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## **ACP 2020-026**

### **GATEWAY DOCUMENTATION: STAGE 2 Develop and Assess**

### **STEP 2a(i) Options Development Version 2**

## Contents

Title	Page
Introduction	<a href="#">3</a>
Statement of Need	<a href="#">4</a>
Design Principles	<a href="#">5</a>
The Proposal	<a href="#">6</a>
Current Situation	<a href="#">7</a>
Options Development	<a href="#">14</a>
Free Route Airspace	<a href="#">19</a>
Design Options Summary	<a href="#">20</a>
Eliminated Options	<a href="#">21</a>
Next steps	<a href="#">23</a>
Stakeholder Feedback	<a href="#">24</a>
Summary	<a href="#">29</a>

## References

1. CAP 1616 Airspace Change Process
2. All published documentation related to this airspace change proposal is available on the CAA Airspace Change portal:  
<https://airspacechange.caa.co.uk/PublicProposalArea?pID=257>
3. CAP 1430 UK ATM Vocabulary
4. CAP 740 UK Airspace Management Policy
5. ACP-2020-042  
<https://airspacechange.caa.co.uk/PublicProposalArea?pID=253>
6. ACP-2021-007  
[Airspace change proposal public view \(caa.co.uk\)](#)
7. MAA RA 2000 Regulatory Articles (Flying)
8. CAP 2091 CAA Policy on Minimum Standards for Noise Modelling

## Introduction

The Ministry of Defence (MoD), and specifically 11 Group Training Enablers, is the change sponsor for this proposal. The proposal seeks to secure Future Combat Airspace (FCA) for the use by UK and multi-national partners during occasional large scale, highly complex, multi-domain collective training exercises that are used to prepare aircrews for operational service. This proposal complies fully with the strategic aim as laid down in Annex C of CAP 740.

*“The strategic aim for Defence ASM is to enable all arms of Defence to 'train as they would fight' by safeguarding long term access to appropriately sized and sited airspace, which can be reserved for hazardous activities, while minimising the impact on other airspace users.”<sup>1</sup>*

This document forms part of the Airspace Change Proposal (ACP) process as defined in CAP 1616. For ease of reading the Statement of Need and Design Principles are re-iterated before the document outlines the Proposal. We then align the proposal with the design principles and demonstrate how the design principles have shaped the option. To demonstrate the options considered by the sponsor prior to proposing the option, 5 eliminated options are described with reasons why they were not progressed.

The CAP 1616 requires the sponsor to develop one or more options that address the statement of need and align with the defined design principles. This document will justify the proposal of only one option whilst demonstrating that other options have been fully considered.

This is version 2 of this document and in order to demonstrate the evolution of this ACP, engagement feedback received after version 1 is included. The sponsor then answers those points raised with an explanation as to how the feedback has influenced this version.

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<sup>1</sup> CAP 740, Page 41, para C1

## Where are we in the Airspace Design Process?

We have completed Stage 1 Define, where we established the need for an airspace change and the design principles underpinning it. We are now in Stage 2; Develop and Assess and this document is version 2 of 2a after the first was reviewed following feedback from the CAA.

### Stage 2 Develop and assess

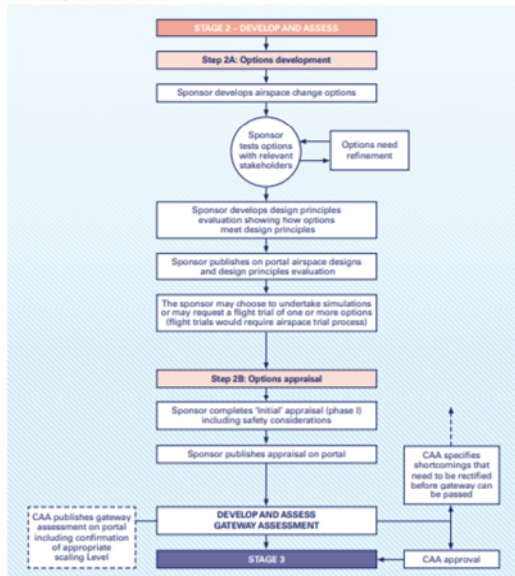


Figure 1. CAP1616 Airspace Change Process Stage 2

## Why is the change needed?

With the introduction of 5<sup>th</sup> generation<sup>2</sup> aircraft into the RAF inventory in the form of the Lightning F35, larger, rectangular portions of airspace are needed so that crews can participate in realistic training, employing tactics which would be used in a hostile environment. This document will explain why the current Manged Danger Areas (MDAs), although suitable for routine flying training, are of incorrect orientation, location and dimensions for a full simulated Combat Air Operation involving participants from the UK along with our NATO allies.

## What was the statement of need for this proposal?

Air Command, on behalf of the Ministry of Defence, has an obligation to provide relevant tactical collective training to its combat and combat support forces to ensure UK Forces are correctly prepared to defend UK interests in line with the UK Defence Strategy. An appropriate airspace is required to meet this need; it must safely facilitate exercising large forces of modern and future air platforms in an efficient and representative combat environment.

Core military requirements:

Minimising the risk of Mid-Air Collisions (MAC) to the maximum extent whilst enabling;

- Full tactical employment of aircraft and weapons capability
- Supersonic flight and rapid height changes
- Overflight and loiter of rural overland (target) areas
- Use high and low altitude activity concurrently
- Representative employment ranges of simulated air-air and air-surface weapons
- Representative operational numbers
- Ability to oppose from ground and air simultaneously
- Contested in electromagnetic environment

<sup>2</sup> Fifth generation aircraft are those such as the F-35 and F-22 which combine advanced stealth with extreme manoeuvrability, supersonic cruise and information fusion.

## Design principles

The design principles (DPs) were set following engagement with representative stakeholder groups as part of CAP1616 Stage 1; the DPs and their relative priorities are shown below. The aim of this document is to satisfy stakeholders that the design option aligns with these design principles.

The table below comprises a consolidated list of the DPs at the end of Stage 1B, accepted by the CAA as a well-founded shortlist of principles to inform the development of airspace design options. Safety is the highest priority and DP(a) is automatically assigned Priority 1.

The MoD feels that the ability to complete its training and operational objectives is next in priority after safety and, since no stakeholder contested this, DP(b) is assigned Priority 2 along with the corresponding DP(e) about minimising impact to other airspace users.

The method of determining the remaining DPs order of prioritisation was determined by the comments received, not just upon the volume of responses. It is anticipated in CAP1616 that design principles may conflict or that some would be more important to one organisation than another. Therefore, blending of the principles is required and, recognising all the comments provided through engagement, they are summarised as follows:

Priority	Design Principle
1	DP(a) The airspace design must be safe, with any hazards identified and risks mitigated such that they are as low as reasonably practicable and tolerable.
2	DP(b) The training area will be within efficient reach of RAF / United States Air Force (Europe) (USAFE) Main Operating Bases. DP(c) Optimise the airspace design to accommodate periodic large-scale multi-domain collective training activities. DP(e) Minimise impact on other airspace users and the network.
3	DP(h) Minimise the impact to Commercial Air Traffic flow, sector complexity and sector capacity. DP(g) Minimise environmental impacts including CO2 emissions. DP(f) Minimise environmental impacts including noise (where relevant).
4	DP(d) Optimise Airspace Management (ASM) applying Flexible Use of Airspace (FUA) principles and ASM Policy
5	DP(j) Minimise complexity in flight planning. DP(i) Optimise protocols for deconfliction of simultaneous activations of multiple volumes of Special Use Airspace. DP(k) Maximise the incorporation of results of the MOD's supporting Airspace trial – ACP-2020-042.

**Table 1. Design Principles**

## The Proposal

CAP 1616 page 39,

### Step 2A Options development

The change sponsor develops one or more options that address the Statement of Need and align with the defined design principles.

Our proposal is for a permanent segregated portion of airspace, on the East of the UK and activated for Large Force Exercises. Minimum dimensions 90nm x 160nm and from FL85-FL660, predominantly based over the sea but with an overland portion on the shortest edge. Following feedback from stakeholders, it is clear that it should avoid CTAs, TMAs and allow all airports connection to the route network. The main question from stakeholders related to frequency of activation, because of their concerns, MoD proposes to activate it for the shortest possible durations and only for Large scale, named exercises.

The selection of this geographical area considers current aerial activity and the location of ATS routes. This area satisfies the statement of need with regards to the requirement to be within flying distance of the main RAF bases without having to cross busy routes and with a suitable number of diversion airfields available. Most of the airspace is over the high seas therefore is suitable for supersonic events. The peach area in Figure 2 shows the proposed area.



**Figure 2:**  
**Proposed area of segregated airspace**

## Stakeholders

Stakeholders were identified in Stage 1 of this ACP, now that the location of the change has been proposed it is possible to narrow down further those stakeholders requiring engagement during this stage and consultation in stage 3. Ideally the MoD would like the base level to be SFC, an explanation as to why this is not proposed can be found within **DP(c)** on page 14.

### Airports

Aberdeen, Dundee, Edinburgh, Newcastle and Teesside.

