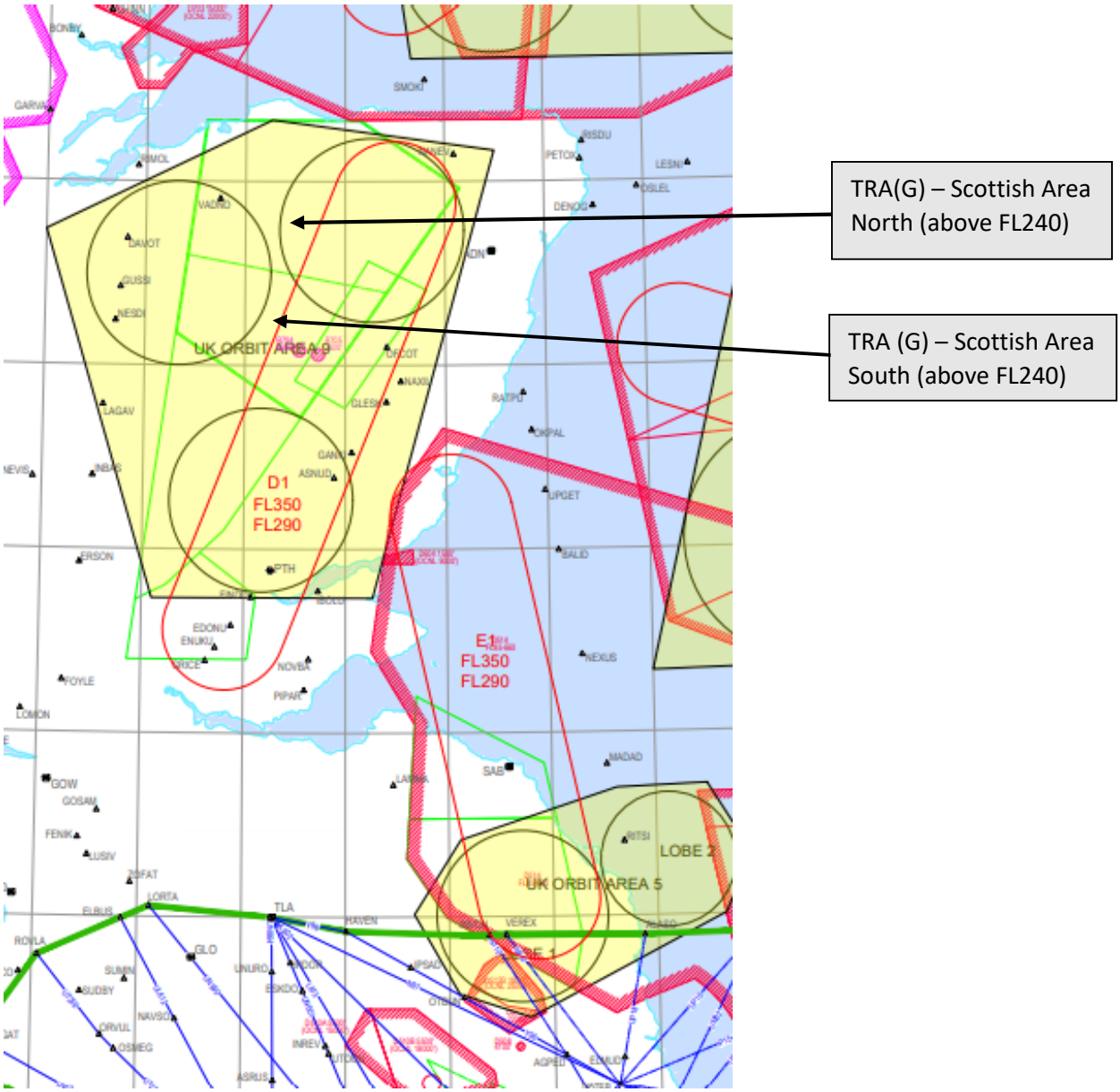


Figure 7 – D1 Scottish Highlands and E1 East Coast

- FL290 – FL350 (Base level raised from FL270 following NATS engagement).
- Predominantly within extant E-3 operating area UK-9.
- When EGD714 is active operating area E1 will not be utilised.
- Minimise impact on high level air routes and FRA.
- NATS and MOD agreed location/heights.
- Frequency of Usage – High (activated on approximately weekly basis).
- Gliding – TRA(G) Scottish North & South exist above FL240 and overlap D1. Tactical co-ordination with ATC as per extant operations in UK-9. Memorandum of Understanding (MOU) with Swanwick Mil to be reviewed and amended as required. Activity predominantly at weekends when E-7 flies by exception. E-7 can relocate when TRA(G) active.

**East Coast**

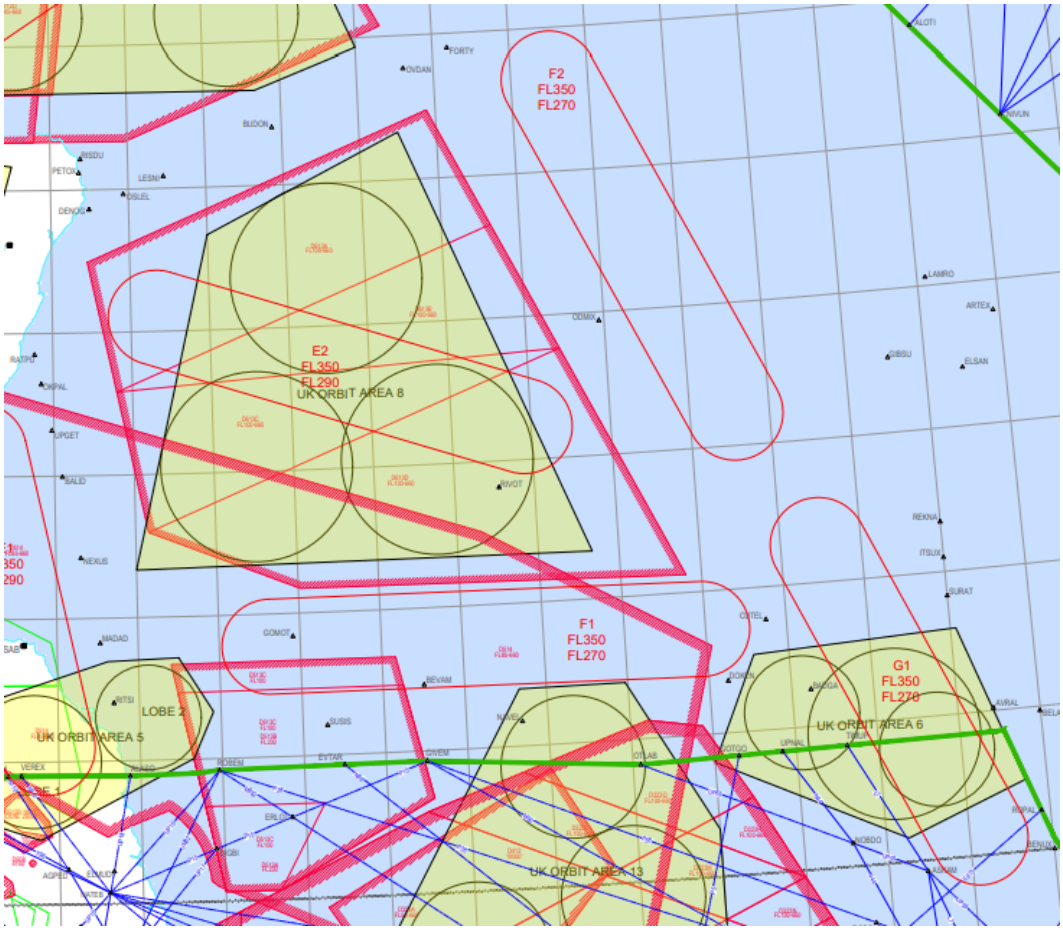


Figure 8 – E2 East Coast, F1, F2 and G1 North Sea

- FL290 – FL350 (Base level raised from FL270 following NATS engagement).
- E2 located within EGD613. Coordination with 78 Sqn/ Air Surveillance and Control System (ASACS) for activation.
- Minimise impact on high level air routes and FRA.
- NATS and MOD agreed location/heights.
- Frequency of Usage – High (activated on approximately weekly basis).

