ACP-2020-024

E-7 Wedgetail Operating Areas

STAGE 4

FINAL SUBMISSION

V1.0

Ministry of Defence

Responsible Authors of this Document

The Change Sponsor for this Airspace Change Proposal is the Ministry of Defence (MoD). The project team is drawn from the ISTAR FHQ.

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Only responsible authors may implement amendments via the Project lead. All revisions will be listed and detailed in the table below.

Revision Number	Affected part	Revised By	Notes
Initial Issue V1.0		Project Lead	

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References

Reference Material. The table below details all documents that will be referenced throughout this document. This includes previous material submitted as part of this Airspace Change Proposal.

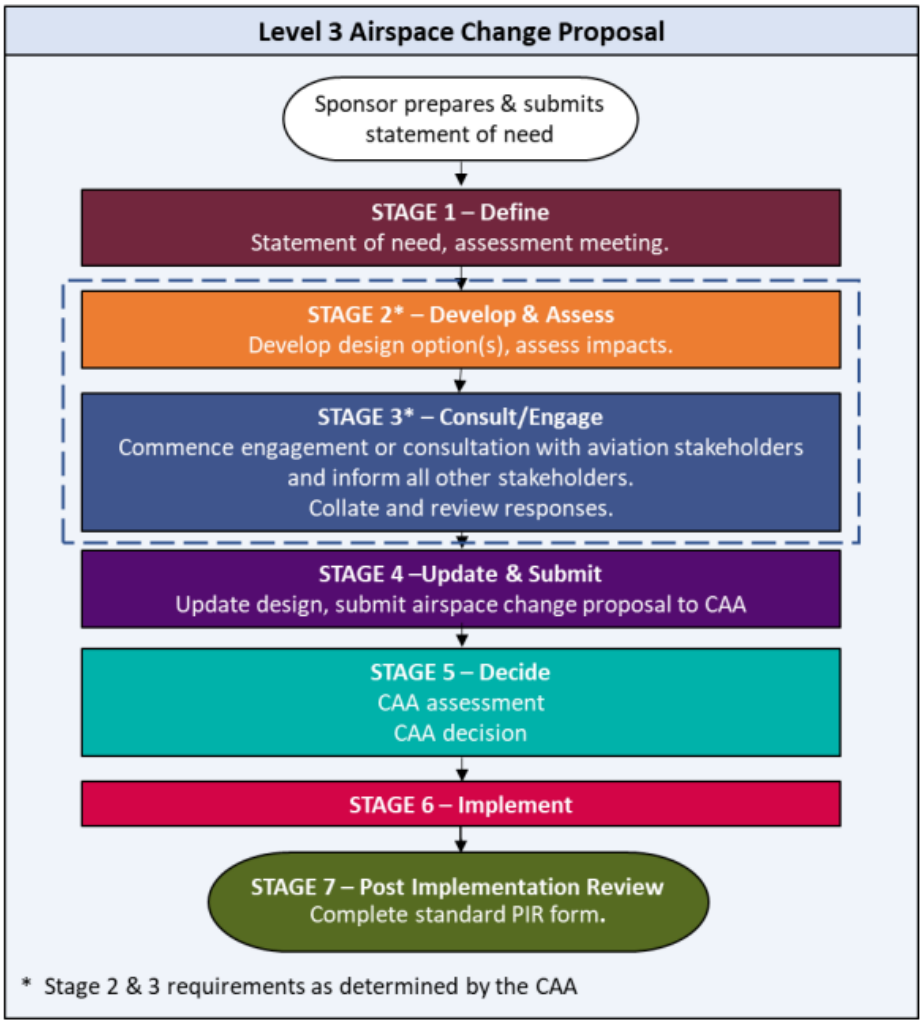
Ref No	Title / Hyperlink
1	Stage 1: Statement of Need
2	Stage 1: Design Principles V1.0
3	Stage 2: Design Principles Evaluation V2.1
4	Stage 2: Options Appraisal V2.0
5	Stage 3: Engagement Strategy
6	Stage 3: Engagement Document
7	Stage 3: Full Options Appraisal V1.0

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	Aircraft Proximity
ALARP	As Low As Reasonably Practicable
ANSP	Air 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
LOA	Letter of Agreement
MAA	Military Aviation Authority
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
RVSM	Reduced Vertical Separation Minimum
SA	Situational Awareness
SoN	Statement of Need
Sqn	Squadron
TCAS	Traffic Alert and Collision Avoidance System
TMA	Terminal Control Area
TRA(G)	Temporary Reserved Area (Gliding)
UIR	Upper Flight Information Region
USAFE	United States Air Force in Europe

Introduction

This document meets the Stage 4 requirement of the Civil Aviation Publication (CAP 1616h[1]) Airspace Change Proposal (ACP) for ACP-2020-024, which aims to generate new E-7 Wedgetail Operating Areas within the London and Scottish UIRs. These areas will enable the E-7 Wedgetail to operate safely within the UK in optimal locations to conduct its defence tasks whilst also minimising impact on civilian airline and general aviation traffic.



This Airspace Change Proposal (ACP-2020-024) was initially categorised as a Level 2C submission however in December 2023, the Change Sponsor was informed the Civil Aviation Authority (CAA) had reallocated it from a Level 2c to a Level 3 (low impact ACP)[2]. As of 2 January 2024, the ACP followed guidance set out in CAP 1616 Version 5[3]

[1] CAP1616H: Guidance on APP process for Level 3 and Pre-Scaled ACPs (caa.co.uk)
[2] Email dated 12/12/2023: ACP-2020-024 E-7 Wedgetail Airborne Early Warning Mk1 Orbit Areas Change - CAP1616 V5 Transition Arrangements
[3] CAP1616F: Guidance on the Permanent Airspace Change Process (caa.co.uk)

1 Aims of the Proposal

1.1 As outlined in the Statement of Need (SON) at Reference 1, the Ministry of Defence (MOD) is seeking to secure Non-Segregated Airspace in the form of 21 x E-7 Operating Areas within the London and Scottish Upper Information Region (UIRs), for use by the E-7 Wedgetail.

1.2 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 North Atlantic Treaty Organisation (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.

2 Assumptions and Constraints

2.1 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-3 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 Air Traffic Control (ATC). The areas are intended to be tactically controlled by ATC.

2.2 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.

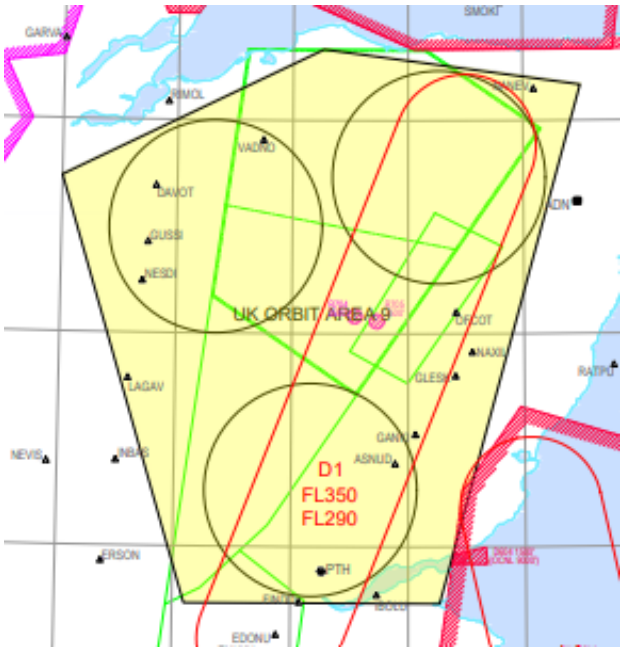
- The airspace will define the scope of the area where the E-7 has non-deviating status, which is similar to how the E-3D operated.

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

2.3 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.

3. Summary of Current Airspace and Operation

3.1 The current E-3 operating areas are spread across the London and Scottish UIRs to enable airborne surveillance of UK airspace. During peacetime this is primarily utilised to provide control of UK and United States Air Forces in Europe (USAFE) jets undergoing training serials but also ensures extended radar coverage to detect hostile aircraft and control friendly aircraft during a threat/conflict period. Within each of the operating areas there are a number of circular lobes which the E-3 aircraft establishes itself on (normally 15NM radius). The areas are in Class C airspace, are non-segregated to ensure the most efficient use of airspace and are in the height band FL 270 – FL350. The E-3 will remain on its lobe/lobes within a specified area at an approved height unless ATC clearance is obtained to change height or move to a different area. An example of one of the current areas is shown below.



The area in yellow depicts UK Orbit Area 9 within which there are 3 circular lobes.

4. Summary of the changes to Airspace Design and operation

4.1 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. The proposed operating areas are intended to ensure a minimal impact on civilian air traffic routings throughout the London and Scottish UIRs and were positioned following liaison with NATS who were identified as the major stakeholder at Stage 1 of the ACP.

- The proposed areas will be managed in the same way that existing E-3 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.

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).