### ANSPs

NATS, NATS PC, Swanwick Mil (78 Sqn)

### Other airspace users

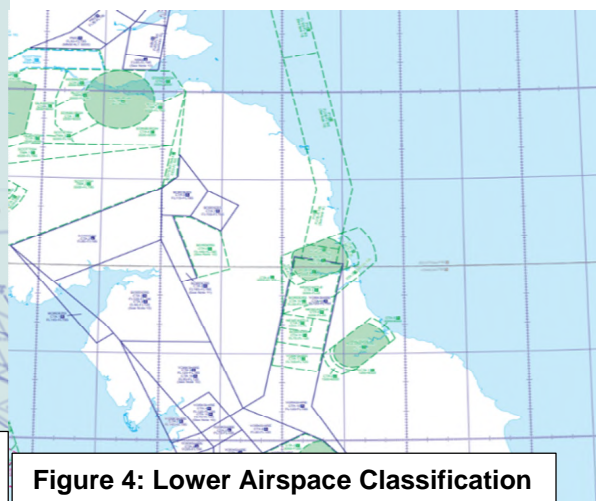
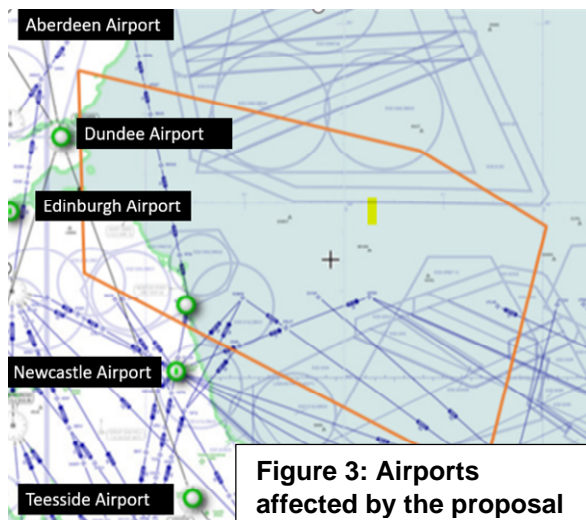
Borders Gliding Club, General Aviation Alliance, Low Fare Airlines.

### MOD Stakeholders

Joint Tactical Exercise Planning Staff (JTEPS), 92 Sqn, 78 Sqn, RAF Leuchars, DAATM, Draken, USAFE, 1Gp, 2Gp.

MoD presents only one option for this ACP however this document aims to satisfy stakeholders that it aligns with all DPs, engagement feedback has been acted upon and that other options have been considered.

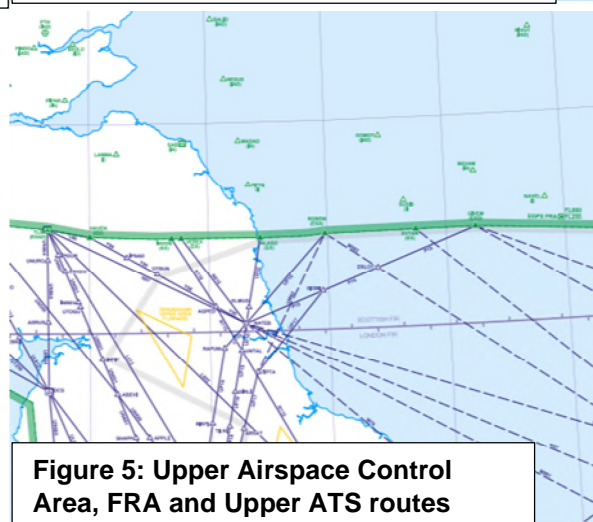
## Current Situation



The region hosts a number of airports and other airspace users, including gliding sites. It straddles the London and Scottish FIR with Low Flying Areas 12 and 16 situated within.

Most of the airspace within the area up to FL195 is Class G and although military aircraft can already operate freely within this, segregation is sought in the interests of safety. A number of reporting points and UAS routes are within the proposed area, see figures 4 and 5.

In addition, there are a handful of FRA waypoints in the Scottish FIR which may be unavailable depending on the final shape of the proposed SUA.



North Atlantic Tracks operate through this area when a Northerly flow is in use; this is dependent on the position of the Gulf stream with forecasts usually published a week in advance. The general peak traffic time for the Oceanic traffic is up to 1000L and after 1800L.

Currently, depending on the routings of the NAT, D323L-R may have an upper limit of FL300 between 1000hrs and 1400hrs local, if the NAT tracks are required to route through the airspace. This allows 2 civil routes (P58 and P59) to be available for flight planning from FL320 and above.

The airspace over the UK is congested and, in compliance with **DP(h)** this proposal avoids the spine of the UK which contains the busiest routes.

Newcastle, Dundee, Edinburgh, Aberdeen and Teesside may all be affected by the proposal due to reporting points and ATS routes being unavailable, in particular, routes via CUTEL or P18. Figure 6 displays the routes to the Copenhagen and Amsterdam FIR used by Newcastle and Edinburgh traffic when D323 and D613 are active. When D323/613 are inactive more direct routes to the Amsterdam FIR are available, illustrated at figure 7. **For comparison purposes, during 2b the baseline option will be with D323 and 613 active in order to compare periods of military activity.**

