

Ministry of Defence

Modernising Airspace

Options Appraisal (Phase III)

Development of North Sea Airspace for Military Training

Stage 4A Update and Submit

## Publication History

Version	Month / Year	Change Requests in this Issue
Issue 1.0	Sep 18	Submitted to the CAA for publication

## References

	Description	Hyperlinks
1	Stage 1a Assessment Meeting Presentation	<a href="#">LINK</a>
2	Stage 1a Assessment Meeting Minutes	<a href="#">LINK</a>
3	Stage 1b Design Principles	<a href="#">LINK</a>
4	Stage 2a Airspace Change Design Options	<a href="#">LINK</a>
5	Stage 2a Design Principle Evaluation	<a href="#">LINK</a>
6	Stage 2b Options Appraisal (Phase 1 – Initial)	<a href="#">LINK</a>
7	Stage 3 Consultation Strategy	<a href="#">LINK</a>
8	Stage 3 Options Appraisal	<a href="#">LINK</a>
9	Stage 3 Consultation Document	<a href="#">LINK</a>
10	Stage 3 Collate and Review Responses	

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## 1. Introduction

It is widely reported that the UK airspace is congested and commercial air transport flights are increasing globally year on year; the Future Airspace Strategy has been established to ensure developments take place that increase the capacity of the network, reduce delays and improve the efficiency of flight paths. Military aviation activities are also expected to grow significantly between 2019 and 2025, driven principally by the increase in numbers of existing platforms (Typhoon) and the introduction of new aircraft (for example F35 Lightning). The operation of modern combat aircraft with their longer-range sensors and weapon systems also requires larger volumes of airspace in which to train and become proficient.

## 2. Statement of Need

In SDSR 2015, the Government committed the UK to increasing the number of combat aircraft that the MOD will operate and confirmed the intention to buy 5th generation fast jets. Additionally, as its NATO ally, the US Government has committed to the continued basing of combat aircraft within the UK. Resultantly, there is a projected growth of more capable combat aircraft planned to operate within the UK. To support this Government-directed expansion in military capability, there is a requirement for a larger area of segregated airspace to accommodate training requirements and thus ensure operational capability.

In Jan 19, the UK airspace infrastructure will be much the same as today i.e. fixed route networks and airspace structures; as such, the initial airspace development proposed here is potentially a first phase temporary solution to support MOD needs and may need updating as UK modernises airspace and future military requirements emerge. In addition to the Airspace Design other ongoing work is expected to improve processes, protocols and priorities for ASM which are projected to enhance the effectiveness of the airspace development. This includes:

- Improved usage performance against ARES bookings.
- Enhanced processes to allow increased CDM in accordance with agreed protocols.
- Wider utilisation of ASM tools to improve the transparency and visibility of the booking process.

FUA concepts for how the airspace can be modularised to meet the needs of multiple users, as well as minimising the impact on the civil airspace network will be utilised.

It is intended to introduce the new airspace as soon as possible in 2019. This proposal may be supported by airspace management trials and if required airspace design trials.

## 3. Design Principles

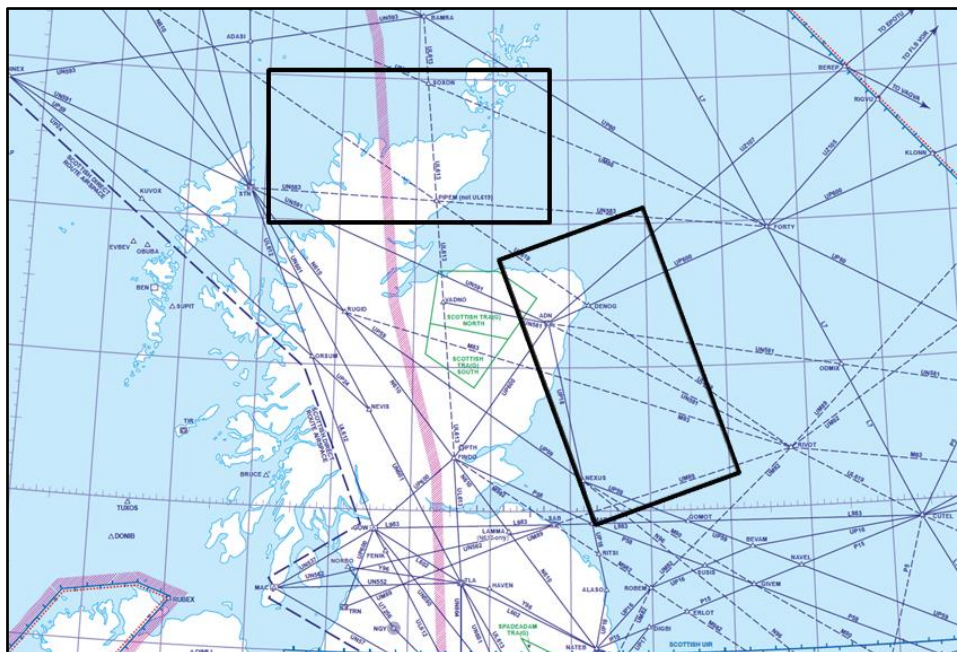
1. The training area will be within reach of UK/USAFE Main Operating Bases.
2. The design will provide a suitable training area.
3. The design will provide a sufficient overland portion for siting land based assets (Training Requirement).
4. Safety – apply current airspace design safety parameters e.g. buffer policy. Final solution Tolerable and ALARP (Safety).
5. Management of airspace to utilise FUA principles (Efficiency + Airspace Sharing).
6. Minimise impact upon the network where possible (Efficiency + Airspace Sharing).
7. Simplicity - utilise existing structures where possible (Efficiency, Simplicity + Safety).