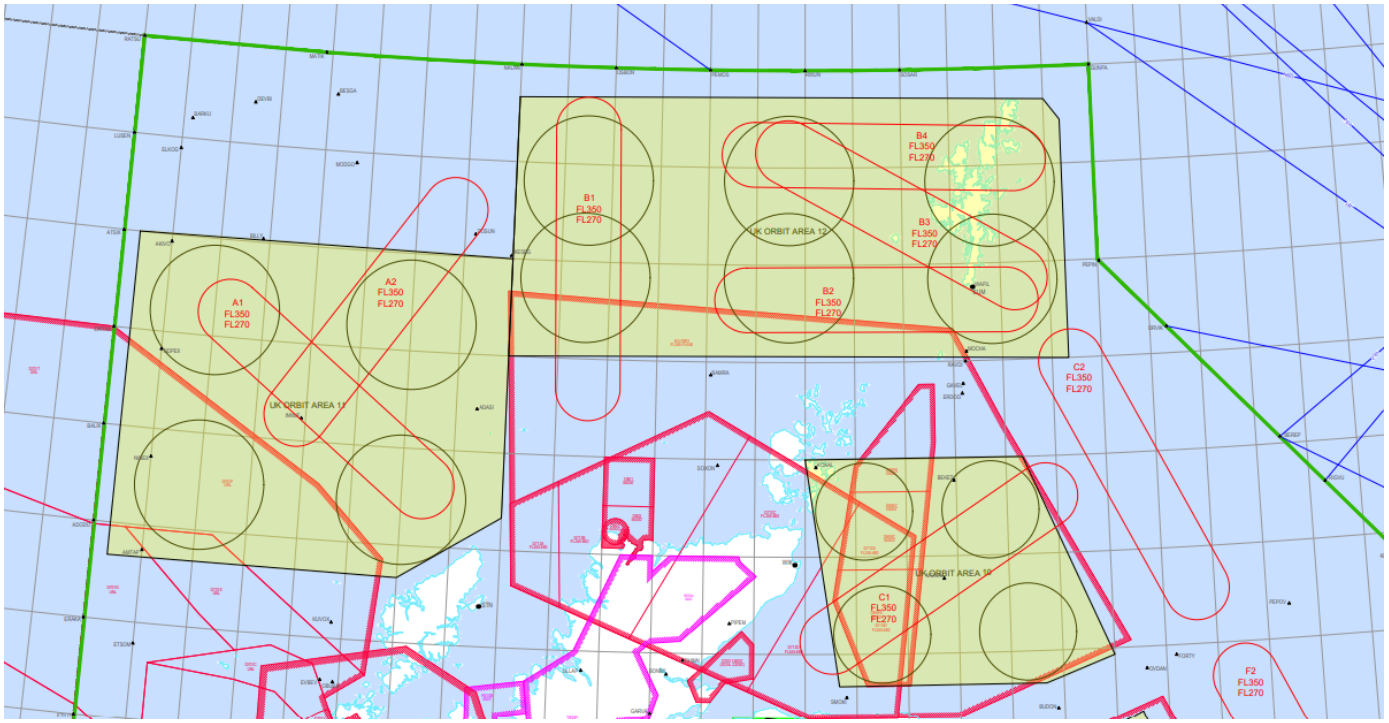


Figure 1 – Proposed E-7 Operating Areas North UK (red racetracks)

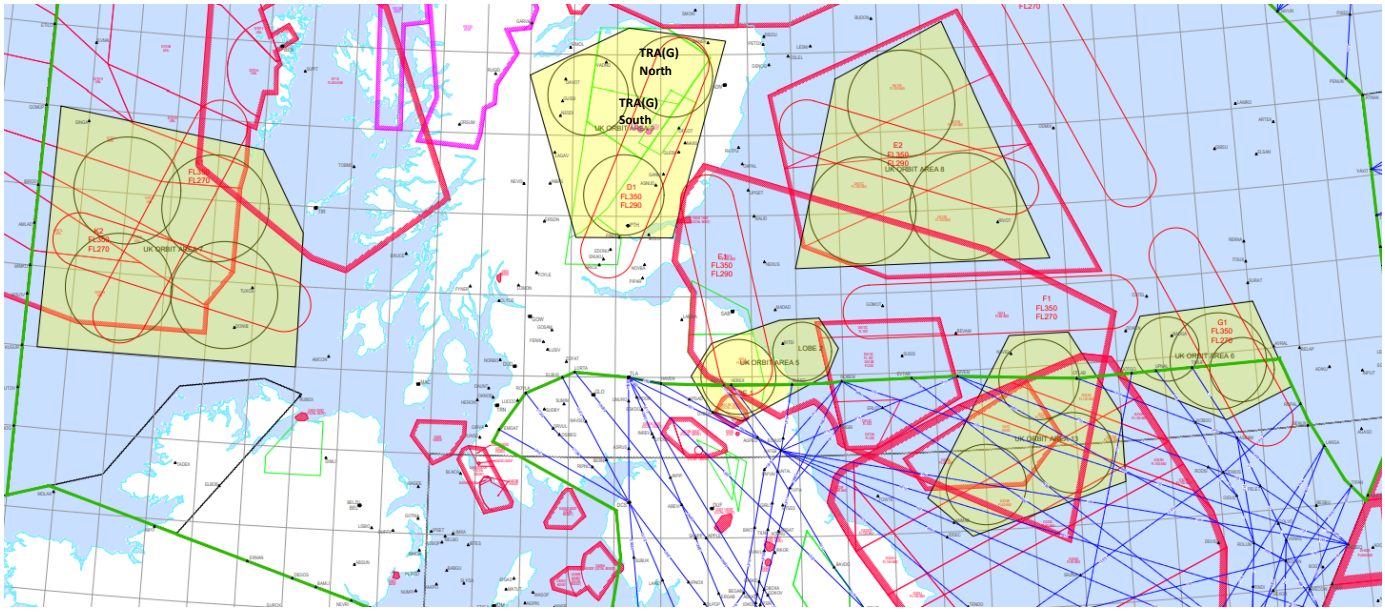


Figure 2 – Proposed E-7 Operating Areas Central UK (red racetracks)

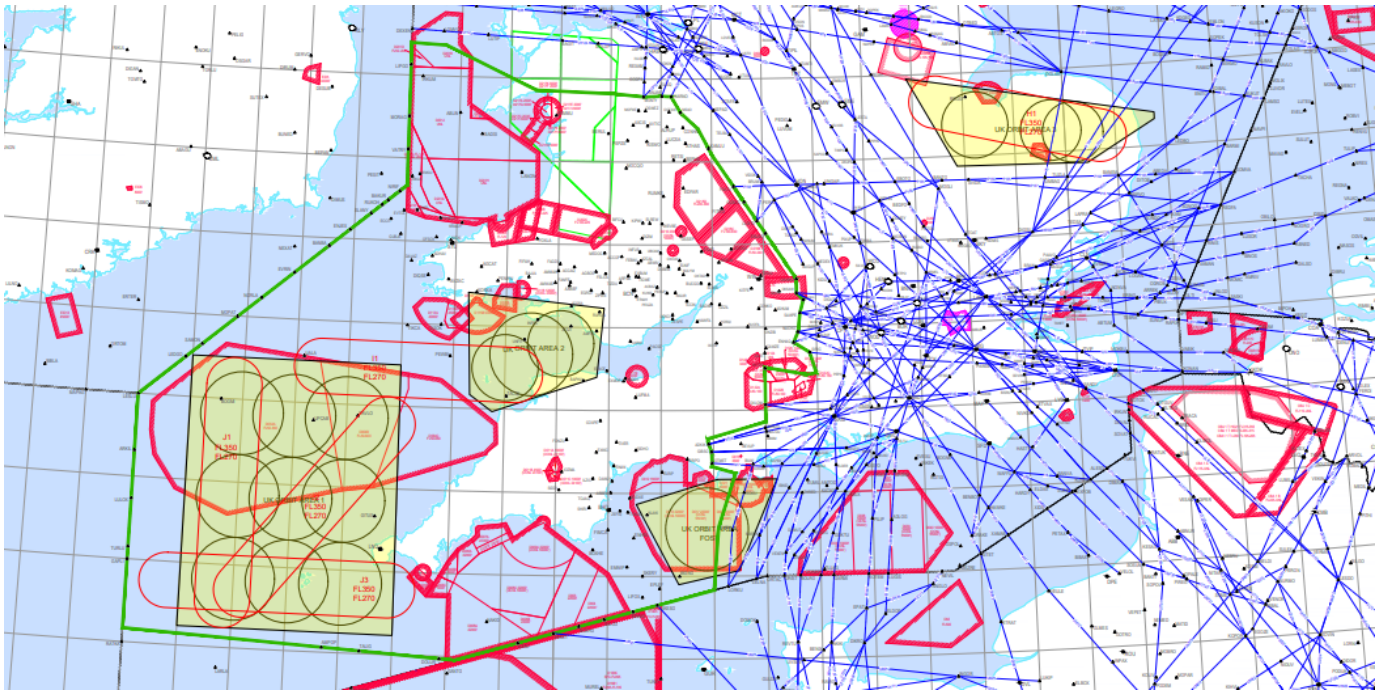


Figure 3 – Proposed E-7 Operating Areas South UK (red racetracks)

5. Options Analysis

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

- The baseline/'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 MESA radar.

- The "do minimal option" (Option 1) which was to operate in existing DAs and modified E-3 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[4].

Summary of Option 0 Full Appraisal[5]

5.2 Option 0, the do-nothing option, aimed to examine whether alternatives existed which would still allow the RAF Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR) force to conduct their training and operational tasks in

[4] 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

[5] Full Options Appraisal is at Ref 7

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 ISTAR force. Finally, evaluating this option against the 9 Design Principles[6] 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

5.3 Option 1, the do minimum option, aimed to examine whether alternatives existed which would still allow the RAF ISTAR force to conduct their training and operational tasks in accordance with the SoN. The ability to continue to operate in modified E-3 areas/DAs 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 ISTAR 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[7] 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.

- 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

5.4 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 ISTAR force to conduct their training and operational tasks in

[6] See Reference 2

[7] See Reference 3

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[8]. 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	Baseline/ 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 Air Traffic Services (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 Airborne Early Warning (AEW) operating areas. This option meets all the Design Principles (DPs), enhances safety, reduces complexity, maintains the predictable traffic environment, and meets the operational requirements of the MOD.

6. Summary of Targeted Engagement

6.1 Targeted engagement was conducted in accordance with the Engagement Strategy[9]. 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 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 released airspace in each of the 4 corners where the E-7 could

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

[9] See Ref 5

never operate[10]. 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[11] 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 Control 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).

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

6.3 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 Temporary Reserved Area (Gliding) (TRA(G)) South above FL240. The Upper Limit of TRA(G) South is Unlimited. Tactical coordination with ATC will resolve this conflict on a daily basis on the few occasions gliding occurs above FL290 (base of D1).

6.4 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 June 2025.

6.5 Stage 3 Targeted Engagement with the MOD, NATS and the BGA commenced in June 2024 and concluded on 31 July 2024. As a result of productive ongoing communications throughout the Stage 3 process the Sponsor was pleased that no major issues or areas of concern were raised in the engagement responses. The responses are as follows:

MOD

‘Defence Airspace and Air Traffic Management (DAATM) have engaged across Defence as requested and can confirm that the ACP is fully supported and there are no further issues or comments from across MOD’.

[10] Note: The E-7 will fly a straight line within the racetrack and tear drop towards each end. It will not fly around the perimeter of the racetrack.