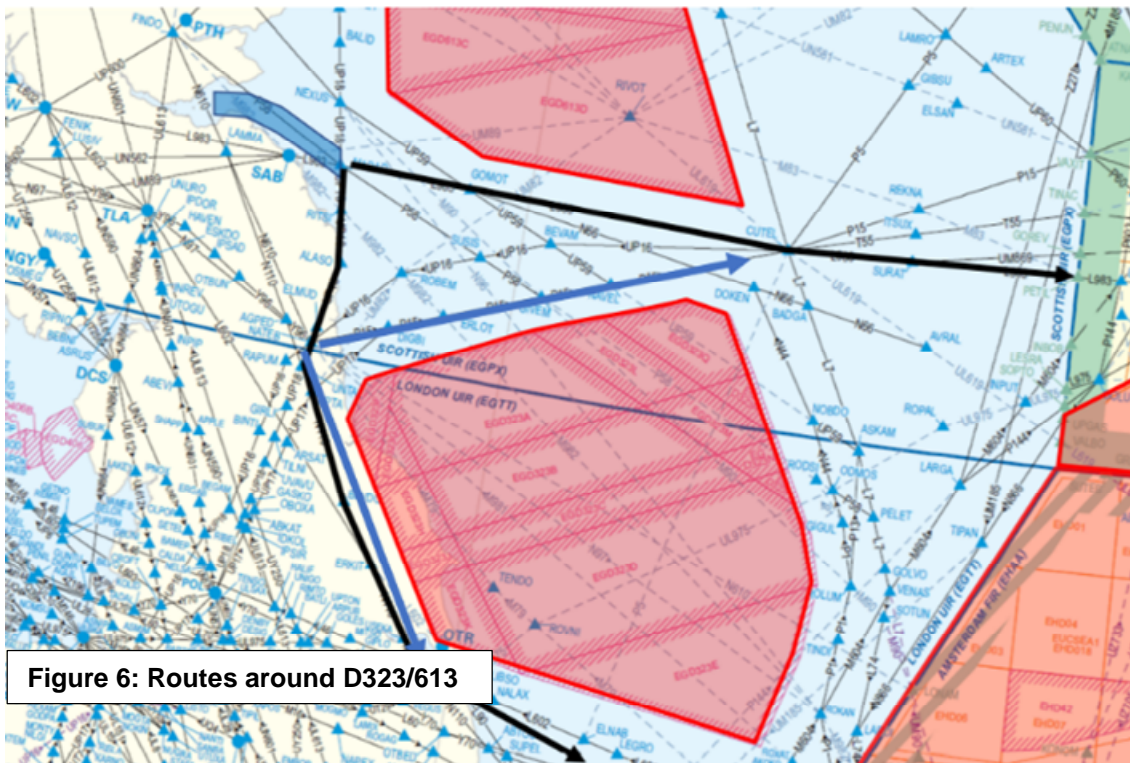


Figure 6: Routes around D323/613

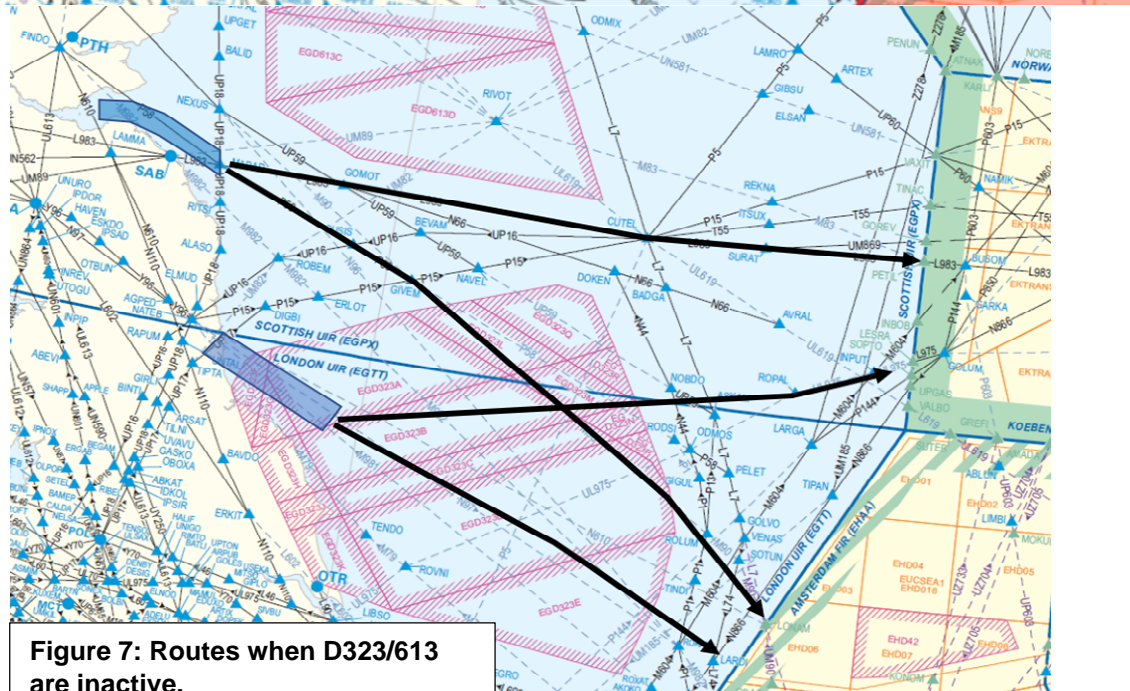


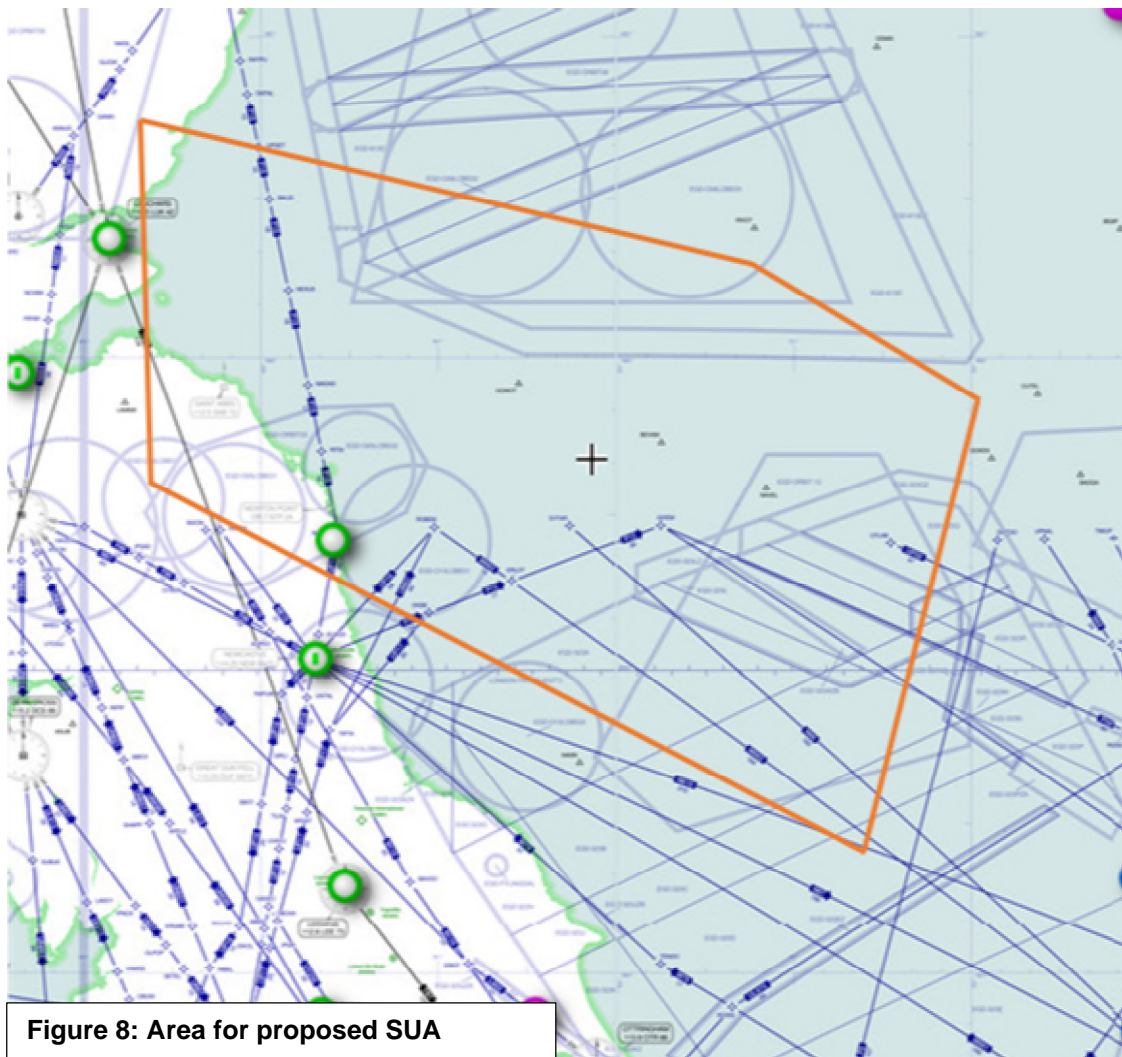
Figure 7: Routes when D323/613 are inactive.



## Routes affected

The proposed SUA, when active, would render some routes unavailable and necessitate aircraft having to take a longer track as a result. Figure 8 shows an approximate area for the proposed SUA.

Although this proposal is for activation between FL85 and FL660, it is only for around 3 hours at a time, although it is accepted that an additional period would be required for a FBZ. These affected routes would only be unavailable for around 5 hours at a time and only during notified and agreed periods. During Stage 3 of this process the sponsor will consult NATS and ANSPs to determine the optimum timing for activations.



## P18

P18 provides a direct route from Aberdeen to both Newcastle and Amsterdam. The NATEB to ADN portion is available between Fri (or the day preceding a PH) 1500 (1400) to Mon (or the day following a PH) 1000 (0900); Tue-Fri 0530-0900 (0430-0800).

May-Sep, Mon-Thu 1900-0900. It is unavailable for Flight Planning at all other times<sup>3</sup>. This route is almost wholly within the area subject to this proposal. There are daily flights between Aberdeen-Newcastle and Aberdeen-Amsterdam. It is likely that daytime

SUA activations will be outside of these times however there will be occasions where night-time activations are required. The dashed line in Figure 9 shows the P18 route with the solid line showing the route to be taken when P18 is not available.

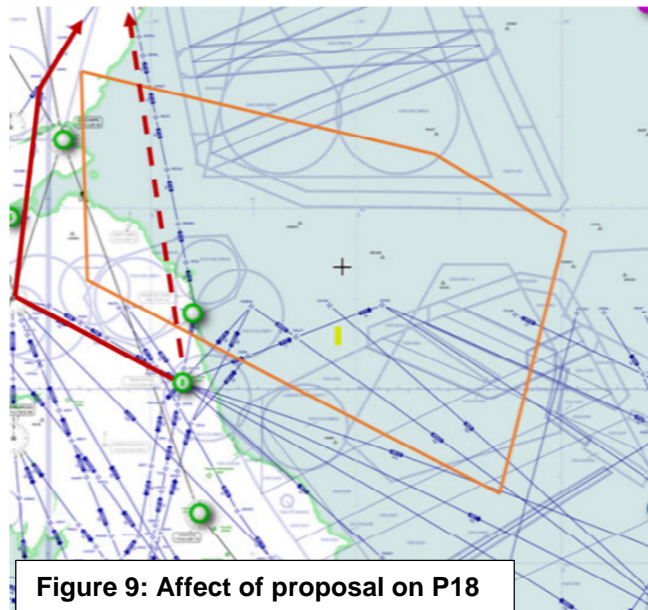


Figure 9: Affect of proposal on P18

## Newcastle Airport

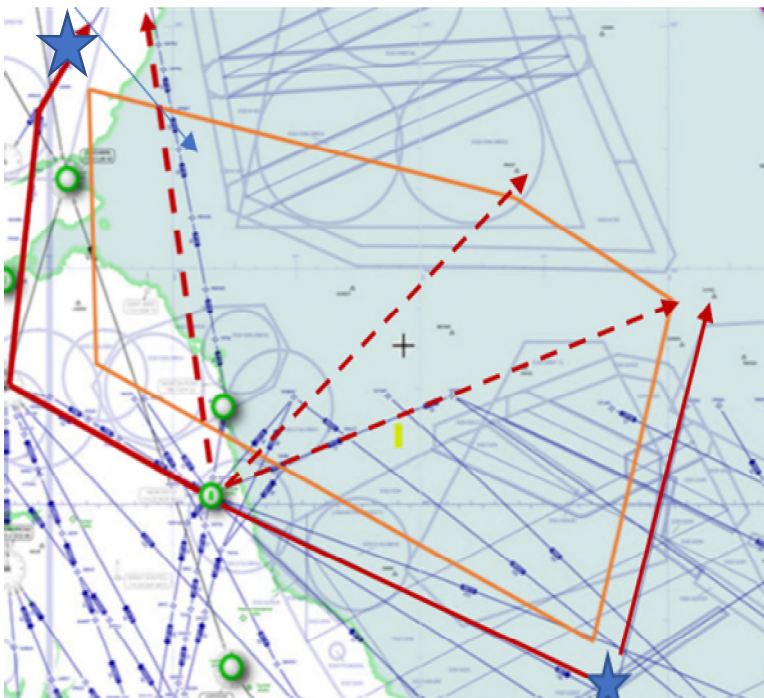


Figure 10: Affect of SUA on Newcastle Airport with suggested alternative reporting points

In addition to routes to Aberdeen via P18, departures and arrivals via RIVET and CUTEL are likely to be affected. Aircraft would have to take a detour and the star on Figure 10 could be a location for an alternative reporting point en-route CUTEL. It is proposed that aircraft affected by the closure of this route could be provided a service by 78 Sqn, Swanwick (Mil).