8. Conformity – use standard airspace structures where possible (Simplicity + Safety).
9. Minimise impact upon any other airspace users.

#### 4. Potential Geographical Locations

The UK is a relatively small but densely populated island with a well-developed commercial aviation sector. As such, much of the UK landmass is already heavily utilised by commercial aviation, particularly in the vicinity of highly populated areas. The minimum sized area for routine training has been determined by the Combat Air authorities as a portion of airspace 120nm x 60nm with an overland portion to facilitate training against land based facilities. The geographical locations that could potentially meet the airspace requirement without a significant and hence potentially unfeasible impact on routes into and out of commercial airports are limited. Potential locations, some of which are already utilised by the military are:

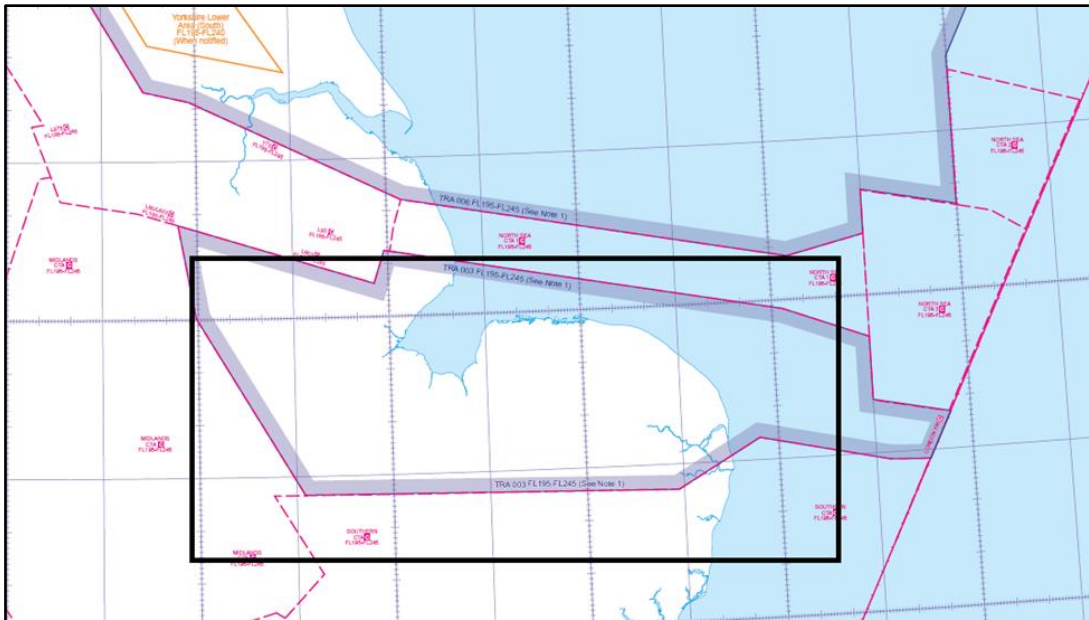
- a. North-West Scotland – creating airspace to the north or north west of Scotland.
- b. North and North-East Scotland – building upon EG613 and adding overland portion.