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

NATS

- The agreed level for E-7 operations will likely depend on multiple factors including, for example, time of day flows of civil air traffic. Whilst the engagement paper notes the ability to negotiate the area and level of operations by E-7 aircraft, this will need further development and inclusion in any required Letter of Agreement (LOA) and ATC procedures.
- Previous engagement presented that there are no increased separation requirements for operating E-7 aircraft, and that the aircraft is Reduced Vertical Separation Minimum (RVSM) compliant. Our response is based on this i.e. 1000ft vertical separation. Confirmation of separation required from the aircraft is required to validate our assumptions. If this is not the case, then further development may be required.
- The position of some areas requires international letters of agreement for ATC procedures to be created or updated. At this time we don't anticipate any issues to follow.
- Similarly, letter of agreements and procedures with the gliding community may be required to be updated.
- Previous engagement indicated there may be a requirement to change the flight profile of the E-7 within an operating area (race track and figure of eight). Clarity of flight profiles within the orbit areas will be required to develop procedures for agreeing the E-7 operating level. Some civil sectors are more sensitive to Right-Hand or Left-Hand orbits or figure of 8 orbits so NATS would like to be able to discuss this further so that procedures can be developed. For example, could NATS operations make a request for direction of orbits in conjunction with the operating levels.
- Some areas may have constrained surveillance and comms cover; this will need to be considered in operational agreements.
- There is a general consideration to be made regarding the cumulative effect of multiple, simultaneous activations of operating areas and other special use airspace (Danger Areas, Air refuelling areas etc). The squeezing of civil traffic and associated workload changes must be considered. There may be some areas that would benefit from more robust airspace management protocols and notification procedures (i.e. pre-tactical notification at D-1). F1 area and the D323 and D613 complexes and C1 and D712 for example.
- Should the CAA approve the implementation of the proposed operating areas for E-7, there will be a requirement to complete ATC assurance work. Any hazards or issues identified during this process would be notified to the MOD so that any mitigation or solutions can be put in place.

BGA

I have reviewed the Stage 3 Engagement doc v2.0[12]. As previously discussed, it is only racetrack D1 that is of some concern to the BGA as it is partially co-located with the Scottish TRA(G) complex. I note the text of para 1.8 and this is sensible and reasonable - in theory at least. My concern would be that "on the day" - the day being the very rare day when extremely high glider flights are possible - an air traffic controller might award a presumption of priority to the MoD and decline to allow gliders access to the TRA(G) above FL270 or 280 (buffer for FL290). I would

[12] See Ref 6

therefore request that within the AIP notification of this area (D1) or wherever is appropriate, that there is a written presumption of priority for gliders, with the obvious caveats for emergencies or matters of national security.

6.6 The engagement summary report (iaw CAP 1616h) addresses the points raised above and can be found at Annex A to this document. The Final Options Appraisal at Para 16 also captures points raised by the targeted stakeholders.

7. Summary of anticipated Impacts

7.1 Proposed operating areas are intended to ensure 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.

8. Timeline for Implementation

8.1 The Sponsor will compile the final documents for submission in November 2024. This is to comply with the timeline agreed with the CAA for them to reach a decision in March 2025.

Stage/Step	Description	Gateway Date
4	Submit Airspace Proposal to the CAA	November 2024
5	DECIDE	March 2025
6	IMPLEMENT into AIRAC	June 2025

9. Detailed description of the current airspace and operations

9.1 The current E-3 operating areas have lateral and vertical boundaries, in which there are a series of lobes (generally 15NM radius) on which the E-3 establishes a circular orbit, or when tactical requirements demand it, 2 lobes are used to facilitate a “racetrack” or “figure 8” flight pattern. The areas are non-segregated to ensure the most efficient use of airspace possible. The areas are strategically located around the UK to enable both training with Fast Jets, predominantly in the North Sea (D323 complex), and provide optimum locations for national defence and security tasks. These operating areas are also used by the NATO E-3 Force. The operating areas are activated by Swanwick Military ATC (78 Sqn) on the day of use by a Military pre-note (Military flight plan) that is submitted approximately 2 hours prior to Estimated Time of Departure (ETD). A single Flight Level (FL) is also requested. As the airspace is non-segregated, civil traffic is able to route through the area with 78 Sqn and the Civil sector ATC providing tactical coordination. The E-3 will remain in the area at the Flight Level (FL) (normally FL310) for the duration of the task. Any change of FL or change of area is requested by the crew through 78 Sqn and will not be implemented until coordinated by both 78 Sqn and the Civil sector ATC. Only one area is routinely active at any one time. The E-3 operating areas are typically used on average 3 days a week (8-hour duration) and at weekends by exception.

9.2 The extant and proposed operating areas are all in Class C airspace. This comprises of Upper Air Routes and Free Route Airspace where GAT file flight plans. The E-3 operating areas are strategically located, wherever possible, between the Upper Air Routes. The E-3 operating areas pre-date FRA so some conflictions occur; this should be addressed with the new E-7 operating areas. The airspace is used by both civilian and military aircraft with coordination and separation provided by civilian and military air traffic controllers. The airspace also has numerous military Danger Areas (DA), some of which are permanently active and others which become active for specific timeframes. Both civilian and military aircraft must remain clear of the active DA unless they are tasked to operate within them. There are also several other types of restricted areas in Class C airspace, notably the TRA (G) in Scotland that overlaps one of the current E-3 operating areas (UK-9). An LoA exists between the BGA and military/civilian air traffic control about how and when this is activated. This ensures all relevant airspace users are aware of gliders in the Upper Air and can avoid/coordinate accordingly. Airspace usage across the UK, and further afield, can be accessed via several online websites. The Change Sponsor has used historical Automatic Dependent Surveillance-Broadcast (ADSB) information to provide baseline data on 2 of the current E-3 areas (worst case and most used) which can be viewed in Para 15. In summary, the E-3 operating areas are pre-planned, pre-booked areas in Class C airspace.