Although their routes are affected, **published arrival and departure profiles would still be used therefore there is no change to patterns below 7000'**.

<sup>3</sup> [AIP ENR 3.1](#)

## Teesside Airport

Although not affected to the same extent as Newcastle, the impact of the unavailability of routes DCT CUTEL and RIVET could be compensated by alternative reporting points as detailed in Figure 10. Their main affected route would likely be the daily Loganair flight to Edinburgh. Should there be any affected routes which would normally route via CUTEL, the proposal is for 78 Sqn to provide an ATS with an alternative routing point used.

## Edinburgh Airport

If the SUA is designed to avoid N864 and P600 then connection to the Copenhagen and Oslo FIR can be maintained. A design which avoids all TMAs would be pursued therefore avoiding changes to any published departure and arrival profiles. An alternative reporting point on the North Western corner of the proposed SUA (see Figure 10) would act as a pivot for any Easterly routes in the absence of RIVET and CUTEL. Edinburgh airport have stated during stage 2 engagement in response to the question “**will this proposal affect your traffic pattern below 7000**” that “**there is no discernible effect on our current traffic pattern**”.

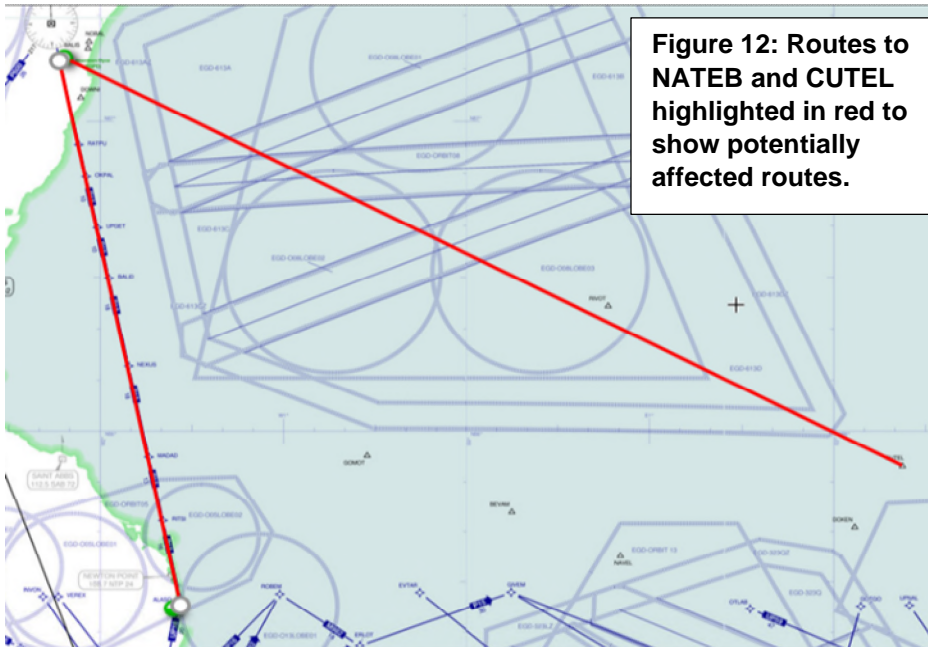


## Dundee Airport

Dundee have regular flights to London and Belfast. The proposed SUA will not infringe upon N864 therefore their routes and traffic patterns should not be affected. Dundee have engaged late in the process with some concerns, see page 27, further consultation will occur during stage 3 to incorporate these.

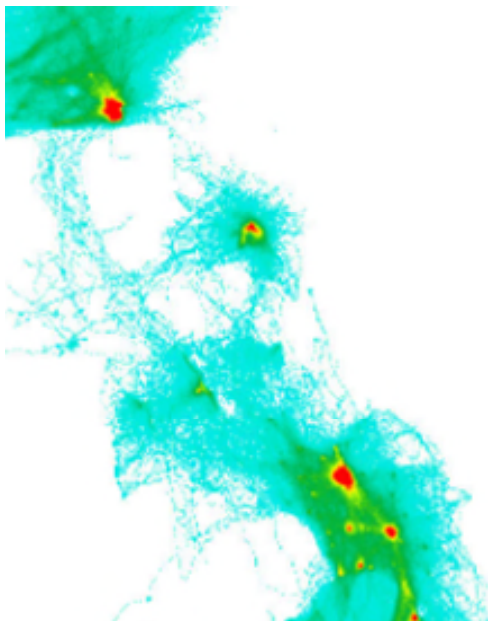
## Aberdeen Airport

Their daily routes between Newcastle, Teesside (both Eastern Airways) and Amsterdam are likely to be affected depending upon activation timings and availability of P18. By shaping the proposed SUA intelligently, it could be possible to maintain air routes to the East via RIVET/CUTEL.



This proposal does not affect the Aberdeen CTR and CTA, standard published arrival and departure profiles can be flown, **traffic patterns below 7000' will not be affected.**

## VFR activity



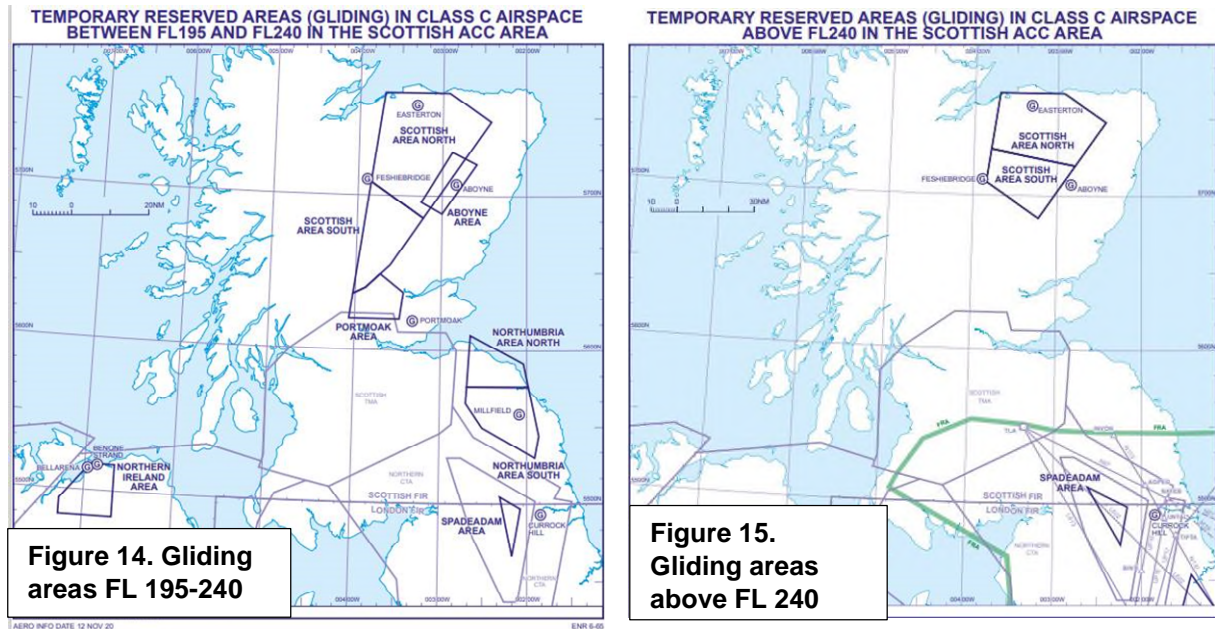
**Figure 13. Heatmap of VFR activity**

Figure 13 is a heatmap of VFR activity, produced by the Future Airspace Strategy VFR Implementation Group (FASVIG) in 2018. This clearly shows that the area in the Northeast of England which is subject to this ACP is a hotbed of activity. For this reason, this ACP will seek the minimum overland portion to fulfil operational requirements.

We also propose a base of FL85 to allow much of the VFR activity to continue although this would restrict some of the training serials the MoD would otherwise wish to programme.

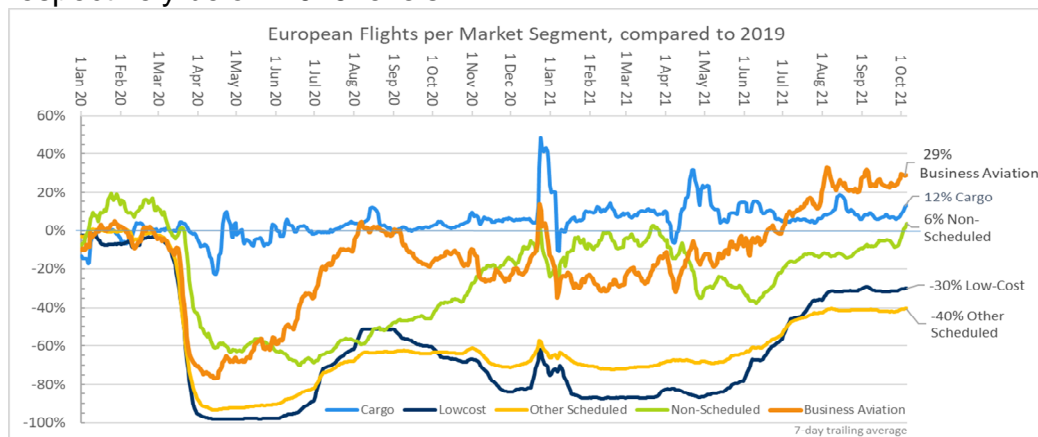
## Gliding

The Borders Gliding Club (BGC) is a key stakeholder. They routinely operate up to FL245 when conditions allow and would be detrimentally affected financially with a restriction to their operations. Clear lines of communication would be required in order to notify activation dates and times.