**North Sea**

- FL270 – FL350
- F1 located above AARA5 (FL070-240) and between EGD323 and EGD613 series danger areas, activation/coordination will be managed through 78 Sqn/ ASACS.
- F2 to East of EGD613 complex and within top bracket of AARA3 (FL100-290) – activation/coordination will be managed through 78 Sqn/ASACS.
- When EGD714 is active, operating area F1 will not be utilised.
- Minimise impact on high level air routes and FRA.
- NATS and MOD agreed location/heights.
- Frequency of Usage – High (activated on approximately weekly basis).

**East Anglia**

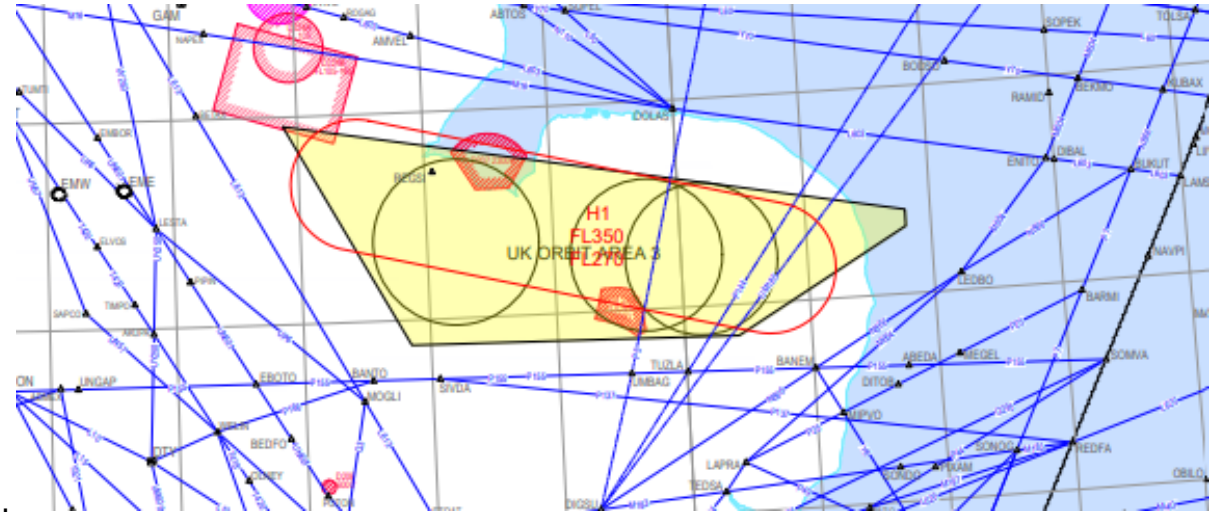


Figure 9 – H1 East Anglia

- FL270 – FL350
- In vicinity of extant E-3 area UK-3 and within the East Anglia Military Training Area (EAMTA).
- Minimise impact on high level air routes and future FRA trajectories due to infrequent activation. Only likely to be used for National Defence/Security tasking.
- NATS and MOD agreed location/heights.
- Frequency of Usage – Low (activated approximately once a month or less).

**Bristol Channel**

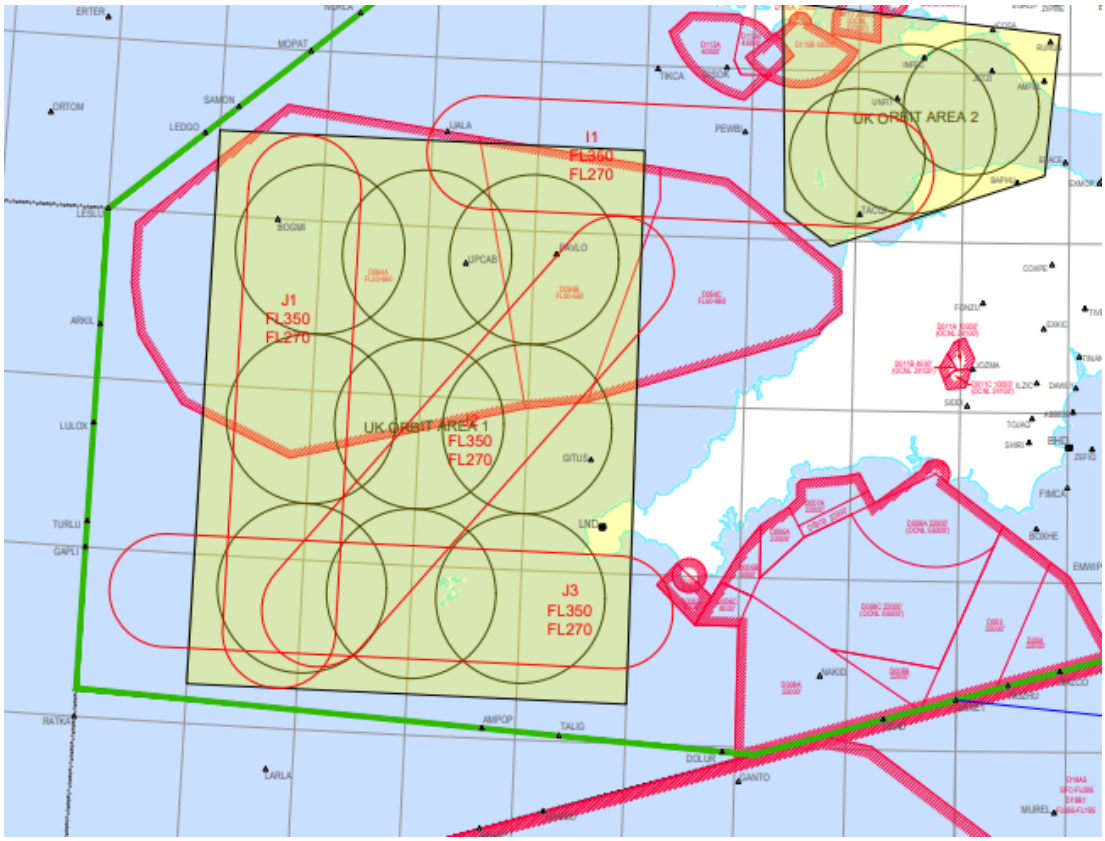


Figure 10 – I1 Bristol Channel and J1 to J3 Southwest Approaches

- FL270 – FL350
- Partially contained within boundaries of extant E-3 area UK-2.
- Overlap with EGD064 danger area complex, and AARA12 (FL070-280), activation/coordination by 78 Sqn/ASACS.
- Minimise impact on FRA.
- NATS and MOD agreed location/heights.
- Frequency of Usage – Low (activated approximately once a month or less).