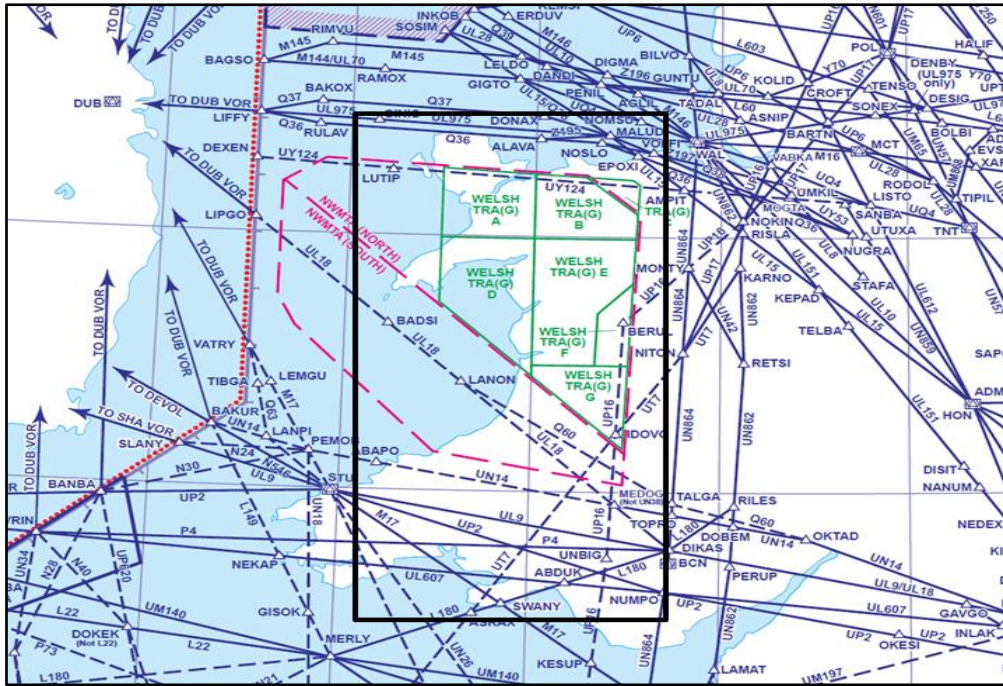
- c. Yorkshire/North Sea – Building on EG323 and adding overland portion.



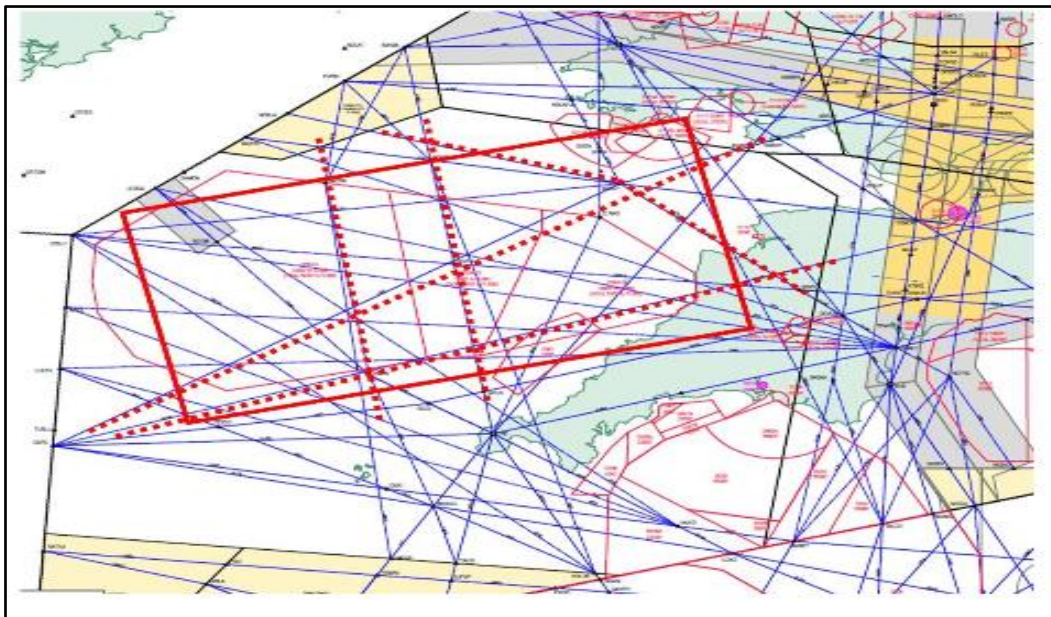
d. East Anglia – enlarging the EAMTA



e. Mid-Wales and Irish Sea utilising EG201 and NWMTA



f. South-West peninsular – building on D064 and adding overland element.