## Covid-19 impact

A common point raised during engagement has been the impact of C-19 on the aviation industry. The graphic below<sup>4</sup> shows that while some segments have recovered, the “low-cost and other scheduled” are still operating at 30% and 40% respectively below 2019 levels.



**Figure 16 – Effect of Covid on European flights**

<sup>4</sup> [EUROCONTROL Data Snapshot #20 on recovering flights and increasing delays](#) dated 9 Nov 21.

In the October 2021 budget, taxes on domestic flights were reduced with the aim of revitalising the passenger airline industry. One of the key stakeholders, Newcastle International airport, has a substantial proportion of their traffic from these segments. Flights between the USA and Europe have only recently been reactivated and are not yet operating at pre-Covid levels; during any modelling of options during stage 3 of the CAP 1616 process it will be important to use 2019 traffic levels if the industry has not recovered fully.

## Options Development - Use of Design Principles to shape the option

**DP (a)** The airspace design must be safe, with any hazards identified and risks mitigated such that they are as low as reasonably practicable (ALARP) and tolerable.

Within the proposed SUA, high energy manoeuvres would be taking place with the use of ordnance, munitions and explosives; electrical and optical hazards would be present. Air Combat Training (ACT) and Intercept Training involve aircraft manoeuvring dynamically at the extremes of their operational envelope within 3 dimensions with a turning performance up to 9G and with closing speeds of up to 32 miles per minute through large blocks of airspace.

During Electronic Warfare (EW) serials, the aircraft sensors would potentially be degraded, reducing the situational awareness of the crew.

Night sorties will sometimes be flown with the aircraft extinguishing external lights and operating on NVG, restricting their perception. Closure speeds and high energy manoeuvres would be similar to those flown during daylight.

For these reasons, the sponsor does not consider a Temporary Reserved Area<sup>5</sup> as safe; a segregated, non-permeable portion of airspace is proposed.

Although the UK Joint and Integrated approach<sup>6</sup> encourages sharing of airspace rather than segregating, MoD firmly believes that in the case of Large Force Exercises ((LFE) exercises with more than 10 aircraft in a single package)<sup>7</sup> segregation is the only safe method of Airspace Management (ASM).

It is proposed that the airspace be activated for short term periods (~3 hours at a time) and would therefore fall under the definition of a Temporary Segregated Area

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<sup>5</sup> Temporary Reserved Area (TRA) means a defined volume of airspace normally under the jurisdiction of one aviation authority and temporarily reserved, by common agreement, for the specific use by another aviation authority and through which other traffic may be allowed to transit, under ATC clearance.

<sup>6</sup> CAP 740 3.19 – Benefits of the J&I protocol

<sup>7</sup> Air Force Instruction 11-214 dated 8 July 2020. [afi11-214.pdf](#)

(TSA)<sup>8</sup>. As this TSA is for military use and is proposed to be predominantly situated over the high seas it satisfies the definition of a Managed Danger Area (MDA).<sup>9</sup>

The term “Special Use Airspace” (SUA) covers all types of airspace used for military purposes and will be the term used for the proposal during this stage of the process.

**DP (b)** The training area will be within efficient reach of Royal Air Force (RAF), United States Air Force (Europe) (USAF(E)) main operating bases.

The figure below and associated text details the assets based at each station.



**Figure 17. RAF Main bases and their contribution to air exercises.**

- RAF Lossiemouth – F35, ISTAR
- RAF Spadeadam – Electronic Warfare Range
- RAF Leeming – Adversary Air and foreign visitors
- Durham Tees – Draken adversary air
- RAF Waddington – ISTAR, visitors
- RAF Coningsby – Typhoon
- RAF Marham – F35
- RAF Lakenheath – USAFE F-15 and F-35

RAF flying bases are predominantly situated along the East of the country because of our World War 2 history; East Anglia and Lincolnshire are flat and are geographically closest to Germany. The USAF have 2 airbases in East Anglia, RAF Lakenheath is home to their Fast Jet (FJ) assets while RAF Mildenhall hosts their air-to-air refuelling (AAR) assets. Airbus A330 Voyager aircraft perform the AAR role for the RAF and are based at RAF Brize Norton in Oxfordshire. In order to satisfy this DP, the SUA should be situated somewhere on the Eastern side of the country.

The requirement for supersonic flight leads to further geographical requirements. The Military Aviation Authority (MAA) Regulatory Article 2310<sup>10</sup> has the following regulations for non-operational supersonic flight:

<sup>8</sup> Temporary Segregated Area (TSA) A defined volume of airspace normally under the jurisdiction of one aviation authority and temporarily segregated, by common agreement, for the specific use by another aviation authority and through which other traffic will not be allowed to transit. (EUROCONTROL Airspace Management (ASM) Handbook

<sup>9</sup> Managed danger area (MDA) A UK-specific term for a TSA, or part thereof, which are, predominantly, established over the high seas. MDAs are effectively military TSAs and the MABCC is the executive authority for managing the military’s use of said airspace. (CAP 740)

<sup>10</sup> <https://www.gov.uk/government/publications/regulatory-article-ra-2000-series-flying-regulations-fly>

*“In the UK FIR, all supersonic flights should be conducted over the sea . . . Aircraft Commanders should ensure their Aircraft is at least 10 nautical miles (nm) out to sea and along a line of flight at least 20° divergent from the mean line of the coast.”*

*“Supersonic flights with the Aircraft pointing towards the land, turning or flying parallel to the coast should take place at least 35 nm from the nearest coastline.”*

This requirement necessitates high seas airspace<sup>11</sup> which further meets the CAP 740 definition of a MDA as “a UK-specific term for a TSA, or part thereof, which are, predominantly, established over the high seas.”

**If military aircraft can air-to-air refuel (AAR) why does the training area need to be close to the home bases?**



Large Force Exercises will almost always be supported by tankers. Using the example of a RAF A330 tanker and a Typhoon fighter this paragraph will explain why the proposed training area must be close to the main operating bases.

**Figure 18 – Voyager refuelling Typhoon**

A Voyager can give around 132,000lbs of fuel away during one sortie and loiter for around 5 hours. A typical AAR event would see around 6,500lbs of fuel transferred at a rate of 1000lbs per minute, enough fuel for around 20 refuels. Planners always allow 10 minutes for the receiving aircraft to “join” the tanker. There is simply not enough time for all aircraft to AAR.

The F-35 and Typhoon aircraft have a fuel duration of approximately 1hr 45, dependant on weather/weapons load/diversions/min fuel etc. With limited or sometimes no refuelling assets available the training area needs to be close enough for aircraft to arrive, complete the serial and make it home again. In addition, because of the high-performance nature of the aircraft and training serials being flown, there is a higher probability of emergencies necessitating a landing at a diversion airfield. The East of the country has a higher number of potential diversions.

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<sup>11</sup> Airspace beyond land territory and territorial seas, as specified in the United Nations Convention on the Law of the Sea (Montego Bay, 1982. (Reg (EU) 923/2012 Article 2(86))



**DP(c)** Optimise the airspace design to accommodate periodic large-scale multi-domain collective training activities.

Within this DP there are a number of conditions which require definition.

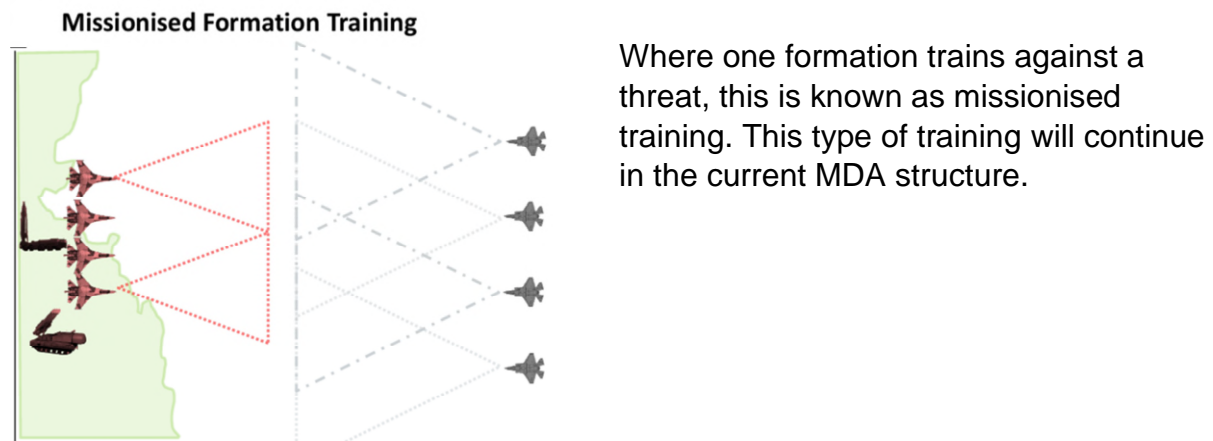
Periodic – The aim of this ACP **is not** to move all training away from existing MDAs. We propose that the new airspace would be used for the following exercises:

Exercise COBRA WARRIOR (~12-15 missions per exercise lasting up to 3 hrs per mission). Held twice a year.