**Southwest Approaches**

- FL270 – FL350
- Predominantly contained within boundaries of extant E-3 area UK-1, the exception being J3 which extends slightly E and W.
- Overlap with EGD064 danger area complex, and AARA11 (FL080-260) and AARA12 (FL070-280), activation/coordination by 78 Sqn/ASACS.
- Minimise impact on FRA.
- NATS and MOD agreed location/heights.
- Frequency of Usage – Low (activated approximately once a month or less).

## Benbecula

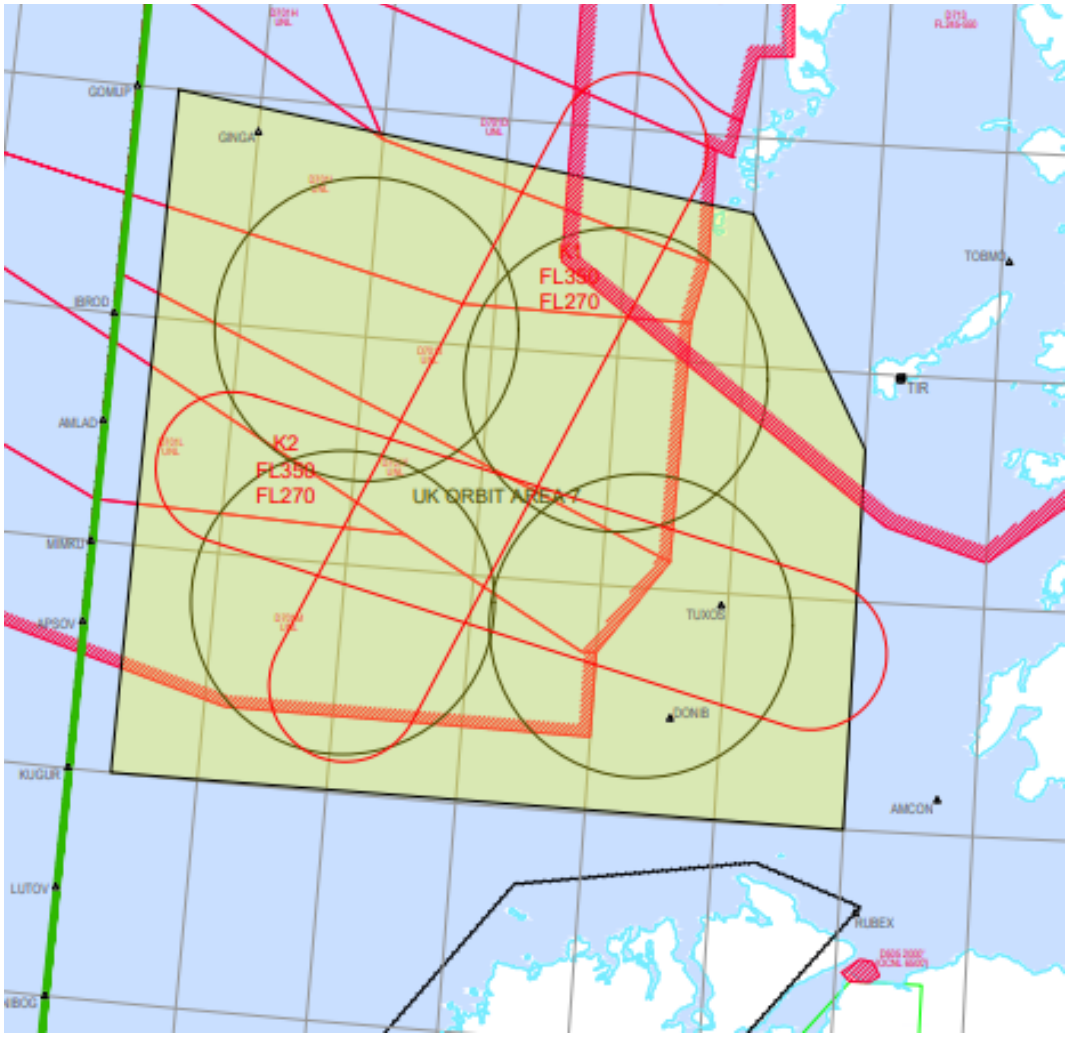


Figure 11 – K1 to K2 Benbecula

- FL270 – FL350
- Predominantly contained within boundaries of extant E-3 area UK-7.
- Overlap with EGD701 Danger Area series. Benbecula range activation/coordination required through 78 Sqn/ASACS.
- Minimise impact on FRA.
- NATS and MOD agreed location/heights.
- Frequency of Usage – Low (activated approximately once a month or less).

## Airspace Stakeholders

1.12 The MoD requirement for the E-7 Operating Areas FL270 – FL350 is a significant factor in reducing the impact on other airspace users and therefore, reduces the number of local airspace stakeholders to be targeted.

1.13 Rationale for selected stakeholders is described in the Engagement Strategy[8] and has been broken down into the following groups.

1.14 External Aviation Stakeholders.

| External Stakeholders | | |
|---|---|---|
| NATS[9] | British Gliding Association (BGA) | NATO E3 Force[10] |

1.15 Internal MOD Stakeholders.

| Internal MoD Stakeholders (*via DAATM) | | |
|---|---|---|
| HQ 1 Group* | 11 Gp A7* | |
| Military Aviation Authority (MAA)* | Defence Airspace and Air Traffic Management (DAATM) | Swanwick Military ATC (78 Sqn)* |

[8] All documents can be viewed at https://airspacechange.caa.co.uk/PublicProposalArea?pID=228

[9] NERL are the single POC representing NATS for the ACP, acting as conduit for engagement across all applicable NATS departments

[10] Co-ordination and liaison via ISTAR FHQ

# Section 2 – Proposed Options

## Design Principles

2.1 At Stage 1 the Change Sponsor, with feedback from Stakeholders, established a set of Design Principles in which to guide the airspace design options. The design principles agreed at the Stage 1 and 2B Gateway are as follows:

| DP ID | Agreed Design Principle |
|---|---|
| a | Must be safe. The defined airspace must provide ATS providers a known traffic environment to ensure safe separation against (General Air Traffic (GAT). |
| b | Defined areas must be sufficient in location to achieve training and operational objectives. |
| c | Defined areas must be the minimum dimension to achieve task. |
| d | Minimise the impact to Commercial Air Traffic flow, sector complexity and sector capacity. |
| e | Airspace management and FUA principles will be applied to ensure collaborative decision-making protocols and management processes are established. |
| f | Defined areas shall not be segregated airspace but will align to current or revised procedures detailed within current NATS/MOD interface documents. |
| g | The defined areas will detail the separation standard required between GAT and the OAT using the designated area. |
| h | The design shall seek to rationalise existing areas where appropriate. |
| i | The design shall minimise the impact on all ATM stakeholders. This will include NATS and other ANSPs (including foreign ANSPs) so as not to over complicate airspace, sector design and service provision. |

## Design Option Introduction

2.2 The Change Sponsor examined 3 options with respect to new operating areas for the E-7 Wedgetail:

- The “do nothing option” (Option 0) which was to operate in extant E-3 operating areas despite them being of incorrect dimensions and geographical orientation to optimise the E-7 Multi-role Electronically Scanned Array (MESA) radar.