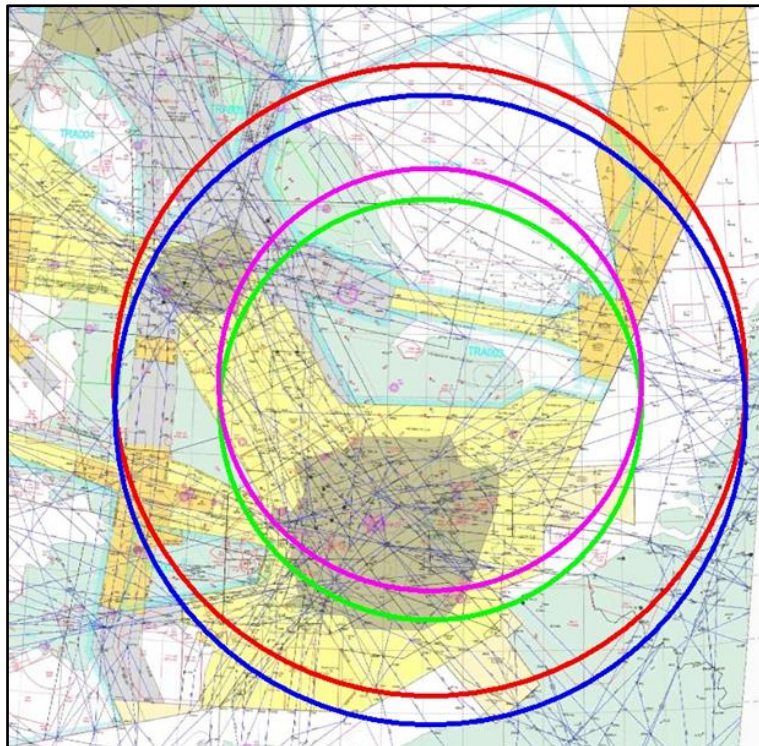


All of these options would require the establishment or expansion of a segregated airspace structure that will impact the network to some extent.

#### 4.1 Geographical Constraints

In addition to identifying geographical locations that meet the airspace requirements, any chosen location must satisfy the constraint presented by the Design Principle that requires the area to be within reach of UK/USAFE Main Operating Bases. Two of the Main Operating Bases that will routinely use the area are RAF Marham and RAF Lakenheath. Routine training flights will not have tanker support so in order for training time to be maximised and training

requirements met, transit time to and from the training area will need to be minimised. Fig 1 below is an extract from an initial airspace requirements paper. It shows the 100nm and 150nm radii from RAF Marham and RAF Lakenheath and gives a good indication of that airspace that is within reach for routine training.



## 5. Options Appraisal

When tested against the Design Principles the location with the best fit, indeed the only feasible option, without a major redevelopment of UK airspace, was to expand EG D323 in the North Sea. This option achieved the essential requirements of being within reach of RAF/USAFE operating bases, providing airspace that had an overland portion, and was of sufficient size to permit meaningful training. It utilised existing airspace structures and is comparatively simple when compared against a significant redevelopment. There is an impact to the network and potentially some other airspace users, which will be mitigated by the use of Airspace Management protocols and Flexible Use of Airspace principles. Given the lack of geographical options and once military requirement has been met, other than safety, the need to minimise impact of the network has driven development. Hence rather than a series of options, there has been, through collaboration and negotiations between the MOD and NATS, a series of modifications to the design – thus the process has been highly iterative.

Two appraisal forms have been completed comparing the proposed North Sea design with the 'Do Nothing' baseline. As can be seen from the forms below, the 'Do Nothing' option does not meet the airspace requirements to facilitate Government directed force generation of Combat Air. As such the 'Do Nothing' option is discounted and the proposed design put forward as the preferred option.