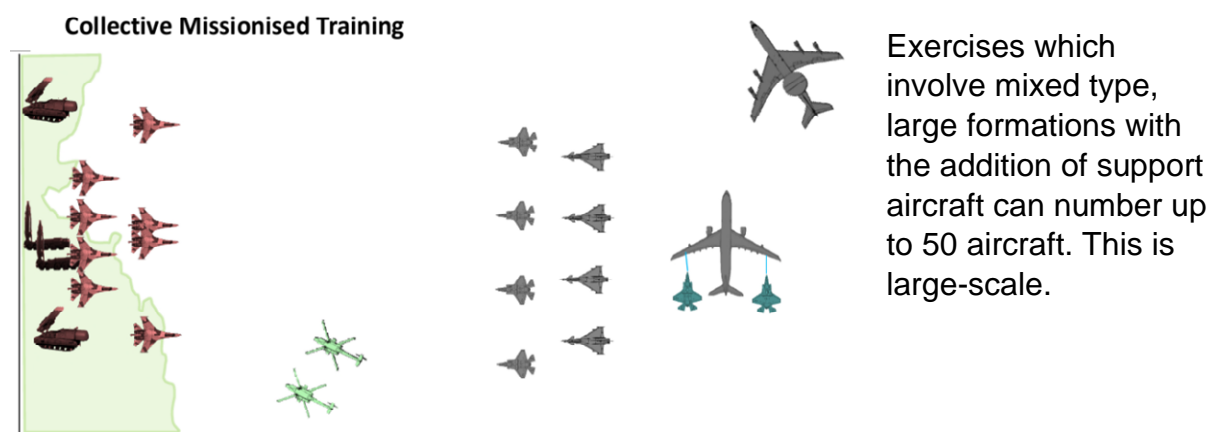
STORM WARRIOR (~6 missions lasting 3 hours each). Held twice a year.

RISING PANTHER is held 6 times per year, twice a month in Feb, June and Nov with 3 missions per exercise lasting 3 hours each.<sup>12</sup>

Large-scale –



**Figure 19 – missionised formation training**



**Figure 20 – collective missionised training**

<sup>12</sup> This is the current exercise schedule, not a long-term forecast and is subject to change.

Multi-domain – The traditional domains are air, land and maritime. To be a truly next-generational force and to train to operate against a technologically advanced adversary, the domains of space and cyber must also be included.

Collective training – See figure 17 above. Where Force Elements from the different Groups within the RAF along with allied and space capabilities train together with the goal of operating together against near-peer adversaries.

To facilitate this multi-domain collective training the airspace must be of the correct dimensions for the aircraft to operate as they would during peer-peer combat operations. For modern air systems this requires lateral dimensions of **160nm x 90nm**, vertical dimensions required are from **surface to FL660**. With segregated airspace from the surface, true multi-domain training involving surface and sub-surface vessels and an array of rotary wing and carrier-borne assets could be utilised. However, this would affect airports to an unacceptable level and also interrupt North Sea helicopter traffic.

To allow for the full tactical employment of aircraft and weapons capability and to counter threats from the ground as well as the air, it is important that the airspace is oriented so that the shorter edge of the 160nm x 90nm box is over land as in Figure 13.

**DP(d)** Optimise Airspace Management (ASM) applying Flexible Use of Airspace (FUA) principles and ASM Policy

CAP 740 describes the principle objective of ASM as achieving the most efficient use of the airspace through dynamic time-sharing and, at times, the segregation of airspace amongst various categories of airspace users on the basis of short-term needs. This proposal, although for a permanent change, would only seek activations of the SUA when training serials are occurring.

It is proposed that bookings, activations and de-activations should be managed through the Airspace Management Cell (AMC) and the Military Airspace Management Cell (MAMC) following booking requests from the MoD user.

Consideration must also be given to adjacent MDAs when activating this proposed SUA. In order to preserve airspace for GAT to FPL and allow for alternative routes and FRA, measures for the suppression of other MDAs could be introduced.

Following the principles of ASM policy and FUA will ensure that **DP(e)**, minimise impact on other airspace users and the network, is met. Additional measures to be implemented with detail to follow in stage 3 of the CAP 1616 process could include the addition of new Direct Tracks (DCT)s to circumnavigate the area and Flight Plan Buffer Zones (FBZ). A temporal buffer zone could also be implemented during activation and de-activation of the airspace.

**DP(f)** Minimise environmental impacts including noise (where relevant).

As previously discussed, most of the SUA would be situated over the sea and High Seas. In order to meet this DP this ACP will propose a base level of FL85. Engagement with stakeholders has identified that some routes will be affected during activations but published departure and arrival procedures will nevertheless be followed. **There is no anticipated change to traffic patterns below 7000’.**

**DP (g)** Minimise environmental impacts including CO2 emissions.

In accordance with CAP 1616 page 163 para B42, level M changes need only take into account the environmental impact of any changes to civil traffic patterns. The application of FUA principles would ensure that activations are for a short a time as necessary. In order to avoid lengthy re-routes as a result of activation, MoD could work with NATS to implement DCTs. This ACP seeks to position a new SUA in an area which will least affect civil routes. If necessary and proportional, as part of Stage 3 the sponsor will commission simulations to calculate, using WEBTAG the additional CO2 emissions caused by aircraft re-routing.

**DP(h)** Minimise the impact to Commercial Air Traffic flow, sector complexity and sector capacity.

This proposal aims to establish segregated airspace separated from commercial air routes temporally and laterally.

In addition to avoiding air routes, the proposed SUA seeks to avoid lower airspace structures such as TMAs and CTAs. It is hoped to maintain connections to airports and avoid the Oceanic flow, where existing routes are blocked, the creation of alternative routeing points could be investigated.

The SUA proposed in this ACP will seek to avoid those areas already saturated with upper and lower routes. Obvious areas to avoid being SE England, the spine of mainland UK and NW England. There are areas with fewer routes, these being W Scotland, Wales, SW England, E Anglia and NE England.

### **Free Route Airspace (FRA)**

Although the sponsor aims to have minimal impact on existing airspace structures, the advent of FRA requires consideration as the impact of this change is not yet fully known, however, when active, the proposed SUA is likely to close a number of waypoints resulting in longer routes. The concept of FRA allows aircraft to flightplan and fly between waypoints and not be constrained to follow the current network of routes. FRA in the Scottish FIR is imminent and the position of OFCOT could be used to design the Northern extremity of the SUA, leaving an anchor point for FRA.

**DP (i)** Optimise protocols for deconfliction of simultaneous activations of multiple volumes of Special Use Airspace.

Protocols could be agreed restricting activations of multiple volumes of SUA and enable GAT to FPL and operate along Conditional Routes (CDRs), Free Route Airspace and notified DCTs. MAMC would continue to co-ordinate and prioritise requests, including for this proposed SUA, should it be approved.

**DP (j)** Minimise complexity in flight planning.

The proposal should comply with ASM protocols and SUA activations are normally via NOTAM. The consideration for the use of temporal buffer zones would ensure that FPLs would not be affected by short notice activations or de-activations. In order to provide a route for GA to route around the SUA when active, conditional routes and notified DCTs could be designed.

**DP (k)** Maximise the incorporation of results of the MOD's supporting Airspace trial – ACP-2020-042.

This proposal has its roots in the trial ACP-2020-042, completed previously using airspace in the NE of England. Feedback from the trial activation would be consulted as necessary.

## Design options summary

Table 2 below summarises the list of design options considered. Although there is only one proposal alongside the do nothing option, the sponsor has considered and eliminated a number of options which have not made it to this list. These are described in the next section. The “do-nothing” option is described for use as a baseline and is not considered by the sponsor to be the preferred course of action.

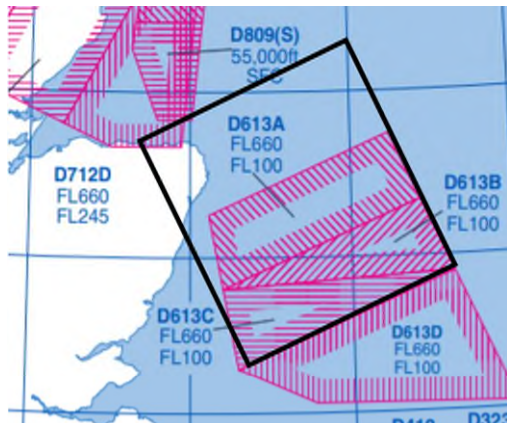
	Option	Description
0	Baseline	The “do nothing” option. Keep everything as it is currently, continue to use existing MDAs. Large Force Exercises will still take place but use MDAs and existing Class G/C airspace.
1	Create new SUA with overland portion.	Create new Special Use Area, predominantly positioned in high seas airspace with overland portions on which ground threats and targets can be positioned.

**Table 2. Design Options Summary**

## Eliminated Options

Use of existing MDAs will be discussed later in the document under the “do-nothing” heading. However, the sponsor did investigate expansion of other existing MDAs and Military Training Areas (MTAs), a summary of these follows. For each eliminated option an accompanying short narrative will explain why it was rejected and a table will show which DPs were met or not met.

### Eliminated Option 1 - Expand D613 to include an overland portion.



The existing D613 complex has no overland portion. By extending it Northwest a fillet of Eastern Scotland can be used to locate ground based threats. However, the orientation is not suitable for LFEs. Geographically convenient for RAF Lossiemouth, it is too far from the main E Anglian bases and would potentially cause disruption to P600 and Y906.