10. Detailed description of the Changes to Airspace Design and Operation

10.1 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

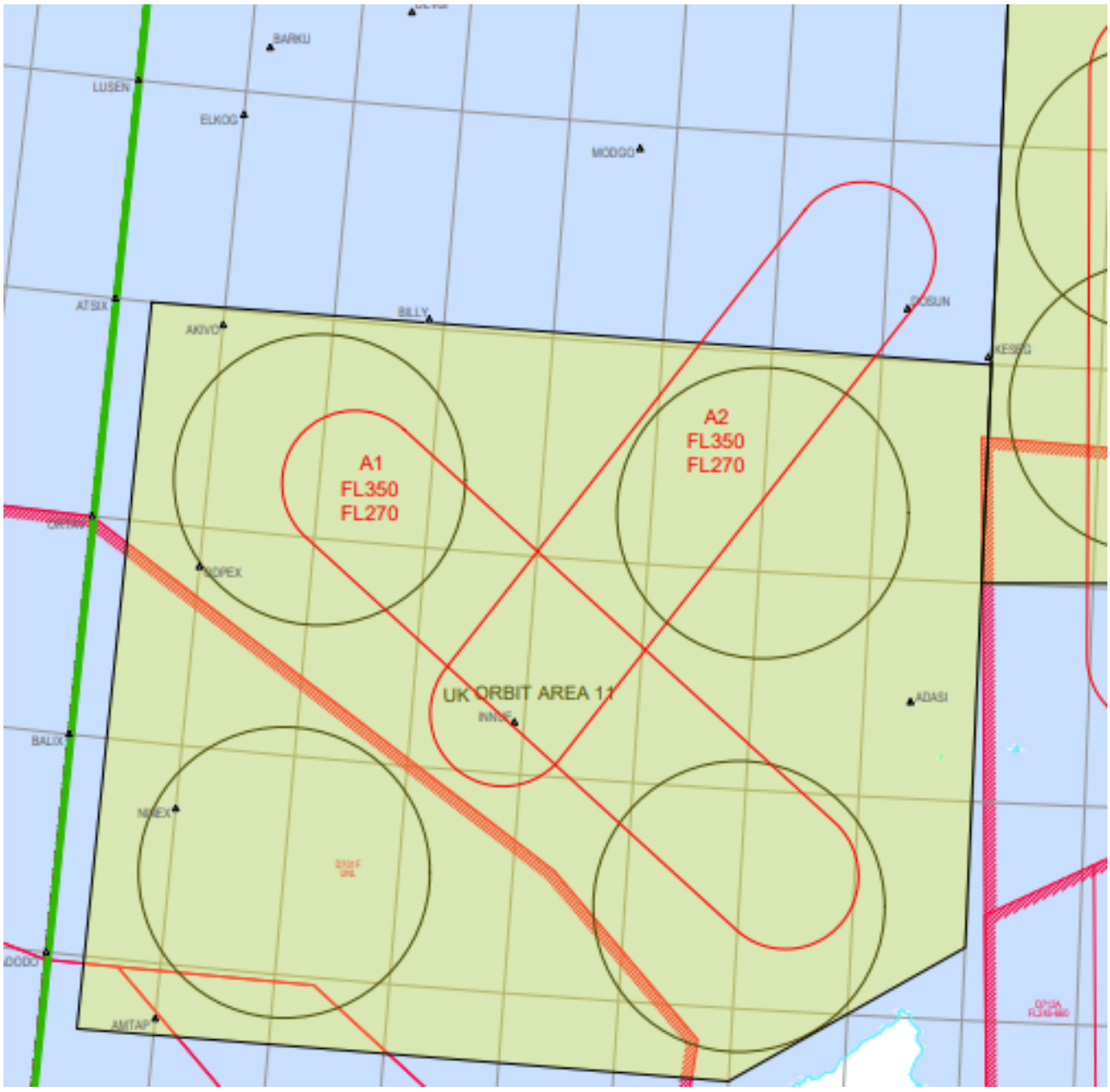


Figure 4 – A1 and A2 Outer Hebrides

- 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

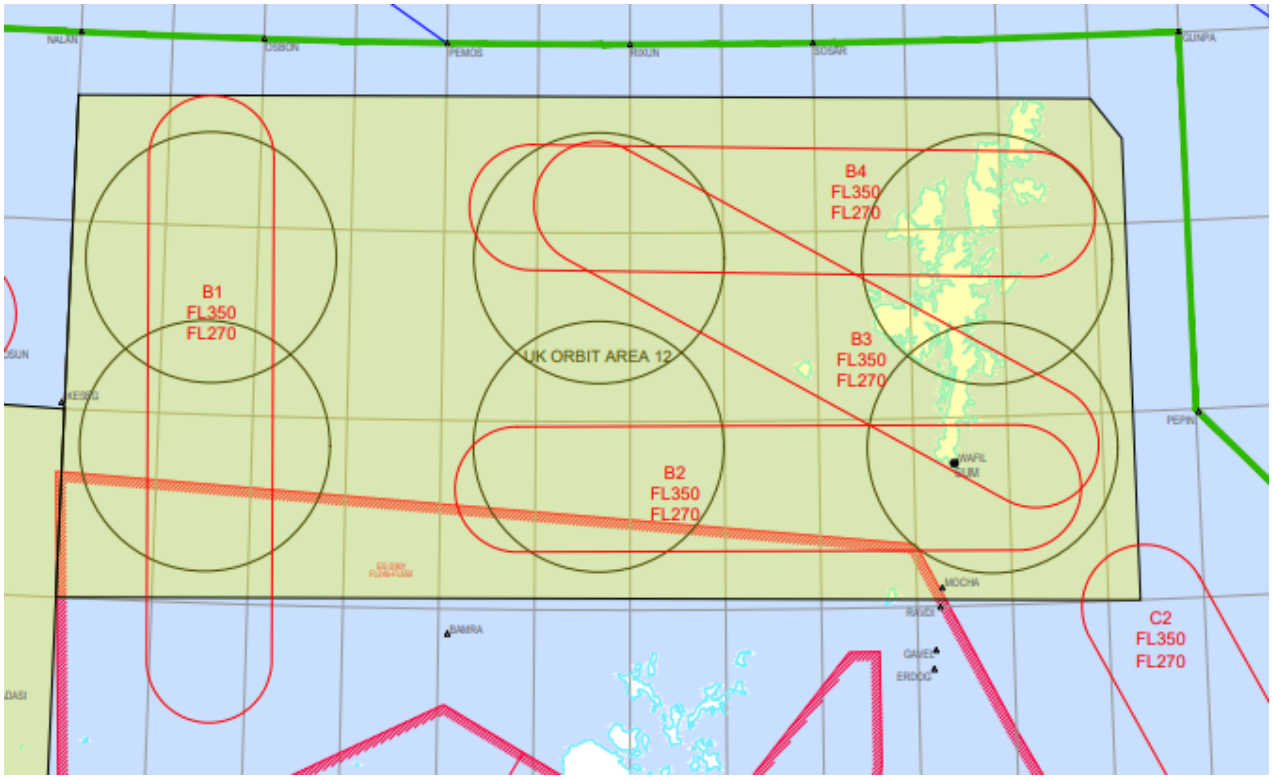


Figure 5 – B1 to B4 North Cape and Shetlands

- 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

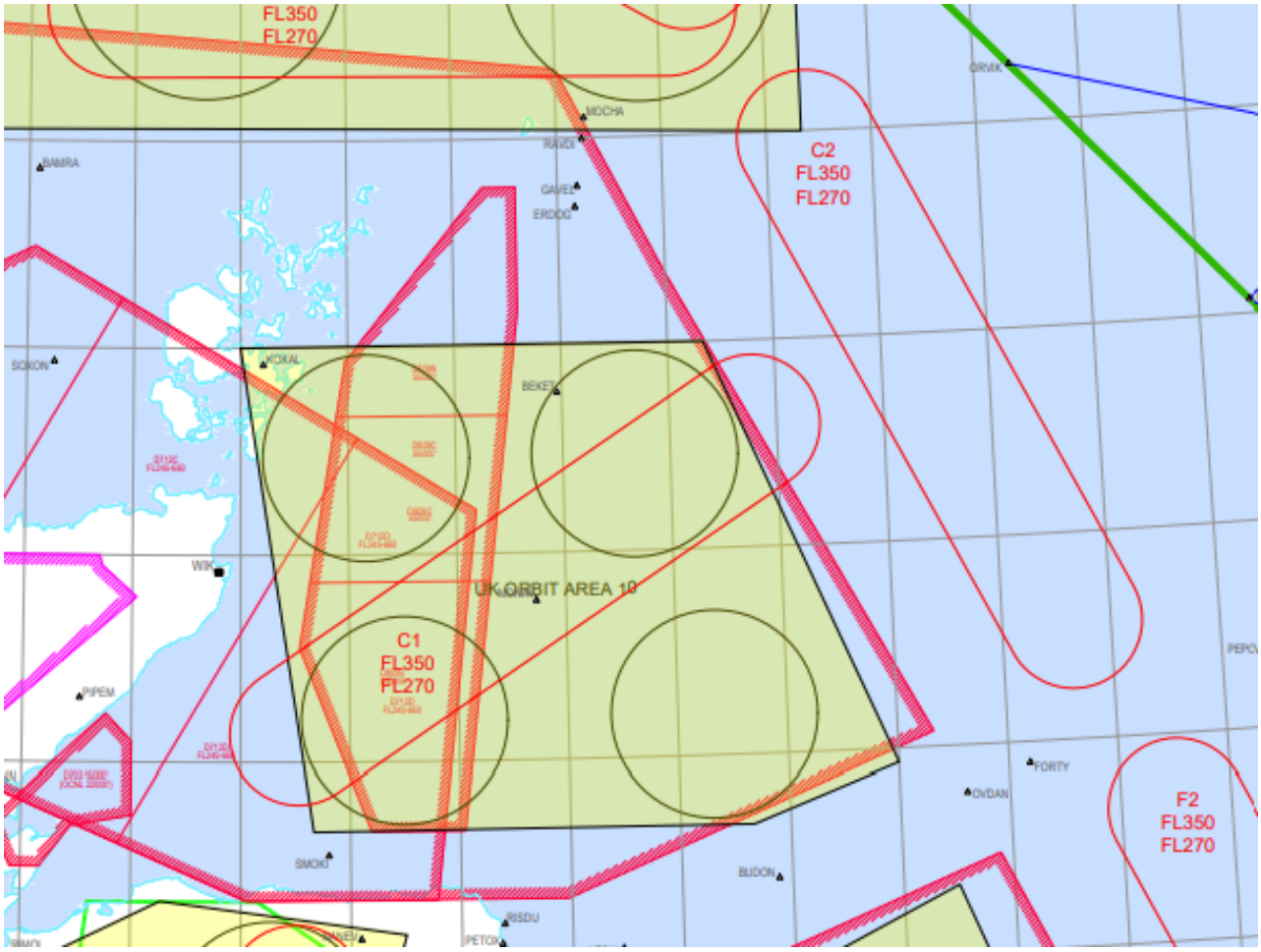


Figure 6 – C1 and C2 Moray Firth

- 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

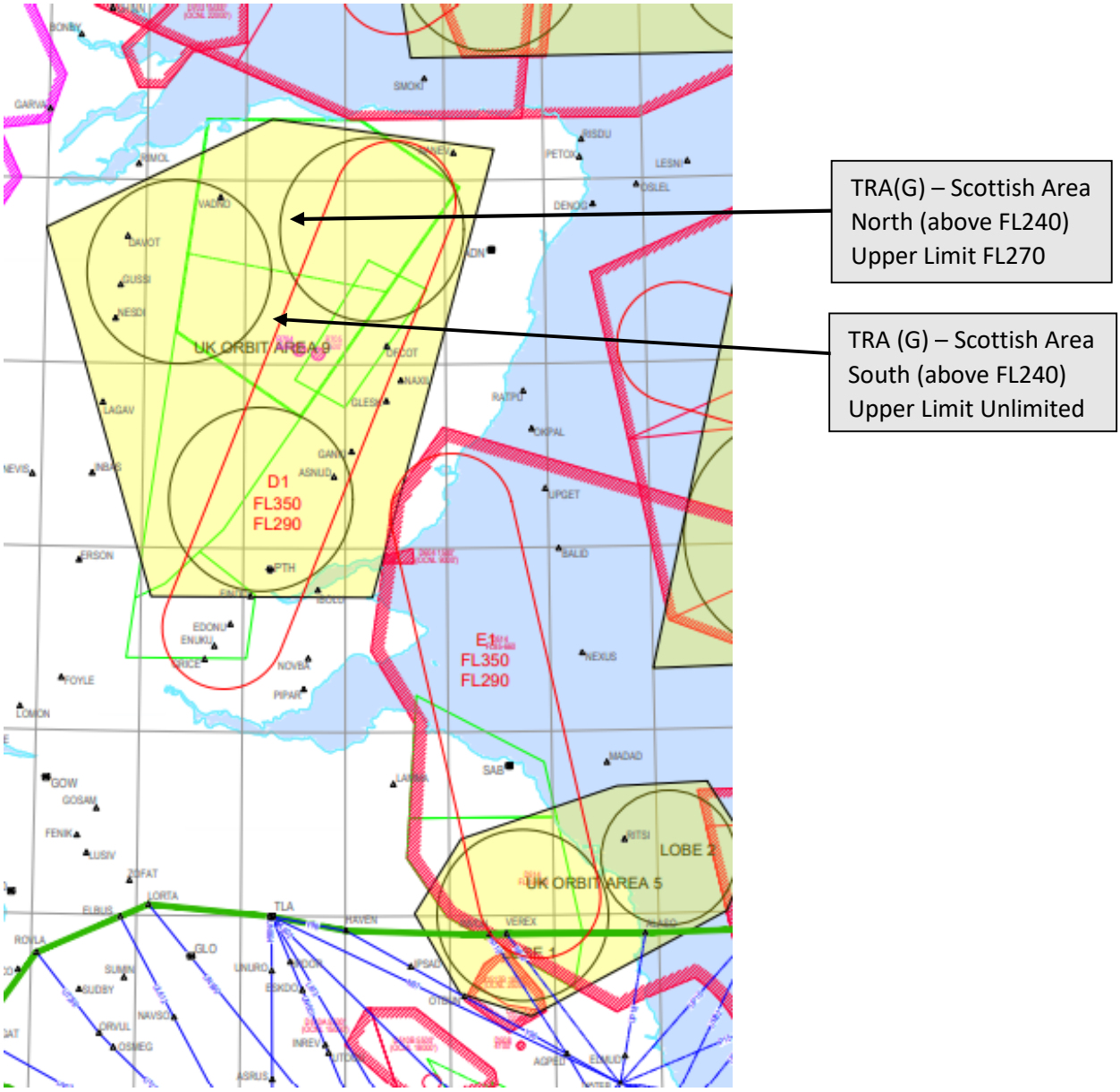


Figure 7 – D1 Scottish Highlands and E1 East Coast

- 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. TRA(G) South conflicts with D1. Tactical co-ordination with ATC as per extant operations in UK-9. Letter of Agreement (LoA) 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) South is active (Upper Limit Unlimited). Activation is by NOTAM.