- The “do minimal option” (Option 1) which was to operate in existing DAs and modified E3 areas. Once again this failed to allow the E-7 to operate in optimal

locations and in the optimal orientation resulting in a degraded radar picture and degraded operational output.

- Create dedicated E-7 areas (Option 2) which endeavoured to meet the E-7 operational output whilst having minimal impact on civilian air traffic services and aircraft routings[11].

**Summary of Option 0 Full Appraisal**

2.3 Option 0, the do-nothing option, aimed to examine whether alternatives existed which would still allow the RAF Air Surveillance and Control System (ASACS) force to conduct their training and operational tasks in accordance with the SoN. The ability to continue to operate in the extant E-3 areas would place limitations on the new surveillance radar and ultimately affect the radar picture and level of safe control that the aircraft could provide to other air systems. This would result in an inability to meet specific Defence Tasks mandated to the ASACS force. Finally, evaluating this option against the 9 Design Principles it can be seen that it met 7 of the principles but not:

- DP(b) - Defined areas must be sufficient in location to achieve training and operational objectives.

- DP(c) - Defined areas must be the minimum dimension to achieve the task.

As a result, ongoing Defence Tasks could not be achieved to the same level of intricacy as they are currently; safe and secure radar coverage of UK airspace could not be guaranteed, and safe control of other air systems would be put at risk. This clearly articulates the requirement for an alternate option.

**Summary of Option 1 Full Appraisal**

2.4 Option 1, the do minimum option, aimed to examine whether alternatives existed which would still allow the RAF ASACS force to conduct their training and operational tasks in accordance with the SoN. The ability to continue to operate in modified E-3 areas/MDAs would place limitations on the new surveillance radar and ultimately affect the radar picture and level of safe control that the aircraft could provide to other air systems. This would result in an inability to meet specific Defence Tasks mandated to the ASACS force. Moreover, the unpredictability of operating areas could lead to civil air traffic encountering route deviations, additional track miles being flown and therefore increased CO2 emissions. Finally, evaluating this option against the 9 Design Principles it can be seen that it met 6 of the principles but not:

- DP(b) - Defined areas must be sufficient in location to achieve training and operational objectives.

- DP(c) - Defined areas must be the minimum dimension to achieve task.

[11] Full assessment of all the impacts described below is laid out in the Options Appraisal V2.0 at https://airspacechange.caa.co.uk/PublicProposalArea?pID=228

- DP(f) - Defined areas shall not be segregated airspace but will align to current or revised procedures detailed within current NATS/MOD interface documents.

As a result, ongoing Defence Tasks could not be achieved to the same level of intricacy as they are currently; safe and secure radar coverage of UK airspace could not be guaranteed, and safe control of other air systems would be put at risk. This clearly articulates the requirement for an alternate option.

**Summary of Option 2 Full Appraisal**

2.5 Option 2, create dedicated E-7 Operating Areas aimed to produce the best solution with respect to airspace in which the E-7 Wedgetail could operate in order to allow the RAF ASACS force to conduct their training and operational tasks in accordance with the SoN. **This Option meets all 9 of the Design Principles.** Moreover, this option should have minimal impact on other airspace users and communities with respect to environmental and economic issues[12]. There are minimal financial and other costs involved in the introduction of dedicated E-7 areas. There are also several advantages; these include safety, operational effectiveness, flexible use of airspace and environmental savings. Finally, the creation of dedicated E-7 operating areas allows the MOD to position this air system in the optimum geographical location to maximise the effectiveness of its advanced MESA radar ensuring all training, operational and defence tasks are met. **As such, Option 2 is the preferred option of the Change Sponsor.**

**Summary of Options**

| | Option | Description |
|---|---|---|
| 0 | Do Nothing | Operate in extant E-3 operating areas This will limit the operational effectiveness of the E-7 Wedgetail sensor, hindering its ability to fulfil defence tasks. |
| 1 | Do Minimum | Operate in DA complexes and modified E-3 areas. This will limit the operational effectiveness of the E-7 Wedgetail sensor, hindering its ability to fulfil defence tasks. In many instances, operation outside of the extant E-3 orbits would be required as the current areas are too small. This would reduce predictability and planning for other airspace users, increase complexity and workload for ATS units and limit the tactical effectiveness of the E-7. |
| 2 | Create dedicated E-7 areas | Create new E-7 Wedgetail areas, predominantly co-located with existing AEW operating areas. This option meets all the DPs, enhances safety, reduces complexity, maintains the predictable traffic environment, and meets the operational requirements of the MOD. |

[12] Environmental and economic issues are detailed in the Options Appraisal V2.0 at https://airspacechange.caa.co.uk/PublicProposalArea?pID=228

## Design Option Conclusion

2.6 The proposed option, “Create dedicated E-7 areas” provides considerable benefit over Option 0 “Do nothing” and Option 1 “Do minimal”[13]. There are negligible economic and environmental costs involved in the introduction of dedicated E-7 areas. There are also several advantages: these include:

Safe ops, whereby the areas are published and hence, it is a known traffic environment;

Operational effectiveness, in terms of maximising the effectiveness of the E-7 Wedgetail sensor;

Flexible use of airspace, by means of E7 ability to alter level within the operating area to accommodate civil traffic flow, as well as the airspace being non-segregated to facilitate flow of other traffic through it;

Potential environmental savings, due to the ability for pre-planned tactical routing of civil traffic, resulting in nil/negligible increase in CO2 emissions.

Whilst there will be some routine tactical coordination required to allow both the MOD and civilian operators to operate safely in the same non-segregated airspace, this is no different to current procedures. Therefore, The Change Sponsor assesses Option 2 has the least impact to other airspace users. Finally, the creation of dedicated E-7 operating areas allows the MOD to position this air system in the optimum geographical location to maximise the effectiveness of its advanced MESA radar ensuring all training, operational and defence tasks are met. **As such, Option 2 is the preferred option of the Change Sponsor.**

## Operating Principles

2.7 **Activation.** The designated E-7 operating area will be notified to 78 Sqn on a day-by-day basis approx. 2 hours prior to aircraft departure (normally by a Military Pre-note/F2919 Flight Plan). This will allow 78 Sqn sufficient time to co-ordinate with the relevant civilian air traffic agency. Whilst the E-7 may have a preferred operating area it also has the flexibility to move to another area/level to accommodate civil traffic flow. As the airspace is non-segregated civil air traffic can route through the E-7 operating area as long as minimum vertical and lateral separation is provided between coordinated aircraft.

2.8 **Frequency of flights.** It is anticipated that the E-7 will fly one sortie per day (Mon to Fri) utilising one or more operating areas. The duration of the flight will be approx. 10 hours, of which 2 hours may be used to transit to/from the area. Additional flights may be required in support of major National/NATO Exercises (3 to 4 Exercises per year of up to 2 weeks duration are predicted) or in support of National Security tasks.

2.9 **Hours of Operation.** The E-7 will normally be tasked to support UK/USAFE Fast Jet training in existing DAs. This routinely occurs during daylight hours but also includes

[13] Further details can be found within the Options Appraisal V2.0 at https://airspacechange.caa.co.uk/PublicProposalArea?pID=228

a less frequent element of night flying. The designated E-7 operating area will be active for up to 8 hours.