Figure 21 - Illustration of option to expand D613

DP not met	Reason
B	Too far from main operating bases.
C	Airspace design not correct orientation.
E	Disruption to key air routes.
H	Disruption to key air routes.
K	Doesn't incorporate findings of ACP-2020-042

### Eliminated Option 2 – Re-orientate North Wales Military Training Area (NWMTA)



Figure 22 Expanded NWMTA

Much of the NWMTA is situated outside of the ATS route structure. Its current orientation isn't suitable for LFE and there is insufficient high seas airspace for supersonic flight. Although there is a large choice of locations on which to position ground based threats, the orientation would have to be rotated through 90 degrees to be useful, thus imposing on Irish Sea ATS routes. In addition, there is a lack of diversion airfields and, more importantly, exercise participants would have to cross the

busy ATS routes situated up the spine of the country.

DP not met	Reason
B	Too far from main operating bases.
C	Airspace design not correct orientation.
E	Disruption to key air routes.
H	Disruption to key air routes.
K	Doesn't incorporate findings of ACP-2020-042

### Eliminated Option 3 – Expand East Anglia Military Training Area (EAMTA)

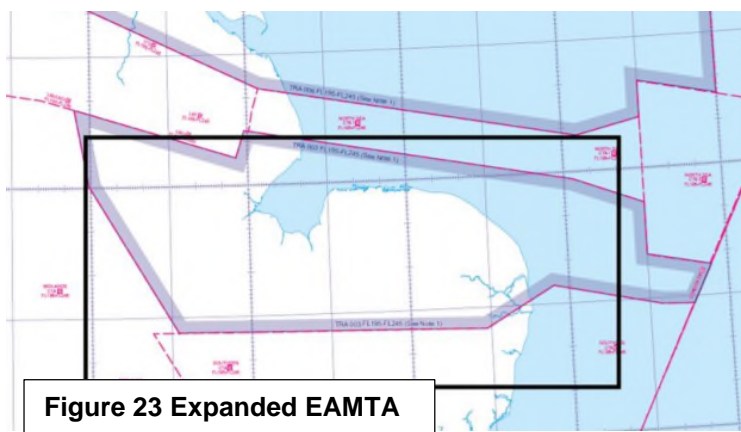


Figure 23 Expanded EAMTA

Although geographically the EAMTA is well situated for the RAF bases, it is of the wrong dimensions to support LFEs. An expansion to the required dimensions would still result in a lack of airspace over the sea for supersonic flight and severely disrupt Norwich Airport's operations and a number of UAS routes.

DP not met	Reason
E	Disruption to key air routes.
H	Disruption to key air routes.
K	Doesn't incorporate findings of ACP-2020-042

### Eliminated Option 4 – Use D064

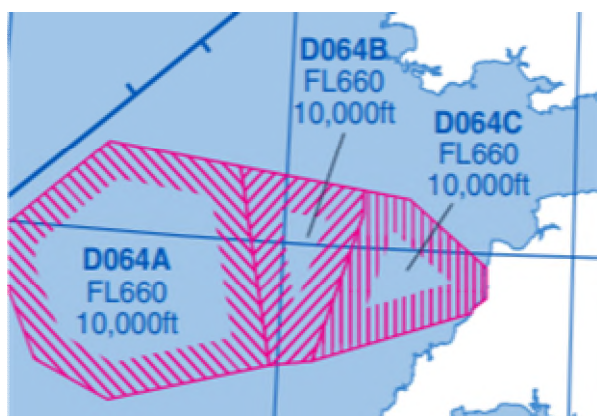


Figure 24 – D064

The EG D064 complex, at first glance appears to be a potential solution. Lateral and vertical dimensions are good and there is an overland portion. However, the lack of available diversions and the sheer distance from the main RAF bases precludes this from consideration. In addition, all exercise participants would have to cross busy airspace in order to reach the area. A host of UAS ATS routes would also be affected.

DP not met	Reason
B	Too far from main operating bases.
C	Airspace design not correct orientation.
E	Disruption to key air routes.

H	Disruption to key air routes.
K	Doesn't incorporate findings of ACP-2020-042

### Eliminated option 5 – Corridor through SUA

In order for Newcastle traffic to route DCT CUTEL the inclusion of a corridor at a suitable FL was considered. The benefits would be environmental and financial, reducing the effect caused by activations to GAT. However, due to the activities taking place within the SUA, in particular high-energy manoeuvres and Electronic Warfare serials, this is considered unsafe and would limit the training serials.

DP not met	Reason
A	Would introduce risk of MAC
C	Would restrict the activity within the SUA

### Next steps

An initial options appraisal (2b) will be available on the CAA airspace change portal and includes a comparison of the proposal against a “do-nothing” option. It should be noted that the do-nothing option is expressed purely for comparison against the baseline and will not be progressed under this ACP.

Engagement has taken place during this stage in order to assess how the design options have responded to the design principles. This initial feedback is detailed below and has helped to shape this proposal; it will form the basis for ongoing consultation during stage 3. Those stakeholders with whom much more consultation will be pursued are Newcastle Airport, NATS and 78 Sqn. In addition the sponsor will continue to keep open those channels of communication already established and will be proactive in identifying new stakeholders not already engaged and is prepared to adapt the proposal as a result of this consultation.

During stage 3 the sponsor will approach external agencies to provide data relating to fuel burn and emissions. We will commission models to predict traffic flow and determine the shape of the SUA. Further consultation will take place with affected stakeholders to see if agreements can be reached on activation times. In addition we will analyse the feedback from temporary activations of TDA EG 597 to see what lessons can be carried across to this ACP.

It is acknowledged that this proposal will require increased sharing of the finite resource which is airspace and it may not be possible to reach a solution to the satisfaction of all airspace users.

This stakeholder engagement will be submitted to the portal as part of the CAP 1616 Stage 2 process.

## Stakeholder feedback

This is a record of all stakeholder feedback. That which occurred after the CAA guidance meeting on 19<sup>th</sup> Oct is highlighted in blue.

Participating stakeholder	Engagement date and media	Discussion/decision	How has this influenced this version of the ACP?
Edinburgh International Airport (EAL)	Email 13 Aug 21	<p>EAL questioned how the SUA would be activated. They explained that track mileage and therefore CO2 would increase as a result of aircraft routeing around the airspace. They are updating the PRNAV SIDs and approaches and requested assurances that activation would be infrequent and co-ordinated with NATS. They also noted that the trial ACP-2020-042 took place during reduced traffic levels therefore weren't a reliable indicator.</p> <p>I replied with the expected cadence of activations but stressed that this wasn't a guarantee. I explained that the airspace should be activated by the MAMC in accordance with the AUP with a corresponding FBZ.</p>	<p>Page 14 of this document explaining how DP (d) and DP (e) could be met explains the activation process for this airspace. In Stage 3, simulations have to be produced to determine the potential number of aircraft which could be affected. The results would then calculate extra track mileage, fuel burn and CO2 emissions.</p> <p>It is proposed that all activations would be in accordance with a Letter of Agreement with NATS and should be co-ordinated by the Military Airspace Management Cell.</p> <p>The cadence of activations is specified in DP (c) with the definition in terms of this ACP of periodic. We propose that the new airspace be used for the following exercises:            Exercise COBRA WARRIOR (~9-15 missions per exercise lasting up to 3 hrs per mission).            STORM WARRIOR (~6 missions lasting 3 hours each).            RISING PANTHER is held 6 times per year, twice a month in Feb, June and Nov with 3 missions per exercise lasting 3 hours each.</p>
Newcastle International Airport (NIA)	Email dated 16 Aug 21	<p>NIA do not believe the options align with the design principles and feel that the change would impact on their operation, traffic patterns and safety. They feel that engagement thus far has been insignificant despite substantial concerns. Routing around the airspace would cause additional costs for airlines and increase CO2. Route viability would be reduced therefore inhibiting economic prosperity in the region. Proposal includes larger overland area. Exercise traffic frequently manoeuvres outside the segregated airspace impacting on safety and NIA traffic. Concerned about the impact to the community of increased traffic levels.</p> <p>I responded to this and gave them evidence that their feedback resulted in changes to the design principles. I sent a prediction of the activation frequency and stressed</p>	<p>Newcastle have re-iterated their concerns about the impact on their operation, traffic patterns and safety. The sponsor will visit Newcastle Airport in December 2021 for face to face meetings. In answer to their specific concerns, this document clarifies the following.</p> <p>Page 14 of this document explaining how DP (d) and DP (e) will be met explains the proposed activation process for this airspace. In Stage 3, simulations have to be produced to determine the potential number of aircraft which could be affected. The results would then calculate extra track mileage, fuel burn and CO2 emissions.</p> <p>The impact to the community of increased traffic levels will be assessed qualitatively in stage 3 and this analysis is a requirement of the CAP 1616 process.</p> <p>Options to provide an ATS to Newcastle inbounds and outbounds should be investigated during Stage 3.</p>