### 5.1 Preferred North Sea Option

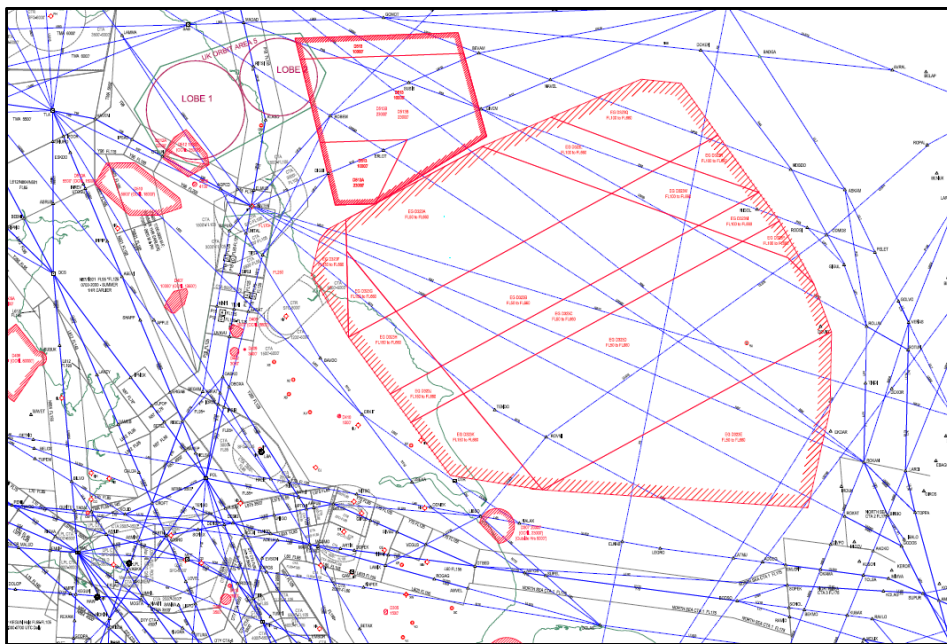


Expand EG D323	<b>ACCEPT</b>		
<b>Description of Option</b>			
This option is the only viable geographical location and builds on existing airspace structures of EG D323 to provide a suitable portion of segregated airspace for training.			
<b>Design Principle 1:</b> The training area will be within reach of UK/USAFE Main Operating Bases.	NOT MET	PARTIAL	MET
Option within reach of RAF Marham, RAF Lakenheath & RAF Coningsby.			
<b>Design Principle 2:</b> The design will provide a suitable training area.	NOT MET	PARTIAL	MET
The design option provides the minimum 120nm x 60nm area for routine training and provides sub-divisions that will ensure that segregated airspace is used efficiently.			
<b>Design Principle 3:</b> The design will provide a sufficient overland portion for siting land based assets.	NOT MET	PARTIAL	MET
The design provides for land based assets to be sited below segregated airspace.			
<b>Design Principle 4:</b> Safety – apply current airspace design safety parameters e.g. buffer policy. Final solution Tolerable and ALARP.	NOT MET	PARTIAL	MET
Any risks posed by the option have been initially assessed as being ALARP and the option will be subject to full safety assessment.			
<b>Design Principle 5:</b> Management of airspace to utilise FUA principles.	NOT MET	PARTIAL	MET
Through the use of sub-divisions and by management through the MABCC FUA principles are designed in. Moreover, the intention is to bring in improved Level 3 management which will benefit both civil and military airspace users.			
<b>Design Principle 6:</b> Minimise impact upon the network where possible.	NOT MET	PARTIAL	MET
There will be some residual impact upon the network, although this is mitigated to the absolute minimum possible by designing in additional routes and through agreed airspace management protocols.			
<b>Design Principle 7:</b> Simplicity - utilise existing structures where possible.	NOT MET	PARTIAL	MET
The design builds upon an already existing segregated airspace structure.			
<b>Design Principle 8:</b> Conformity – use standard airspace structures where possible.	NOT MET	PARTIAL	MET
All airspace design features are standard for the UK.			
<b>Design Principle 9:</b> Minimise impact upon any other airspace users.	NOT MET	PARTIAL	MET
There is some impact to other MOD airspace users, such as AEW Orbit Area 4 and there may be some impact to aircraft routing off route or above FL100 along the Yorkshire coast.			