East Coast

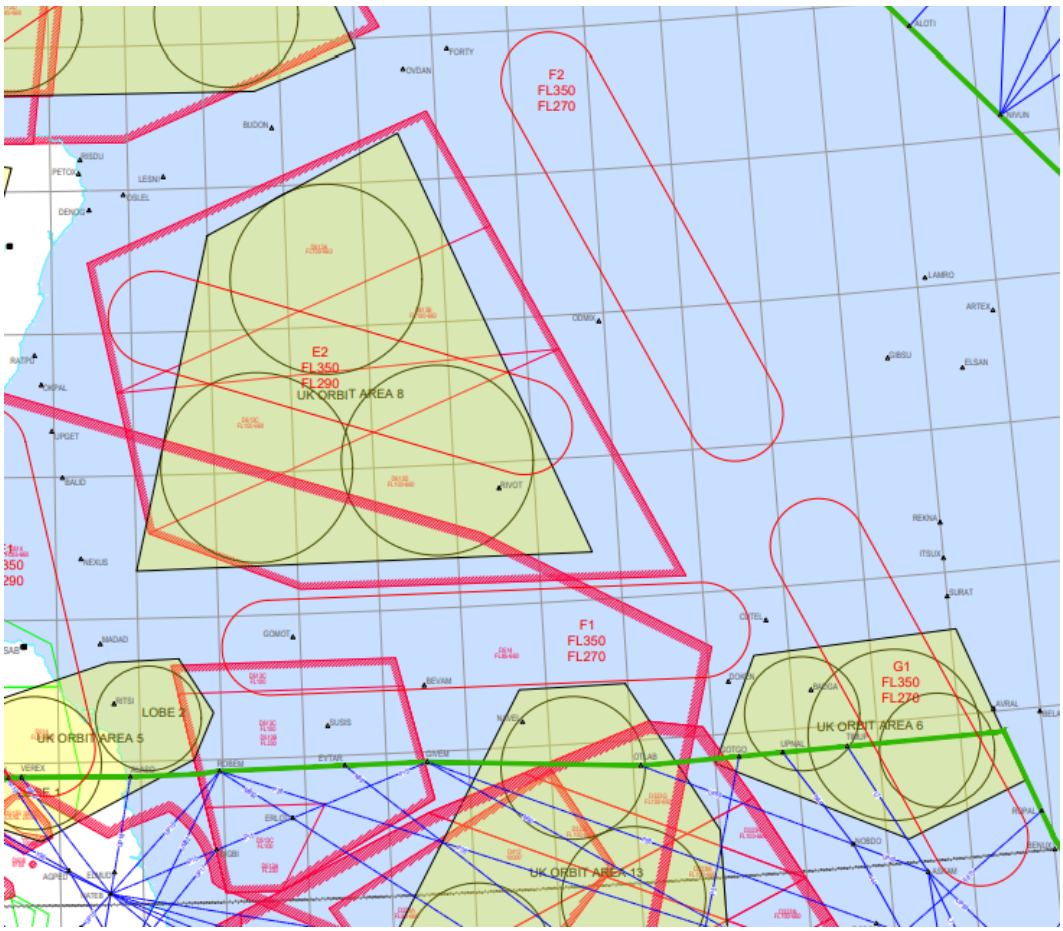


Figure 8 – E2 East Coast, F1, F2 and G1 North Sea

East Coast

- 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

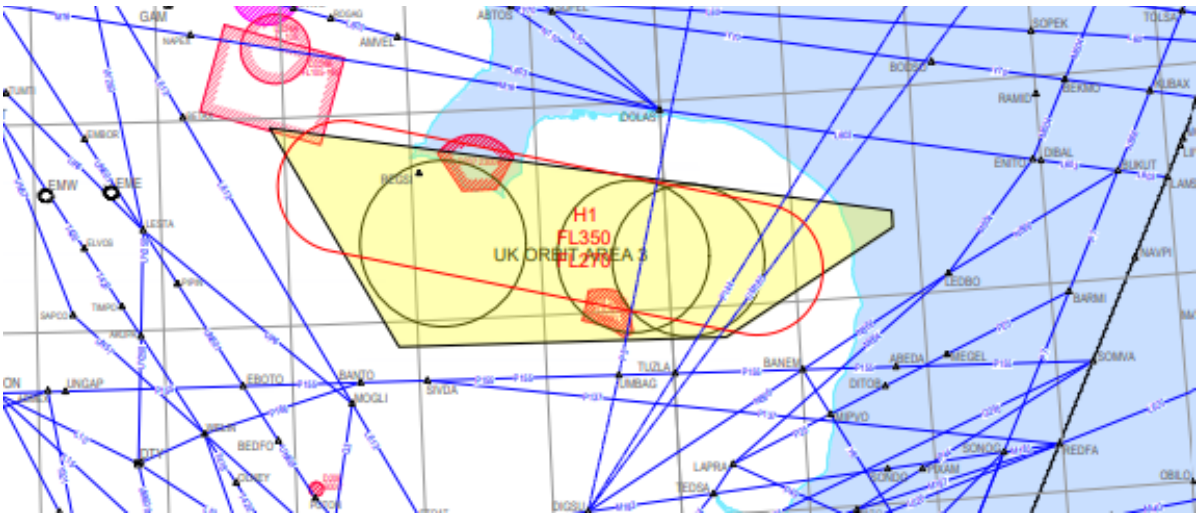


Figure 9 – H1 East Anglia

- 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

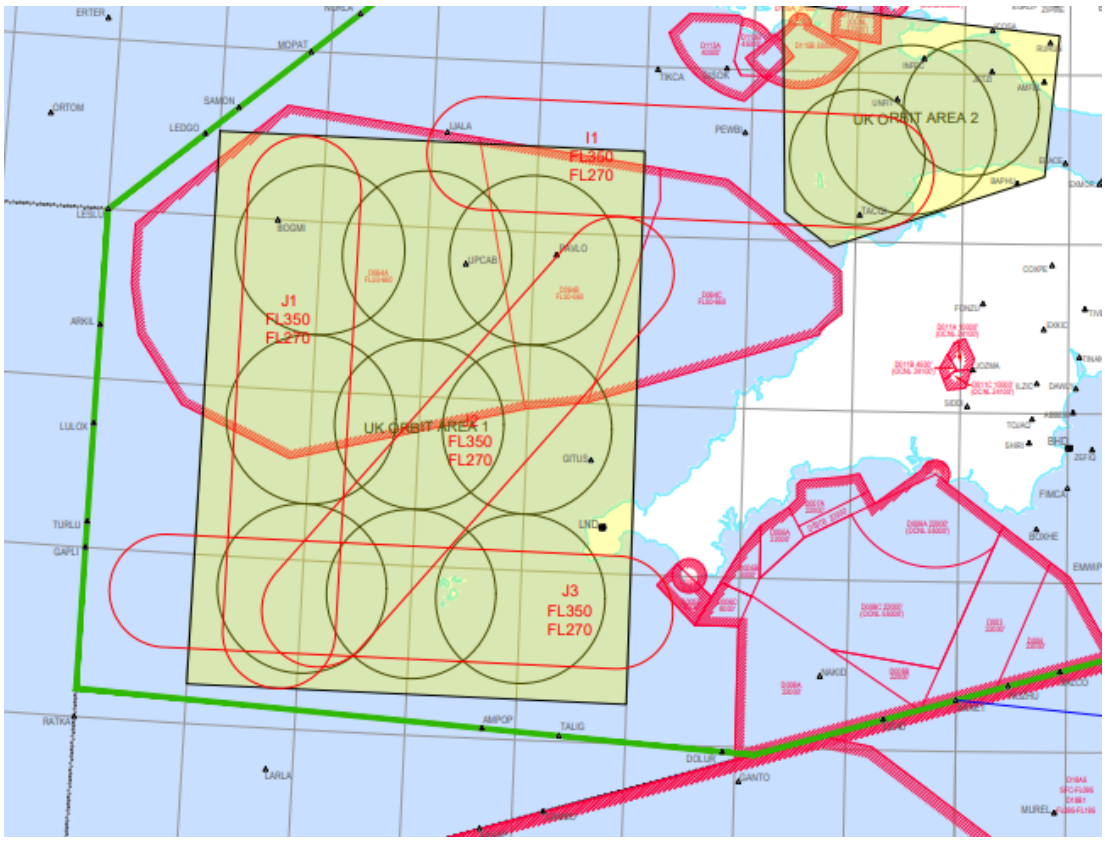


Figure 10 – I1 Bristol Channel and J1 to J3 Southwest Approaches

Bristol Channel

- 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

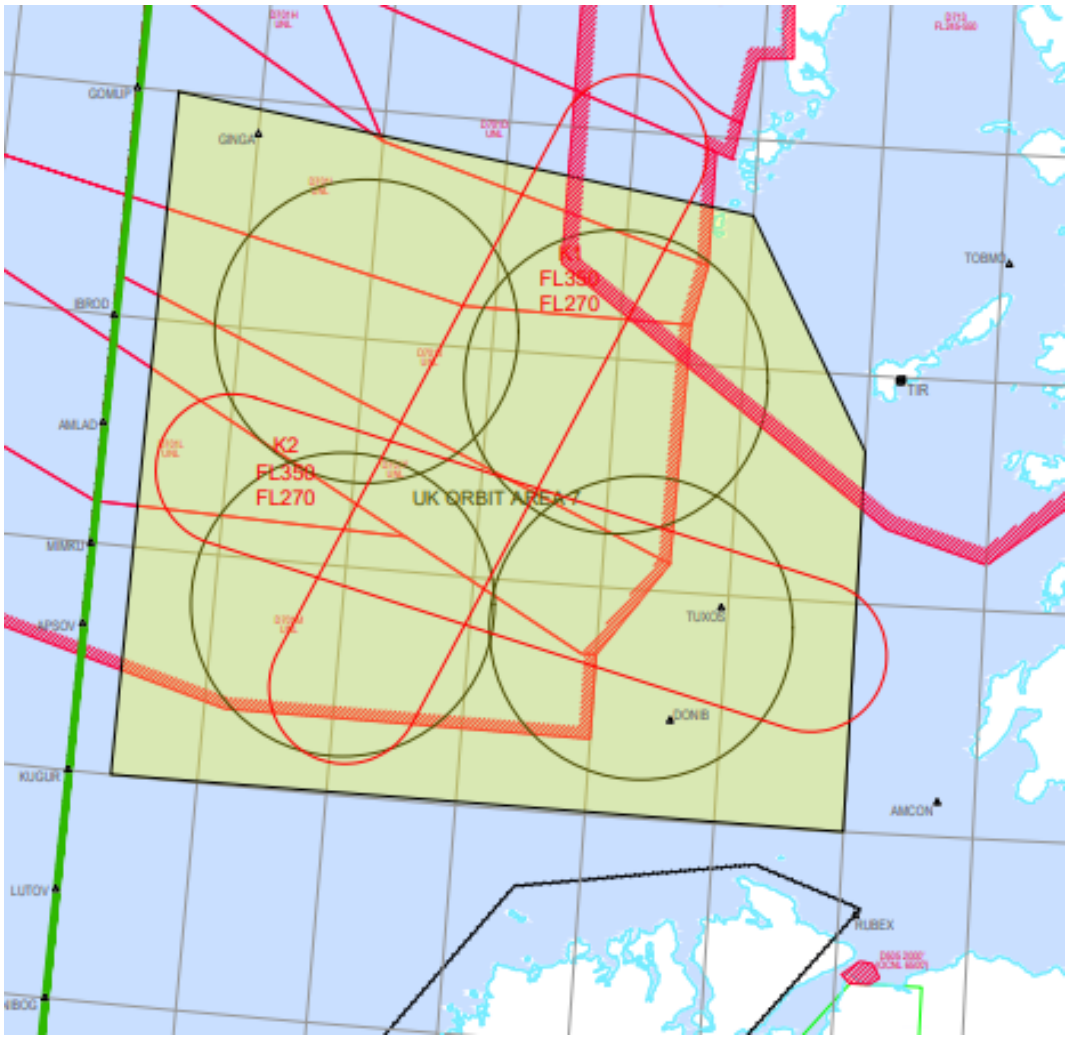


Figure 11 – K1 to K2 Benbecula

- 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).

Design Option Conclusion

10.2 The proposed option, “Create dedicated E-7 areas” provides considerable benefit over Option 0, the Baseline “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 operations, 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 E-7 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.

10.3 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.**

11. Detailed Description of Anticipated Operational Impacts

11.1 **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.

11.2 **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.

11.3 **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.

11.4 **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.

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

12. Supporting Infrastructure and Resilience

12.1 The E-7 operating areas are similar to the existing E-3 operating areas. Existing infrastructure will be utilised and modified where necessary to allow the safe introduction of the new areas.

- ATC radar maps and charts will be updated in line with the AIRAC cycle.

- No additional ATC personnel will be required to provide tactical control of the E-7 vice the E-3. The co-location of the new E-7 areas alongside the existing E-3 areas will aid familiarity for controllers and minimise workload during the initial change period.

- Whilst ATC communications at the extremities of the proposed E-7 operating areas was highlighted by NATS in their engagement response 78 Sqn have not raised any concerns with respect to communications at range. The E-7 has a comprehensive suite of radios and satellite communications that could be utilised in extremis. During the E-7 Test and Evaluation phase in early 2025 the sponsor will conduct communication trials at the extremities of the areas to ascertain if any issues are identified and need remedial action.

13. Regulation, Policies and Harmonisation

13.1 There are no regulation, policies and harmonisation issues involved with the introduction of the new E-7 operating areas. The airspace is non-segregated and will be tactically managed between the 2 main stakeholders, NATS and the MOD. The applicable LOAs have been revised and updated; draft copies are available at Annexes B and C. NATS will review and revise any LOAs with adjoining ATC sectors as a result of the introduction of the new E-7 operating areas.

14. Safety

14.1 The proposed E-7 operating areas in this ACP have been deliberately chosen to be co-located with the extant E-3 operating areas (a small number of new areas have also needed to be created). This will maintain familiarity of airspace for both the E-7 crews, Airspace Battle Managers, Air Traffic Controllers, NATS and the airline operators. Because of this familiarity, and the fact that the airspace is non-segregated, controllers will be able to co-ordinate traffic in an expeditious manner providing safe and timely coordination and deconfliction in a predictable traffic environment. Known operating areas along with Traffic Alert and Collison Avoidance System (TCAS) and the

ability of the E-7 to generate its own air picture all further assure that the risk of collision is As Low as Reasonably Practicable (ALARP) and tolerable. The TCAS and MESA radar picture are already in situ on the E-7 to enable this to occur, the implementation of the dedicated operating areas is what the ACP strives to implement to complete the safe air picture.