	<p>Face to face meeting 3<sup>rd</sup> December 21</p> <p>E-mail 20 Jan 22</p>	<p>that D597 will again be activated in September 21 after which the sponsors of this ACP and ACP-2021-007 would arrange a face to face meeting. At this meeting it is hoped that a process for deconfliction can be agreed between the exercise activations and NIA schedule.</p> <p>NIA concerned that unpredictability in activations will affect their business. In addition they predict higher levels of unnotified transit traffic.</p> <p>Newcastle asked about the possibility of shorter activations.</p>	<p>With regards to exercise traffic spilling outside of the SUA, again evidence will be gathered during temporary activations to assess whether this is a safety concern. It is proposed that the SUA is designed large enough to accommodate all exercise traffic. Larger, slower aircraft not executing high energy manoeuvres may fly in orbits outside the SUA but inside Class G airspace.</p> <p><b>MoD proposes that the SUA does not impose on the Newcastle CTA. In addition, CTAs of all other airports should be avoided. In addition, the design should allow a route to ensure the airports remain connected to the route network.</b></p> <p>Protocols and notification periods were agreed. Minutes can be found at <a href="#">this link</a></p> <p>Initial response from the sponsor is that shorter activations would require more activations. With the addition of a FBZ this would disproportionately increase the total activation time required for the same VUL period and increase the fuel used by mil aircraft participating in the Ex.</p> <p><a href="#">Offered to address during Stage 3.</a></p>
NATS	<p>Email dated 11 Aug 21</p> <p>Teams meeting 20 Aug 21</p>	<p>NATS asked for confirmation that arrangements would be made for the routing of traffic to avoid the SUA. They also sought clarity on the frequency of activations in order to minimise disruption to other users. They raised the point that low traffic levels have resulted in trials being not as meaningful. Concern was raised over the effect to Newcastle Airport. It was asked whether a CTA would be implemented or whether 78Sqn would provide ATS. They sought clarification on the suppression of EGD323, 613, 513, 412 and FJ areas during activations.</p> <p>Teams meeting. MOD will work with NATS to implement new routes and buffer zones. If the preferred option is selected, FBZ and new routes have already been made. Activations would be advertised in advance and managed by MAMC, 2 major and 6 small exercises pa. NATS were asked to support the ACP through modelling using expected traffic levels and to work with all agencies for a solution to control Newcastle outbounds. Newcastle have</p>	<p>In response, this ACP proposes the following conditions. Where the proposed SUA interrupts the ATS route structure, MoD should work with NATS to implement new routes and FBZ.</p> <p>All activations should be in accordance with a Letter of Agreement with NATS and should be co-ordinated by the Military Airspace Management Cell.</p> <p>One possible solution could be for Swanwick Mil to provide ATS to aircraft in/outbound from Newcastle with evidence harvested from temporary activations to assess whether their operations are affected.</p> <p>In accordance with DP(d). The sponsor should take measures to ensure that, where necessary, agreements are in place to suppress other MDAs and FJ areas in order to allow GAT to FPL and operate along Conditional Routes (CDRs) and Free Route Airspace (FRA).</p> <p>The cadence of activations is specified in DP (c) with the definition in terms of this ACP of periodic. We propose that the new airspace will be used for the following exercises:</p>

	Teams Meeting 25 Nov 21	<p>representation during the process and will have at length consultation. 78 Sqn have already stated that a CTA is the preferred option, this will be discussed during stage 3, Newcastle will want a guarantee of an ATS provision.</p> <p>NATS stressed that the design of D597 makes provisions for key ATS routes and avoids TMAs and CTAs, it also provides for FRA. They encouraged the use of data from trial activation ACP-2020-042 and temporary activation ACP-2021-007 to be the primary source of information to justify any design.</p>	<p>Exercise COBRA WARRIOR (~9-15 missions per exercise lasting up to 3 hrs per mission).</p> <p>STORM WARRIOR (~6 missions lasting 3 hours each).</p> <p>RISING PANTHER is held 6 times per year, twice a month in Feb, June and Nov with 3 missions per exercise lasting 3 hours each.</p>
BAE Systems Warton	Email 27 Jul 21	<p>This stakeholder questioned whether the change in airspace construct would result in higher incidences of military traffic or GAT routing over the Irish Sea. They also asked whether the staffing issues experienced by 78Sqn have been resolved.</p> <p>In reply I stated that the airspace for the preferred option had been trialled once already with a further activation during September 21. I have asked the sponsor of ACP-2021-07 to include BAE when asking for feedback from the temporary activation.</p>	<p>There is no evidence that there would be an increase in traffic levels over the Irish Sea as a result of this proposal or as a result of previous D597 activations.</p>
British Gliding Association	Email 6 Aug 21	<p>Both the BGA and Borders Gliding Club expressed concern that their activities would be limited during any activation. These will need to be notified in advance, 92 Sqn are willing to implement a process for this.</p>	<p>In light of this feedback, MoD propose a base of FL85 so that limited gliding operations can continue.</p> <p>A procedure should be implemented to ensure the Exercise operating authority advertises times and dates in advance and continues this good relationship.</p>
ISTAR Force HQ	Email 16 Aug 21	<p>Requested clarification of the geographical areas and FLs of the proposed SUA. They also asked whether other LFAs would be used concurrently with the new SUA. Clarification of the proposed dimensions was passed along with the routing options being used during the temporary activation.</p> <p>There is a separate ACP in progress for RPAS, I have requested a meeting with the sponsor in order to assess whether there are any conflicts.</p>	<p>MoD proposes that other MDAs should be suppressed with the new SUA being given priority due to this only being activated for high-importance Large Force Exercises. Fast Jet Areas should be suppressed but LFAs could still be available.</p>

Internal MOD stakeholders including Leuchars airfield, Battlespace Management Force HQ and Flying Trg Schools (FTS)	Various emails	Leuchars acknowledge a choke point may be created and QRA might have to transit through the active area. Procedures for priority ac to transit will be addressed and included as part of the process. BMFHQ preferred option 3 and provided DASOR evidence backing the creation of a SUA as opposed to the CACA concept previously trialled. FTS requested clarification on the proposed base levels and anticipated number of activations, this was provided.	Although the proposed SUA would be impermeable, a LOA could be written and would include actions on QRA or aircraft in an emergency entering the airspace.
General Aviation Alliance	Email 9 Sep 21	<p>GAA asked questions specifically regarding method, frequency and timeliness of activation. They asked how traffic would be re-routed and expressed surprise at the lack of GA input into ACP-2020-042.</p> <p>The sponsor replied with the expected cadence of activations and confirmed that it would be activated by NOTAM but also expressed an intention to investigate whether &gt;24hrs notice could be routinely given. Arrangements used in ACP-2021-007 were outlined as good practice to take forward for this ACP, FBZ and reporting points. The stakeholder was directed to ACP-2021-007 and encouraged to offer feedback to the temporary activation.</p>	Nothing further to add.
Dundee Airport	Email 28 Jan 22	<p>The airspace around Dundee is already very restrictive and we handle large quantities of business aviation, schedule traffic and offshore instrument training in addition to a busy flight training school.</p> <ol style="list-style-type: none"> <li>1. Possible conflict when the DND hold is active at higher levels.</li> <li>2. Potential TCAS/AIRPROX issues with RW09 departures and aircraft in the hold with military aircraft conducting high energy manoeuvres. I</li> <li>3. Parachute activity at Leuchars and D604 already impact Dundee operations. This may impact RNP approaches further.</li> <li>4. Additional level restrictions passed on departure instructions increasing the risk of level busts.</li> <li>5. Extended routing for arrivals departures, in turn more fuel burn and greater CO2 emissions. A substantial number of our aircraft require routeing East or South East via SAB/NATEB</li> </ol>	<p>The stakeholder was invited to a Teams meeting to discuss their concerns but no response was received at the time of writing. The sponsor's response to the issues are:</p> <ol style="list-style-type: none"> <li>1. The base level is proposed at FL85 to minimise conflict with the DND hold.</li> <li>2. Segregated airspace will reduce the chances of an airprox. Any TCAS events should be reported.</li> <li>3. Investigation required during Stage 3 to assess the impact and number of aircraft affected.</li> <li>4. Level restrictions are a tool to ensure the aircraft doesn't bust CAS. A level bust could occur following a restriction for any reason. This ACP doesn't increase the chance that a pilot will fail to follow a safety instruction. CAP 413 provides phraseology.</li> <li>5. Yes, longer route required. What number of aircraft is "substantial"?</li> <li>6. The activations would be for short, pre-notified periods with no late-notice changes permitted.</li> </ol>

		6. Exercise takes place during our busiest periods, increased number of business jets operating in and out of Dundee.	
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## Summary

The definition of a Danger Area is “Airspace of defined dimensions within which activities dangerous to the flight of aircraft may exist at specified times”. A Managed Danger Area (MDA) is a UK-specific term for a TSA, or part thereof, which are, predominantly, established over the high seas.

We believe that the option detailed in this document satisfies the statement of need and aligns with the design principles. The CAP 1616 requires that a comprehensive list of options is presented at this stage, if a list is possible. By describing those options already eliminated the sponsor has demonstrated that a host of options have been explored and eliminated as they do not align with the design principles.

The role of the Royal Air Force is to deliver air and space power to protect the nation. Without the option to re-shape Danger Areas to satisfy clear training requirements, the RAF would not be able to meet its key deliverables of having Force Elements at Readiness nor would it be able to meet its air commitments to NATO.

Our purpose in the Ministry of Defence is to protect the people of the United Kingdom and our overseas territories, prevent conflict, and be ready to fight our enemies. The importance of suitable airspace in which to conduct flying training cannot be overstated.