2.10 **Free Route Airspace (FRA).** As the proposed E-7 Operating Areas are non-segregated the introduction of FRA should not affect this ACP. FRA operation can continue as it does today through coordination between civil and mil ATCOs.

2.11 **Operating Authority.** HQ 1 Gp is the Operating Authority for the E-7 Wedgetail.

# Section 3 – Effect of Proposed Option

## Habitat, Noise and Environmental Impact

3.1 Section 3 of this document shows the habitat, noise and environmental impacts of the preferred option; **introduction of dedicated E-7 Operating Areas**.

## Habitat Impact

3.2 There are no changes to air traffic patterns or number of movements expected below 3000 ft due to this airspace change proposal. Therefore, iaw CAP 1616i - Habitats Regulations Assessment – Early Screening Criteria the Change Sponsor concludes there is no requirement to assess Habitat impact.

## Noise Impact

3.3 The Department for Transport Air Navigation Guidance 2017 details the Government's altitude-based guidance.

- For all changes to airspace with no impact below 7000 feet the CAA should prioritise the reduction of aircraft CO2 emissions and the minimising of noise is no longer the priority; **The Change Sponsor invites the CAA to agree that this is indeed the case for this ACP.**

## Environmental Impact

3.4 The Air Nav Directions 2023 enable the CAA to disregard the environmental impacts of military aircraft when the proposal has been submitted by, or on behalf of, the MoD. However, the CO2 emissions of civil aircraft re-routing as a consequence of the proposed change must be assessed. A qualitative assessment has already been conducted[14].

## NATS Assessment on Quantitative Modelling

3.5 NATS were engaged with regarding the value of investing in Quantitative Modelling[15]. The NATS Analytics team delivered the following conclusion:

*The view is that it is not possible to accurately assess the environmental impact of E7 airspace and therefore it is an ineffective use of time and effort to perform any such task. The main constraining factors being:*

- *The proposed airspace is not segregated from the network (and so does not affect the pre-tactical or flight planning aspects which would normally be assessed to measure any change to the current baseline)*

[14] See the Options Appraisal (FOA) at https://airspacechange.caa.co.uk/PublicProposalArea?pID=228
[15] Note: Quantitative assessment is no longer required for a Level 3 submission; however, as engagement on the issue had already taken place, the outcome is articulated here.

- *As it is only the aircraft that needs to be deconflicted from GAT, the airspace and aircraft are coordinated on a tactical basis between Mil and Civil ATC as and when required, at a mutually convenient level in the confines of the lateral airspace.*
- *The tactical nature and multiple variables at play here including multiple locations, time of day, required/requested levels, GAT / Network demand and frequency for example, adds significant complexity.*

*It is our view that at best, and if even possible, any analytics would be excessively complex and unreliable to the point that the effort required would be prohibitive and any output would come with a number of caveats that would make it open to challenge.*

*In summary the time, cost and complexity required to produce any data would not be proportionate to the change. Clearly there will be some Operational impact and we look forward to continuing our discussions on this and will, of course, provide formal feedback into the ACP process.*

3.6 The Change Sponsor suggests that in line with the NATS Assessment on Quantitative Modelling and the fact that this ACP has been re-designated as a Level 3 submission, any further effort to calculate any economic impact / impact on fuel burn and $CO_2$ emissions is unlikely to provide any valuable or meaningful measurements and would be disproportionate to the impact itself. **The Change Sponsor proposes quantitative modelling is scoped out of this ACP.**

**Baseline Environmental Data**

3.7 Notwithstanding the statements in paras 3.5 and 3.6 above, the Change Sponsor has produced some baseline data to show a “snapshot” of civilian traffic routing through two of the extant E-3 operating areas on a busy air traffic day (date provided by NATS – 28 Jul 23). This aims to highlight the volume of traffic that may have required lateral or vertical adjustments, with the additional CO2 emissions therein, had an E-3D been operating in the area and not altered its Flight Level. The Change Sponsor endeavours to highlight that civilian traffic density through the areas was low and that any alteration in height or heading to avoid the E-3D would have been negligible with virtually zero additional CO2 emissions from additional fuel burn. Indeed, some or all of the civilian traffic may not have required any alterations at all to their flight plans as deconfliction may have occurred naturally due to the relative geography and heights of the potential conflicting aircraft. The data is therefore considered to be a worst-case scenario.

3.8 The two areas chosen for the baseline data were UK3 (East Anglia) and UK6 (North Sea).

UK3 was chosen as this is in a particularly busy air traffic environment being to the East of London and affecting traffic routing to/from Europe and descending/climbing in/out of London airports.

UK6 was chosen as this is one of the most used E-3D operating areas utilised for controlling fast jet aircraft in the EGD323 Danger Areas in the North Sea. To enable the aircraft to be counted, the Change Sponsor purchased Automatic Dependent Surveillance-Broadcast (ADSB[16]) historical data[17] and ran a program for the 8-hour period 0800Z-1600Z, which represents a typical “on station” time for an E-3D. The data was filtered to include aircraft in the FL260 – FL360 bracket which allows a 1000ft buffer on the actual vertical limits. The Change Sponsor ran the programme at x10 actual speed and counted all the tracks routing through the areas. The results for both areas are shown below:

**UK 3 – 28 Jul 23 0800Z-1600Z (Table 1)**

| Time | Number of Aircraft in Area | Time | Number of Aircraft in Area |
|---|---|---|---|
| 0800-0900 | 1 | 1200-1300 | 4 |
| 0900-1000 | 4 | 1300-1400 | 11 |
| 1000-1100 | 2 | 1400-1500 | 4 |
| 1100-1200 | 1 | 1500-1600 | 6 |

Table 1: Average no. of potential conflicting aircraft per hour in UK 3 - 4.1

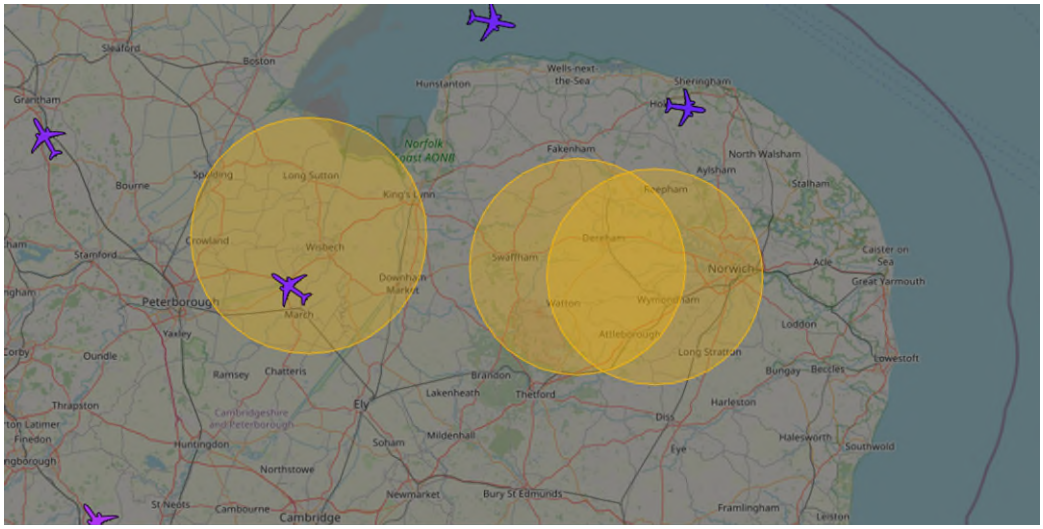


Figure 12 - 0942Z

[16] ADSB data is an aviation surveillance technology allowing aircraft position to be displayed on air traffic radars. This data can be replayed via a computer over any designated area and timeframe allowing individual aircraft to be tracked.