## 5.2 Do Nothing Option

Do Nothing	<b>REJECT</b>		
<b>Description of Option</b>			
This option does not change airspace structures and requires Combat Air aircraft to use.			
<b>Design Principle 1:</b> The training area will be within reach of UK/USAFE Main Operating Bases.	NOT MET	PARTIAL	MET
EG D323 is within reach of RAF Marham, RAF Lakenheath & RAF Coningsby.			
<b>Design Principle 2:</b> The design will provide a suitable training area.	NOT MET	PARTIAL	MET
Airspace not large enough for routine training.			
<b>Design Principle 3:</b> The design will provide a sufficient overland portion for siting land based assets.	NOT MET	PARTIAL	MET
No overland training area.			
<b>Design Principle 4:</b> Safety – apply current airspace design safety parameters e.g. buffer policy. Final solution Tolerable and ALARP.	NOT MET	PARTIAL	MET
Current situation already ALARP.			
<b>Design Principle 5:</b> Management of airspace to utilise FUA principles.	NOT MET	PARTIAL	MET
There is already some FUA applied, but not the enhanced Level 3 management that the new design would utilise for both this area and other segregated airspace.			
<b>Design Principle 6:</b> Minimise impact upon the network where possible.	NOT MET	PARTIAL	MET
Impact upon network not changed.			
<b>Design Principle 7:</b> Simplicity - utilise existing structures where possible.	NOT MET	PARTIAL	MET
Airspace structure not changed.			
<b>Design Principle 8:</b> Conformity – use standard airspace structures where possible.	NOT MET	PARTIAL	MET
No change to airspace structures.			
<b>Design Principle 9:</b> Minimise impact upon any other airspace users.	NOT MET	PARTIAL	MET
No change.			

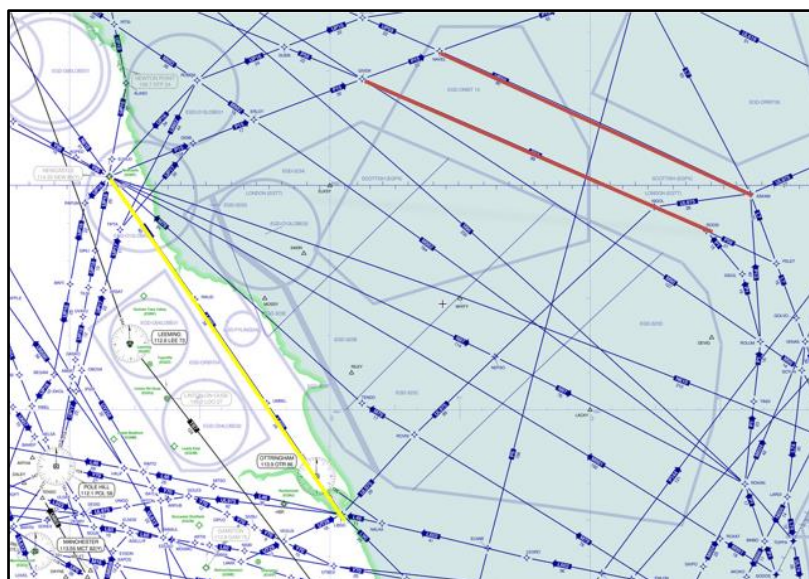
### 5.3 Proposed Design



Activation will be via the MABCC at D-1 and published times by NOTAM. It will be available for utilisation Monday – Friday, 24 hours a day, excluding weekends and Public Holidays.

The upper limit booked (of all areas) will be only that required for the training sortie. For the overland areas, F, G, H, J and K, the base level is designed at FL150. The normal configuration will be for areas to be booked with the published base levels, as this is deemed the least complex mode to operate in. However, in accordance with FUA principles the base levels remain available to be booked at variable levels should that be deemed to be most efficient. The Danger Area has been sub-divided to permit Airspace Management sharing agreements to be implemented and to enable military aircraft to book just the lateral size of airspace required. This frees up airspace for other users.

#### 5.4 Structures and Routes



The proposal also introduces several upper air routes above FL245 to ensure that civil traffic can continue to flow when the whole or parts of the Danger Area are active. As can be seen above, several Civil Air Routes shown in blue interact with the Danger Area and are available through Flight Planning or tactically when the Danger Area is not active. Of interest to this ACP are Air routes P58 and P59, in red, to the North-East of EGD323 which are used primarily for traffic routing to/from Europe to North America. They are also used by traffic routing to/from Europe to Iceland. L602, shown in yellow, to the west of EGD323 is used by both overflight traffic and traffic routing into and out of the Scottish Terminal Manoeuvring Area. All 3 of these routes are FL245 and above.

To accommodate traffic when Areas L, M, N, P, Q, R are active 2 new routes (including the newly created five letter reporting points) are proposed:

**N44:** GIGUL – ODMUS – NOBDO – DOKEN

**N66:** AVRAL – BADGA – DOKEN – GOMOT

As seen in the image below Conditional Route L975 will be also be slightly re-routed.