14.2 The E-7 operating areas were deliberately constructed to be simple, of the same lateral and vertical dimensions (100nNM x 20NM racetracks between FL270 and FL350) and be non-segregated. Following engagement with NATS throughout 2023 all the areas were amended from boxes to racetracks to optimise available airspace. A few areas have also had their lateral and vertical dimensions altered to reduce the effect on ATC routings, ATC control sectors and climb out and descent profiles. This reduced complexity increases the capacity of the pilots operating in the airspace and the ATC agency providing a service. The simplicity of the new operating areas should ensure smooth, safe, and harmonious operations with both the E-7 and civilian air systems operating safely in the same predictable environment.

14.3 A safety assessment was presented with the Stage 2 Options Appraisal[14]. The Change Sponsor has also conducted a Defence Air Safety Occurrence Report (DASOR) search through the MoD Air Safety Information System (ASIMS), as well as a UK Airprox Board[15] search for any safety incidents involving the E-3 in its operating areas, or in transit to/from its operating areas, since 2010. The search includes TCAS Resolution Advisory's (RAs)[16]. Of the 15 incidents in the UK, all but one was filed as a TCAS (RA). This incident was assessed as a Category C Airprox – no risk of collision.

- 14 Sep 10 – E-3D airprox with a Tutor aircraft. Recovery to RAF Waddington at FL85. Resolved by ATC and TCAS[17].

14.4 None of the incidents included in this ASIMS search involved separation minima being eroded between the E-3D Sentry and civilian/mil traffic within the extant E-3 operating areas. This validates the robust procedures already in place and the importance of known operating areas for the E-7 in the future.

15. Environmental Assessment

Habitat, Noise and Environmental Impact

15.1 This section of the document shows the habitat, noise and environmental impacts of the preferred option; **introduction of dedicated E-7 Operating Areas**.

[14] See Ref 4
[15] UK Airprox Board aim to enhance air safety in the UK, in respect of lessons learned and applied from Airprox occurrences (near misses) in the UK.
[16] TCAS Resolution Advisory is an indication given to the pilot on his instruments to climb or descend to avoid conflict with another aircraft in close proximity.
[17] Airprox Report No 2010133.

Habitat Impact

15.2 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[18] - Habitats Regulations Assessment – Early Screening Criteria, Questions 1, the Change Sponsor concludes there is no requirement to assess Habitat impact.

Noise Impact

15.3 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 concludes that this is indeed the case for this ACP.

Environmental Impact

15.4 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[19].

NATS Assessment on Quantitative Modelling

15.5 NATS were engaged with regarding the value of investing in Quantitative Modelling[20]. The NATS Analytics team delivered the following conclusion:

*'*The view is that it is not possible to accurately assess the environmental impact of E-7 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)
- 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*'.*

[18] Environmental Assessment Requirements and Guidance for Airspace Change Proposals (caa.co.uk)
[19] See the Options Appraisal (FOA) at https://airspacechange.caa.co.uk/PublicProposalArea?pID=228
[20] 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.

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.

15.6 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

15.7 Notwithstanding the statements in paras 15.5 and 15.6 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.

15.8 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[21]) historical data[22] 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:

[21] 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.