[17] Source: ADSB Exchange

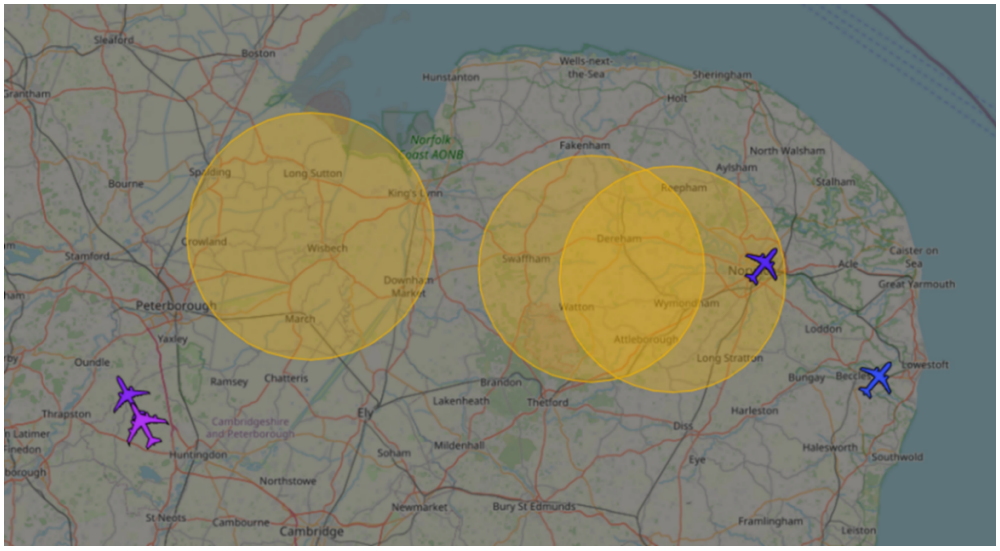


Figure 13 - 1134Z

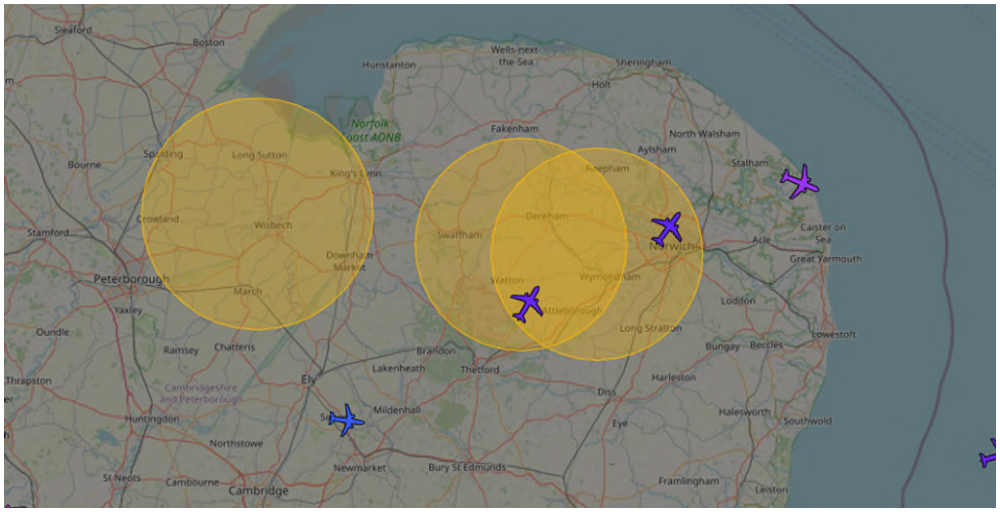


Figure 14 - 1303Z

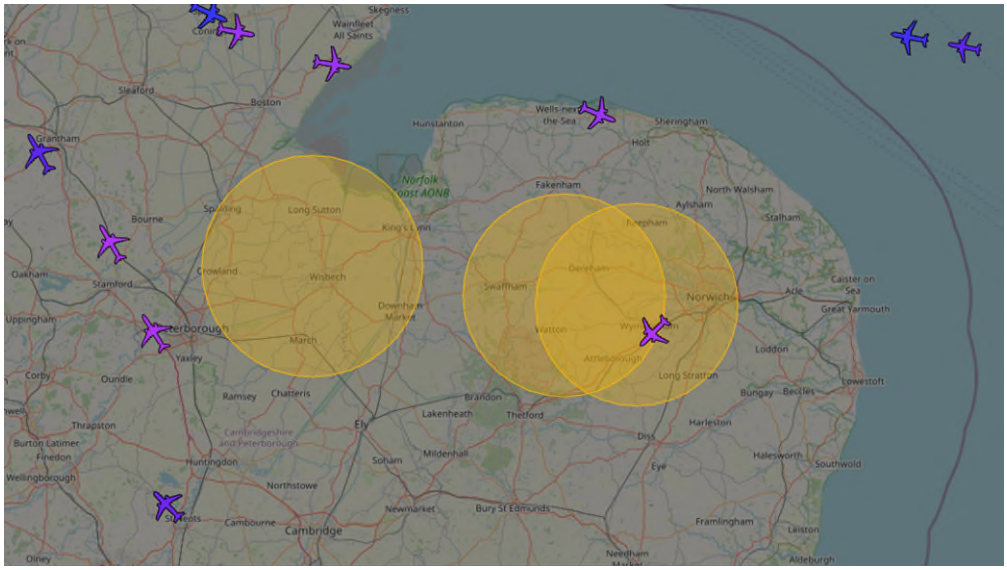

Figure 15 - 1515Z

**UK 6 – 28 Jul 23 0800Z-1600Z (Table 2)**

| Time | Number of Aircraft in Area | Time | Number of Aircraft in Area |
|---|---|---|---|
| 0800-0900 | 5 | 1200-1300 | 6 |
| 0900-1000 | 3 | 1300-1400 | 2 |
| 1000-1100 | 6 | 1400-1500 | 1 |
| 1100-1200 | 9 | 1500-1600 | 2 |