To facilitate the activation of Areas F, G, H, J, K which conflict with L602, it is proposed to re-route L602 and establish a new air route N110:

**L602 Conditional Route:** OTR – ERKIT

**L602:** ERKIT – TLA

**N110:** DOLAS – ABTOS – ODNEK – USEKA – ERKIT – BAVDO – UNTAL – AGPED – LAMMA

## 6. Consultation Feedback

The MOD completed a seven-week consultation on the proposed airspace. A total of 39 airlines, NATS, BGA, GA, several airports and a range of other agencies were engaged and targeted for this consultation. The consultation commenced on Monday 30 July 2018 and initially ended on Monday 10 September 2018; a period of six weeks. Following a request from one of the airlines, the period was extended to the end of the day on Friday 14 September 2018. A total of 18 responses were received during this period. A full summary of how the consultation was run and a theming of all responses can be found in Ref 10.

Response ID	Comment	Concern	Impact to the Proposal	Any relevant Considerations / Feedback
1	Airspace areas are already over complicated with lateral boundaries. Vertical boundaries add to this. Variable vertical boundaries would give much scope for errors.	Variable Base Levels	Varying the base level of the overland portion was considered to maximise FUA. The base level of the overland portion has been raised to FL150. These areas are activated by NOTAM so the base level can be variable although the <b>norm</b> will be to	The current design still proposes three differing base levels; FL150 over land; FL50 over the main body of the DA (wholly over the sea) and FL100 in the far-easterly portions. The normal configuration will be for areas to be booked with these base levels, this is deemed as the least complex mode to operate in. However, in accordance with FUA principles the

			activate to FL150.	base levels remain available to be book at variable levels should that be deemed to be most efficient.
3	Direct co-ordination with ATC at DTVA should be executed when area's F, G, H, and J are activated and de-activated.	Increase risk of Loss of Separation against Military against leaving segregated airspace	Nil.	The MOD have agreed that Military aircraft leaving the overland portion of the new airspace (F-K) will be in receipt of an ATS.
4	Helpline number to advise as to current status so that GA pilots can quickly check as to activity	Awareness of DA activity	Nil.	Pilots can check NOTAM publications or liaise with the MABCC (details contained within or via Swanwick(Mil)) if they have questions as to DA activity.
9	The proposal document, particularly in its earlier iteration, used graphics which were hard to interpret against the local topography. We would be most grateful if any future consultations would present the airspace proposals superimposed on conventional CAA 1:500,000 or 1:250,000 charts as used by the civilian flying community.	Ability to understand the detail of the proposal	Nil.	In the future, the MOD will consider the use of a wider range of charts when detailing the change and promulgating to airspace users.
10	I fly a paramotor up to 5000 feet along the Redcar to Whitby coastline. Paragliders can often be found on this route as well. We fly over the sea and the land. The new proposal does not impact upon us as you have stated 5000-foot minimum for your change over sea. The proposal does however, bring us closer together.	Potential increase in risk of Loss of Separation between Military aircraft and GA	Nil.	Nil.
11	CAP740 (issue 6, May 2017) sets out the regulatory framework and governance of UK airspace management, and the application of FUA. NATS asks the MoD to jointly support a formal request to the CAA to change CAP740, aligning with the spirit of the MoD's Section 6 of their consultation document.	Airspace Policy	CAP740 changes are not deemed to be relevant as part of this ACP.	This feedback will be passed to the CAA for review and comment.
11	NATS recognises the commitment made by the MOD to improve its 3rd line airspace management procedures through trials currently being undertaken at Swanwick. NATS would welcome the nomination of a Senior Responsible Officer of Air Rank, who would be accountable for the delivery of agreed utilisation targets in line with the advocated 3 monthly reviews.	Adequate L3M	Nil.	One of the recommendations following the L3M Trial at RAF(U) Swanwick is to implement a permanent Cell alongside the airspace change. It has been suggested that an appropriate individual will be nominated as being responsible for efficient airspace management throughout that flying day. This is still for consideration and will be determined by the MOD Chain of Command.