[22] Source: ADSB Exchange

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

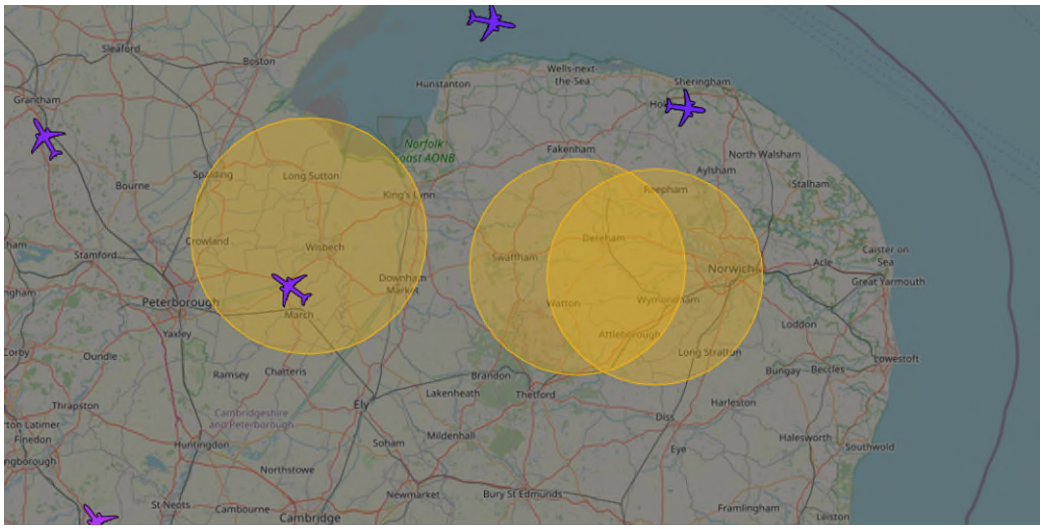


Figure 12 - 0942Z

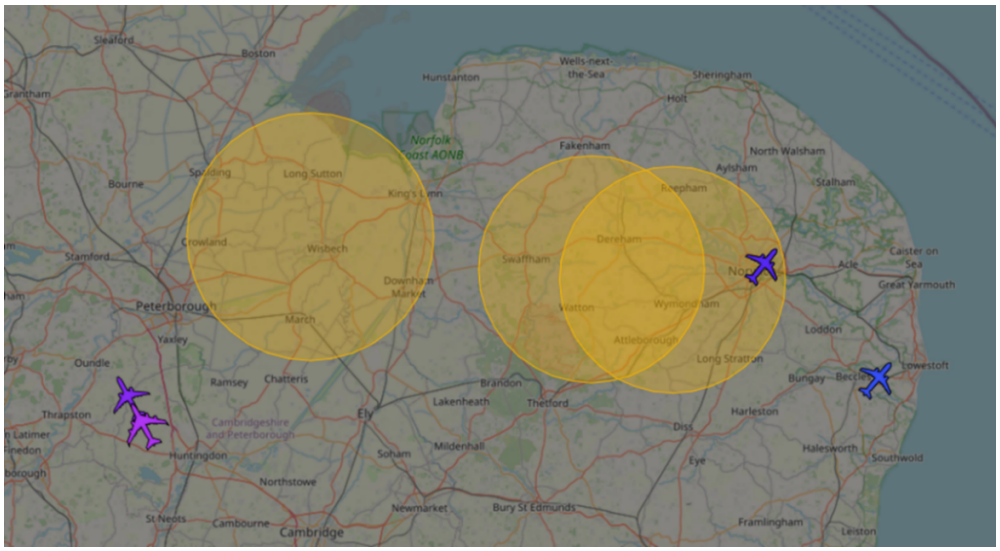


Figure 13 - 1134Z

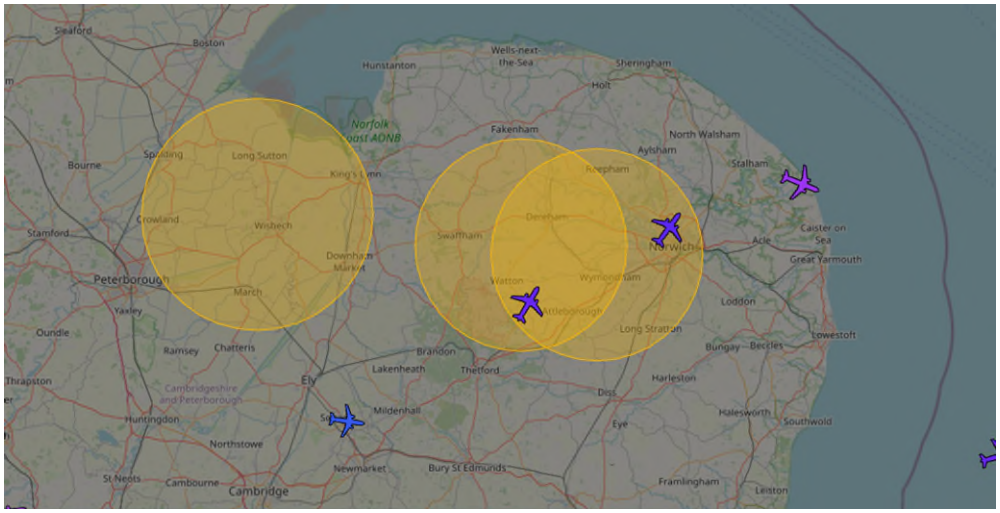


Figure 14 - 1303Z

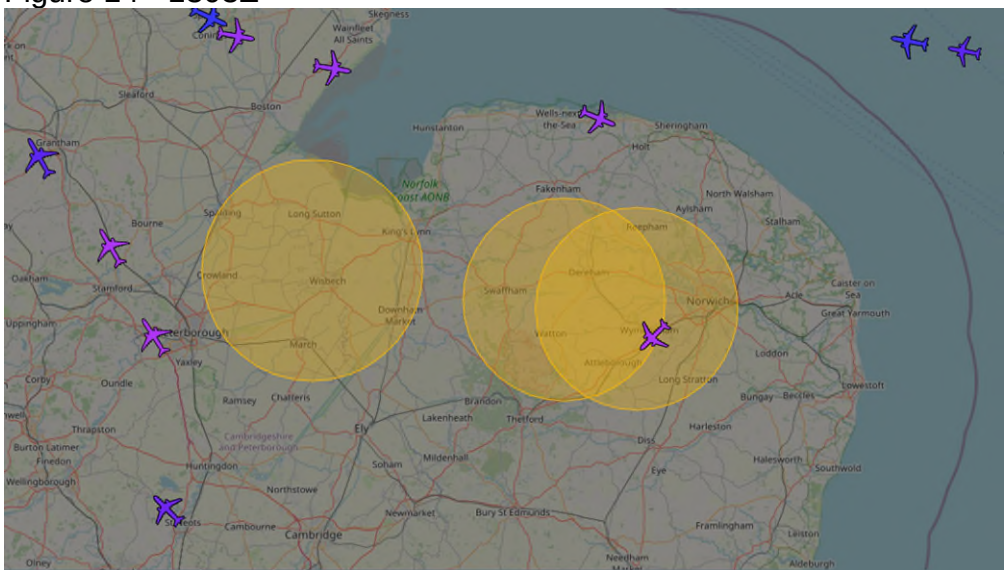


Figure 15 - 1515Z

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

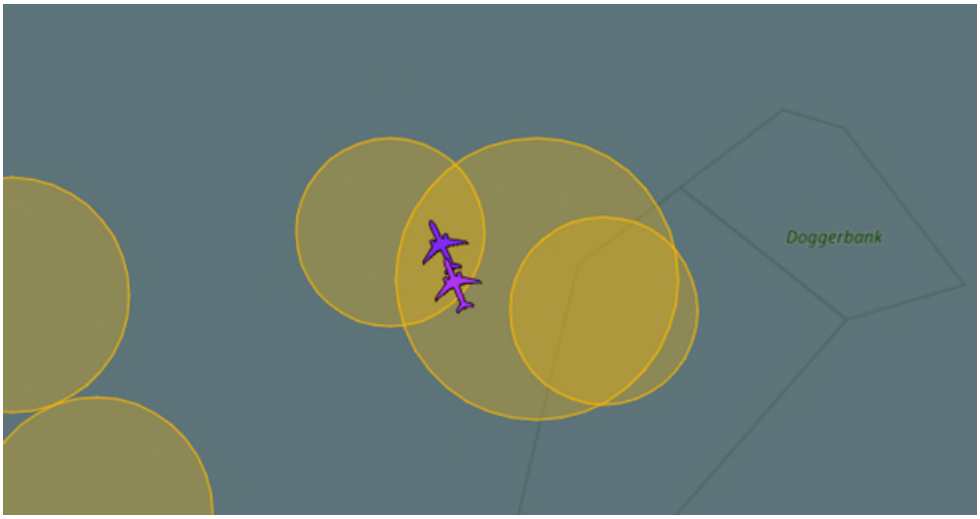


Figure 16 - 0847Z

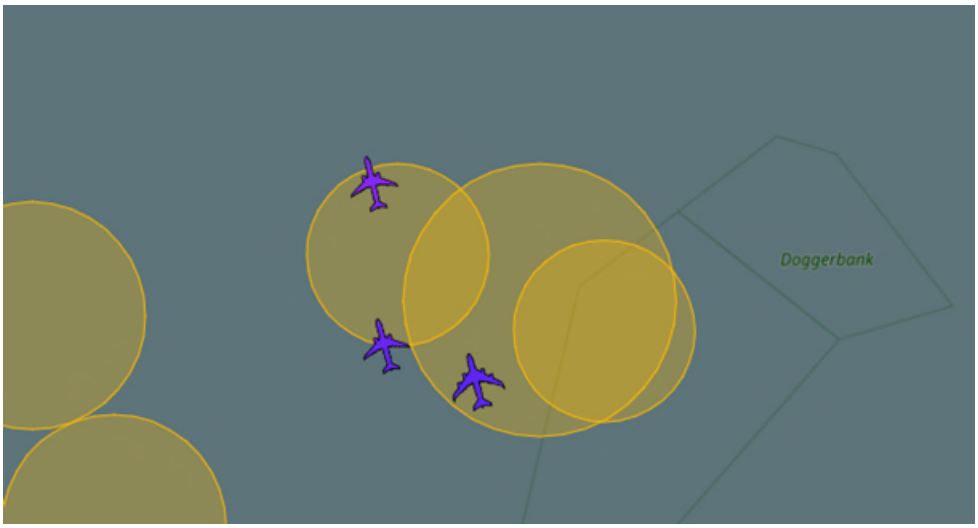


Figure 17 - 1031

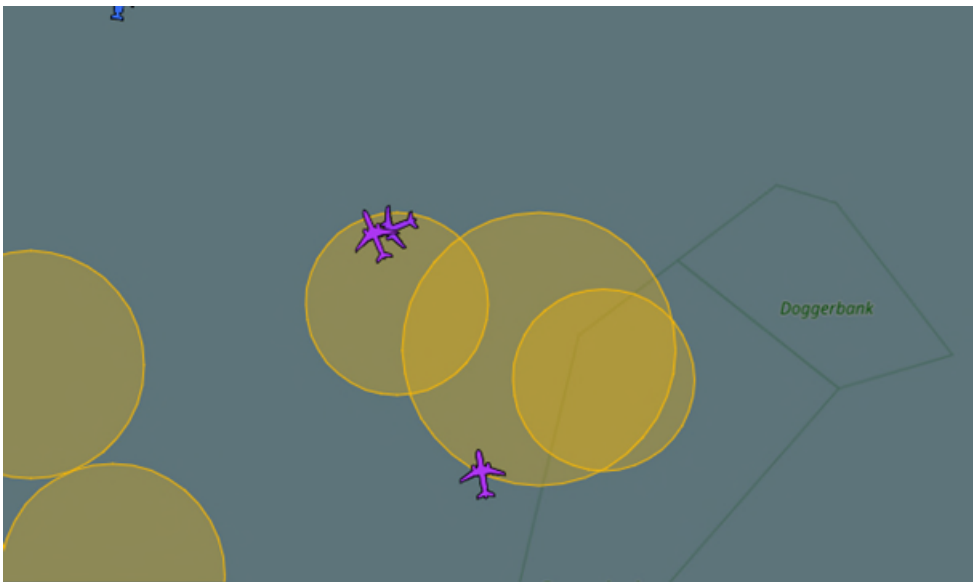


Figure 18 - 1112Z

15.9 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

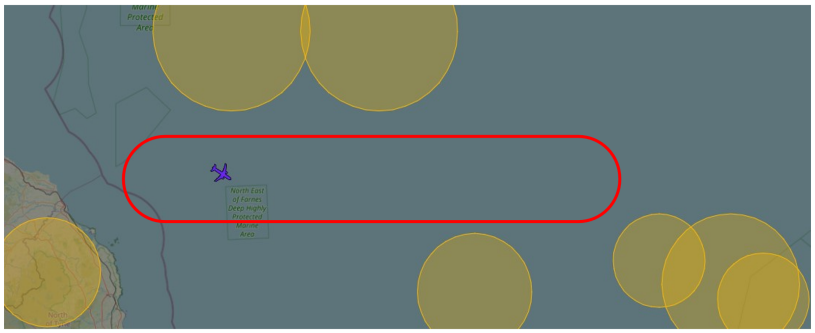


Figure 19 – 0844Z

28 Jul 23– 1056Z

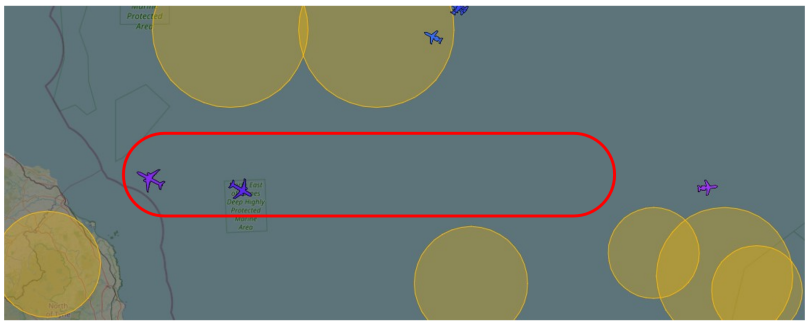


Figure 20 – 1056Z

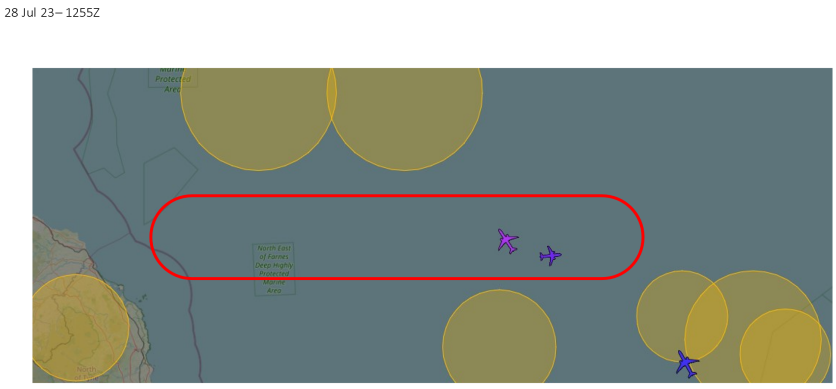


Figure 21 – 1235Z

15.10 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

15.11 The data in Tables 1-3 demonstrates that civilian airline traffic routes through the 2 extant E-3 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 15.4 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

15.12 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)

15.13 Potentially, the average number[23] 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.

15.14 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.

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

16. Final Options Appraisal

16.1 This has been updated form Stage 3 following feedback from targeted engagement. The qualitative impact analysis is provided below.

Group	Impact	Do-nothing (Option 0)	E-7 Areas (Option 2
Communities	Noise impact on health and quality of life	The operating heights of the extant E-3 areas are FL270-FL350. It is therefore assessed that there would be no noise impact on health and quality of life to communities. Moreover, the vast majority of the areas are located over the sea and therefore communities are not affected - this metric is outside the scope of this ACP.	As a Level 3, CAP1616 states that for aircraft above 7,000 feet, the prioritised environmental impact is CO2 emissions, and an assessment of noise impacts is not normally required. This proposal has the base of the E-7 operating areas at FL270, which will significantly reduce/mitigate all noise effects on the ground. Noise impacts were not a concern in any of the stakeholder engagement that was carried out prior to Stage 3. Moreover, the majority of the proposed areas are over the sea and would therefore not affect communities. This metric is outside the scope of this ACP.
Communities	Air Quality	The operating heights of the extant E-3 areas are FL270-FL350. It is therefore assessed that there would be no detrimental impact on air quality to communities in any of the geographical areas. Moreover, the vast majority of the areas are located over the sea and are therefore not affected - this metric is outside the scope of this ACP.	The operating heights of the proposed E-7 operating areas are FL270-FL350. It is therefore assessed that there would be no detrimental impact on air quality to communities in any of the geographical areas. Moreover, the vast majority of the areas are located over the sea and are therefore not affected - this metric is outside the scope of this ACP.

Group	Impact	Do-nothing (Option 0)	E-7 Areas (Option 2
Wider Society	Greenhouse gas impact	With continued use of the E-3 operating areas civil traffic could be routed in advance to avoid them or be allocated a transit FL that negates a climb or descent to transit through them (non-segregated airspace). This would result in nil/negligible additional fuel burn and have a nil/negligible increase in greenhouse gas impact. Moreover, there are 13 E-3 operating areas. On the vast majority of occasions only one operating area will be active so impact to civil traffic across the vast majority of the UK will be unchanged. Finally, operations over the weekend are by exception resulting in no change to civil traffic routings over this 48-hour period and therefore no change to CO2 emissions.	With dedicated E-7 operating areas civil traffic could be tactically routed in advance to avoid them or be allocated a transit FL that negates a climb or descent to transit through them (non-segregated airspace). This would result in nil/negligible additional fuel burn and have a nil/negligible increase in greenhouse gas impact. Moreover, there are 21 proposed E-7 operating areas. On the vast majority of occasions only one operating area will be active so impact to civil traffic across the vast majority of the UK will be unchanged. Finally, operations over the weekend are by exception resulting in no change to civil traffic routings over this 48-hour period and therefore no change to CO2 emissions.