Table 2: Average no. of potential conflicting aircraft per hour in UK 6 - 4.3

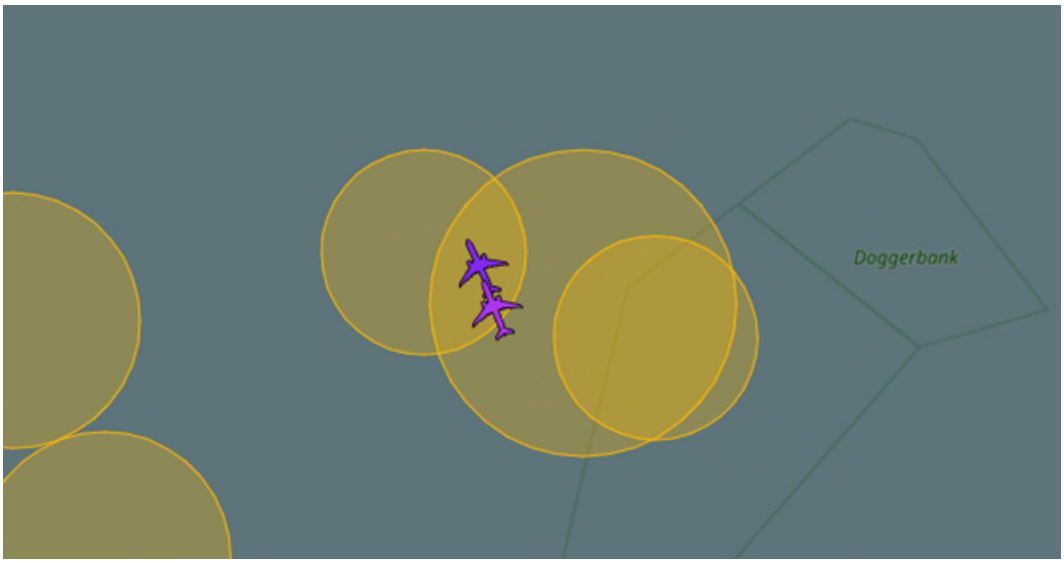


Figure 16 - 0847Z

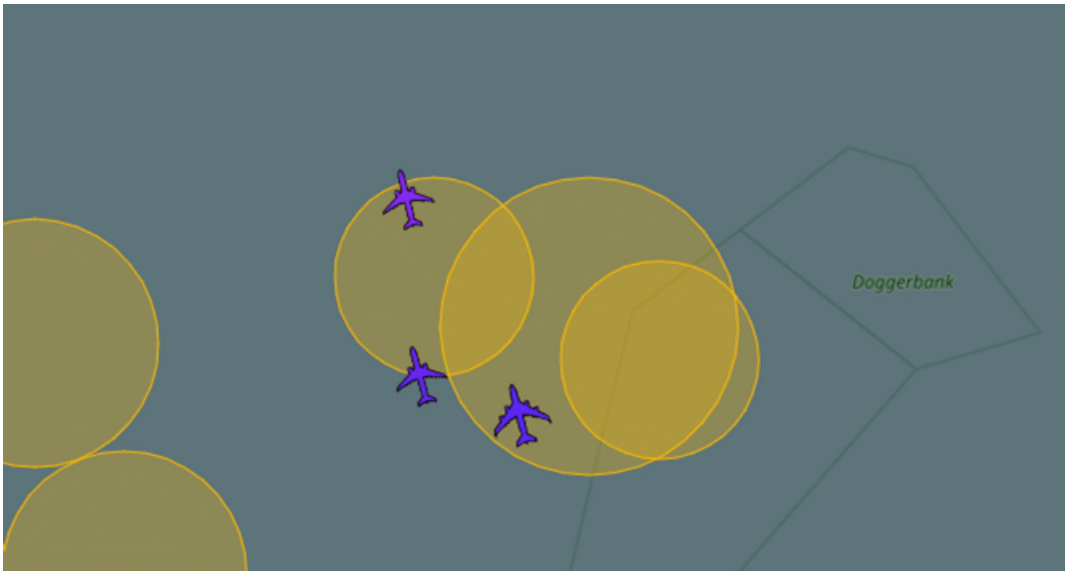


Figure 17 - 1031

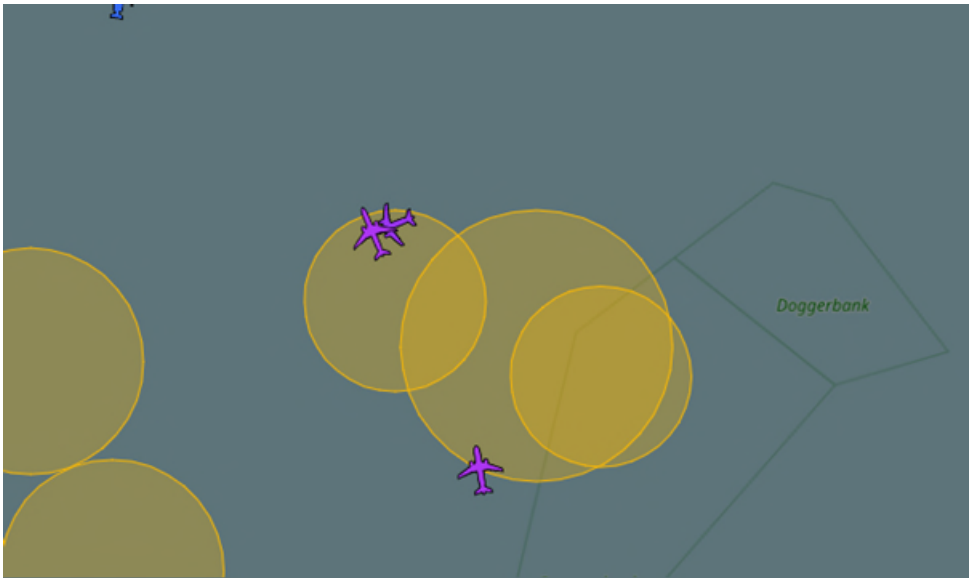


Figure 18 - 1112Z

3.9 The Change Sponsor then ran the same ADSB data for one of the proposed new E-7 Operating Areas in the North Sea (F1) to ascertain the flow density through this airspace as a direct comparison to UK 6. This is likely to be the prime replacement operating area in the North Sea to control traffic in the EG D323 Danger Areas. The results are shown below.

**Proposed F1 area – 28 Jul 23 0800Z-1600Z (Table 3**)

| Time | Number of Aircraft in Area | Time | Number of Aircraft in Area |
|---|---|---|---|
| 0800-0900 | 1 | 1200-1300 | 4 |
| 0900-1000 | 2 | 1300-1400 | 6 |
| 1000-1100 | 7 | 1400-1500 | 7 |
| 1100-1200 | 4 | 1500-1600 | 6 |

Table 3: Average no. of potential conflicting aircraft per hour – 4.6

28 Jul 23 – 0844Z

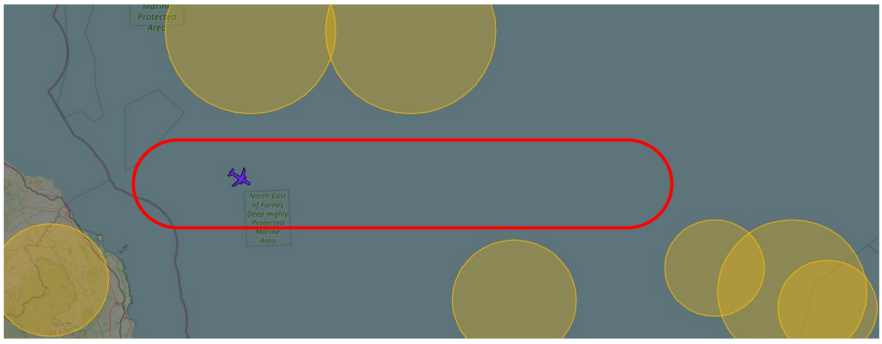

Figure 19 – 0844Z

28 Jul 23– 1056Z

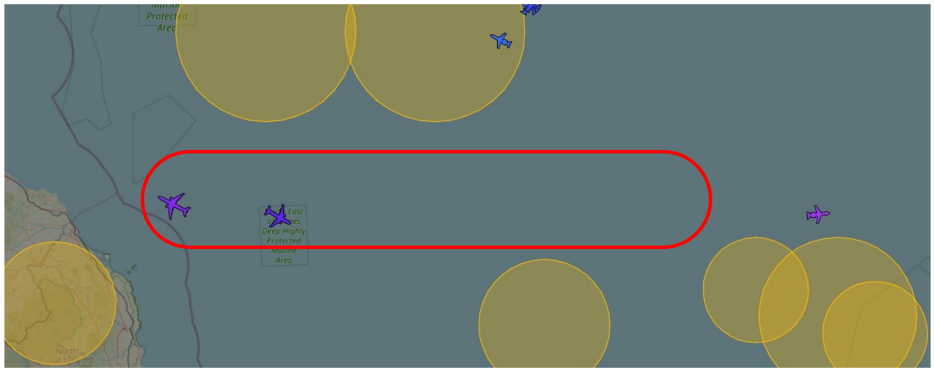

Figure 20 – 1056Z

28 Jul 23– 1255Z

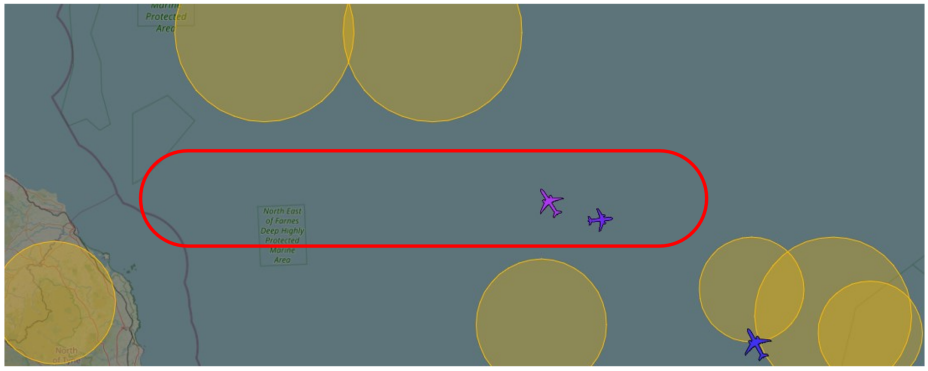

Figure 21 – 1235Z

3.10 The Change Sponsor did not rerun the data for the proposed new Operating Area in East Anglia (H1) as the dimensions of this area are very similar to that of UK3. As such the Change Sponsor decided that a direct read across from the data in Table 1 was also valid for H1.

**Conclusions from ADSB data**

3.11 The data in Tables 1-3 demonstrates that civilian airline traffic routes through the 2 extant E-3D Operating Areas on less than 5 occasions per hour. This is also the case for the 2 proposed new E-7 Operating Areas. Thus the Change Sponsor supports NATS' statement at para 3.4 that any further assessment on Quantitative Modelling is unlikely to provide any valuable or meaningful measurements and would be

disproportionate to the impact itself. Moreover, this data is deemed to be worst case, as the E-7 is able to adjust its operating Flight Level to deconflict with other aircraft (or indeed relocate to another area) if traffic density is particularly high.

**10 Year Forecast**

3.12 The Change Sponsor conducted a 10-year forecast to assess airline growth and the effect it will have on the ACP. The baseline scenario data below from the Eurocontrol Aviation Outlook 2050 report shows growth of +44% between 2019 and 2055 (figure 22). Assuming linear growth between these dates (+1.42% per year) the Change Sponsor assesses growth to be 14.2% over the next 10-year period.

| ECAC | IFR flights | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2019 | | 2050 | | | 2050/2019 | |
| | Total (million) | Avg. daily (thousands) | Total (million) | Avg. daily (thousands) | Extra flights/day (thousands) | Total growth | AAGR |
| *High* scenario | 11.1 | 30.4 | 19.6 | 53.6 | 23.2 | +76% | +1.8% |
| *Base* scenario | | | 16.0 | 43.7 | 13.4 | +44% | +1.2% |
| *Low* scenario | | | 13.2 | 36.2 | 5.8 | +19% | +0.6% |

Figure 22: Airline Growth (Source: Eurocontrol Aviation Outlook 2050 Report)

3.13 Potentially, the average number[18] of civilian airline aircraft transiting the 2 areas is approximately 4 per hour. With a growth rate of +14.2% over 10 years the number of potential airline traffic per hour would increase to approximately 5. Again, it should be noted that the E-7 can alter its operating Flight Level to negate the requirement for civilian airline aircraft to change route/height or can relocate to another area if civilian traffic density is particularly high.

3.14 Thus, the Change Sponsor assesses by comparison, that in the future, with tactical co-ordination by ATC, there would be little or no impact to civilian airline traffic. Therefore, the new E-7 Operating areas will also not generate increases in CO2 emissions over the next 10 years.

[18] Figures are rounded to nearest whole number for practical reflection of number of aircraft

## Section 4 – Targeted Engagement Process

### Engagement Duration

4.1 The Change Sponsor proposes to conduct a 6-week targeted engagement process commencing on 3 June 2024, finishing on 14 July 2024. This is to ensure all stakeholders who wish to provide feedback have sufficient time to do so. A reminder will be sent 2 weeks prior to the close of the engagement, if necessary, on 1 July 2024.

### Purpose

4.2 The purpose of this engagement period is to provide an opportunity for all stakeholders to comment on the proposed airspace design option. All feedback will be collated and analysed by the Change Sponsor and will help to shape the final proposal to be submitted to the CAA.

4.3 The key themes that the Change Sponsor is seeking to answer through engagement include, but are not limited to, the following:

- The perceived effect of this proposal (positive or negative).
- Key concerns for stakeholders.
- Mitigating factors that could be employed to minimise impact.

### How to respond

4.4 This engagement will be undertaken through electronic communication. Stakeholders will be contacted by email and requested to respond to the Change Sponsor directly by email. Should face to face engagement be requested then the Change Sponsor will arrange an online video call via MS Teams.

4.5 Should stakeholders wish; they can submit a written response. On receipt, it will be uploaded the CAA portal. Postal address:

- Letter FAO: [redacted]
  ISTAR FHQ
  Atlantic Building
  RAF Lossiemouth
  Lossiemouth
  Moray
  IV31 6SD

4.6 Engagement responses are via email (please send to both addresses) to the Project Lead:

- Email: [redacted] Air-1Gp-ISTAR-E7Wegetail@mod.gov.uk

**Next Steps**

4.7 Engagement responses will be collated and assessed throughout the engagement period. Once the engagement period has closed, the Change Sponsor will analyse and categorise all feedback for an engagement report. The report will be published, articulating all issues raised and how they have been resolved. The report will also confirm the option to be submitted to the CAA and/or any additional amendments to be made to the chosen design as a result of engagement feedback. The Change Sponsor will upload the document to the Portal once the CAA has confirmed that no further engagement is required.

4.8 Timeline of steps and gateways:

| Stage/Step | Description | Gateway Date |
|---|---|---|
| 3 | Targeted Engagement Launch | 3 June 2024 |
| 3 | Reminder to Stakeholders | 1 July 2024 |
| 3 | Collate and review responses from targeted engagement. | 14 July 2024 |
| 4 | Produce submission | September 2024 |
| 4 | Submit Airspace Proposal to the CAA | October 2024 |
| 5 | Decide | January 2025 |
| 6 | Implement into AIRAC | May 2025 |

4.9 The Change Sponsor will continue the ACP process in accordance with the timeline agreed, submitting all required documentation at Stage 4 in order to allow the CAA to reach a decision in January 2025.