General Aviation	Access	The operating heights within the extant E-3 operating areas are in the band FL270-FL350. It is therefore assessed that there would be minimal impact on General Aviation. The only identified exceptions are the BGA who can operate above FL240 in the TRA(G) Scottish Areas North and South from several gliding sites. On the occasions that one of these areas is active and conflicts with an E-3 orbit ATC co-ordination or a change of E-3 orbit is instigated. LoA exists to activate TRA(G).	The operating heights of the proposed E-7 operating areas are in the band FL270-FL350. It is therefore assessed that there would be minimal impact on General Aviation. The only identified exceptions are the BGA who can operate above FL240 in the TRA(G) Scottish Areas North and South from several gliding sites. On the occasions that one of these areas is active and conflicts with an E-7 orbit (D1 - Base FL290) ATC co-ordination or a change of E-7 orbit can be instigated. LoA that exists to activate TRA(G) to be reviewed and amended. This issue was identified and raised by the British Gliding Association (BGA) during Stage 2.
General Aviation/ Commercial Airlines	Economic impact from increased effective capacity	Outside the scope of this ACP.	Outside the scope of this ACP.

Group	Impact	Do-nothing (Option 0)	E-7 Areas (Option 2
Commercial Airlines	Fuel Burn	With continued use of the E-3 operating areas civil traffic could be routed in advance to avoid them or be allocated a transit FL that negates a climb or descent to transit through them (non-segregated airspace). This would result in negligible additional fuel burn. Also, the E-3 can climb or descend to ensure civil traffic can maintain their allocated FL through the operating area – this presents minimal degradation to the radar picture for a short duration climb/descent. Moreover, there are 13 E-3 operating areas. On the vast majority of occasions only one operating area will be active so impact to airlines across the vast majority of the UK will be unchanged. Finally, operations over the weekend are by exception resulting in no change to civil traffic routings over this 48-hour period and therefore no change to fuel burn.	With dedicated E-7 operating areas civil traffic could be tactically routed in advance to avoid them or be allocated a transit FL that negates a climb or descent to transit through them (non-segregated airspace). This would result in nil/negligible additional fuel burn. Also, the E-7 can climb or descend to ensure civil traffic can maintain their allocated FL through the operating area – this presents minimal degradation to the radar picture for a short duration climb/descent. Moreover, there are 21 proposed E-7 operating areas. On the vast majority of occasions only one operating area will be active so impact to civil traffic across the vast majority of the UK will be unchanged. Finally, operations over the weekend are by exception resulting in no change to civil traffic routings over this 48-hour period and therefore no change to fuel burn.
Commercial Airlines	Training Costs	No additional training costs to commercial airlines as a result of using the extant E-3 operating areas.	No additional training costs for commercial airlines as the service provided is unchanged, with standard separation being provided against all known traffic. Commercial pilots are unlikely to be familiar with the current arrangements for E3s so using the same procedures for E7 is as equally unknown to them.
Commercial Airlines	Other Costs	No additional costs to commercial airlines as a result of using the extant E-3 operating areas.	No additional costs to commercial airlines as a result of using this airspace option.
Airport / Air Navigation Service Provider	Infrastructure costs	No additional infrastructure costs to airports or air navigation service providers as a result of using the extant E-3 operating areas.	No additional infrastructure costs to airports or air navigation service providers as a result of using this airspace option.
Airport / Air Navigation Service Provider	Operational Costs	No additional operational costs to airports or air navigation providers as a result of using the extant E-3 operating areas.	No additional operational costs to airports or air navigation providers as a result of using this airspace option.

Group	Impact	Do-nothing (Option 0)	E-7 Areas (Option 2
Airport / Air Navigation Service Provider	Deployment Costs	No additional deployment costs to airports or air navigation service providers as a result of using the extant E-3 operating areas.	No additional deployment costs to airports or air navigation service providers. Radar maps and charts will be updated in line with the AIRAC cycle.

17. List of Supplementary Documents

Annex A: Engagement Summary Report - ACP 2020-024 E-7 Wedgetail Operating Areas
Annex B: Draft LOA between MOD and NATS (Interface Document 8 (ID8)).
Annex C: Extract Showing Draft Insertion to Letter of Agreement Between NATS (En Route) PLC (“NERL”) And British Gliding Association (“BGA”) And 78 Squadron, Swanwick (Military) And BAE Systems Warton.
Annex D: ADQ Compliant data (NATS Aero Data Sheet).
Annex E: Raw evidence emails (redacted).