12	<p>The Honourable Company of Air Pilots recognises that military assets need sufficient space to train, which MOD states as the reason for this request for increased segregated airspace and a larger EGD323. We are encouraged by MOD intention to adopt Flexible Use of Airspace to maximise airspace availability for other users when possible and to review the airspace management protocols and agreements every 3 months. However, paragraph 9.2 states, "Should the proposal be approved and implemented, it would be difficult and undesirable to revert to the pre-implementation state. Therefore, any safety or operational concerns regarding the larger EGD323 could be managed through activation protocols and airspace management procedures."</p>	Reversion Policy	Nil.	<p>On liaison with NATS, it has been agreed that reverting back to previous designs would be too cumbersome and expensive. With regards to the segregated airspace, if it was determined that the airspace design was not working, the MOD would cease to book the segregated airspace, pending review and redesign.</p>
13	<p>Although the overland areas (F-J) do not encroach on DTVA's controlled airspace, they will have an impact on Cobham's Falcon 20 transits, both outbound and on recovery as the proposed base is FL150. Outbound, we will have to restrict climb to &lt;FL150 if the areas are active. This will have a corresponding consequence on fuel burn and thus time on task with Typhoons. The other aspect of this is that our transits and take-off times are often dictated by our ability to get to height so they may well be extended if we have a situation where we are denied the ability to climb. The solution to this could be to climb to the west of the proposed airspace but this would force us to climb through congested airspace in the Vale of York, something we like to avoid. Recovery to base will also be slightly more problematic, especially from areas F and G. If we are required to exit the area in a hurry at the end of our allotted range slot we could find ourselves with a lot of altitude to lose in a limited number of track miles.</p>	Increase risk of Loss of Separation against Military transiting to segregated airspace, and also leaving and entering	<p>The MOD have agreed that Military aircraft transiting to and from the overland portions of the new airspace (F-K) will be in receipt of an ATS, these transits should not be conducted autonomously.</p>	<p>The MOD understands the concerns with regards to the reduced airspace available to transiting aircraft, including the impacted heights and transit times. The MOD will work with Cobham to ascertain feedback at appropriate intervals following implementation in order to understand the severity of the impacts. If these concerns are still an issue, the MOD will consider further mitigations.</p>
14	<p>For Outbound EHAM traffic, these routes could be optimized to be closer to the edge of the expanded airspace: Proposed: GIGUL KULOZ (544449N0030559E) ANARU (554036N0020559E) GOMOT 165.1nm Improved proposal: GIGUL RODSI 554157N0015408E GOMOT 162.8NM Delivering 2,3nm improvement to the proposed N44/N66 route.</p>	Route Design	Nil.	<p>The MOD consulted heavily with NATS as to the design and adjustments of the routes. Given the current CAA Buffer Policy requirements, the routes proposed were deemed the most safe and efficient way of routing around the newly created airspace.</p>
14	<p>The proposed non-bookable window does not support the main westbound flow from EHAM.</p>	Airspace Sharing Protocols	Nil.	<p>The MOD have liaised with NATS to consider the network as a whole. Further clarity as to the suppression window will be detailed in the Final Submission.</p>

14	<p>The N110 does support the DOLAS traffic without high impact. NALAX flights however will be impacted highly. CDR dependency of optimal routing should be avoided to minimize dis-benefit for flights in/out Scottish TMA and take benefit of improved routing to TLA. An alternative should be considered to avoid this. For example, by:</p> <ol style="list-style-type: none"> <li>1. Adding a LIBSO-ERKIT connection which stays clear of D323</li> <li>2. Vertical segregation limit to Area F (and J) and non-bookable or civil preferential between 0900-1200 and/or if area KLMNPQ are active to minimize impact on transatlantic traffic.</li> </ol>	Route Design	Ni.	<p>The MOD have liaised with NATS to address the suggestions below:</p> <ol style="list-style-type: none"> <li>1. A permanent LIBSO-ERKIT connection cannot be catered for as it does not adhere to the CAA Buffer Policy.</li> <li>2. The MOD have established sharing processes in areas K-Q but given the high importance of the overland portions; these protocols are considered inappropriate for these areas.</li> </ol>
15	<p>Whilst we do not have the insight that the MOD has, we understand that the UK is significantly short of armed forces personnel, and although there is a commitment to purchase more aircraft for the RAF, will these aircraft actually be delivered? If they are not, does this alleviate the airspace requirements and can airspace be handed back on a permanent basis?</p>	Airspace Requirements	Nil.	<p>The MOD are currently planning for the introduction of the F35; 9 in 2018, 49 by 2022 and 75 by 2024. The Typhoon fleet is also planned to increase from 90 to 108 aircraft by 2021. If the MOD's stance changes, the airspace will be adjusted accordingly.</p>
15	<p>The MOD has other UK danger areas already established, with overland portions where land based assets can be engaged. So why does it have to have this particular area? For example, the Tain range in the NE of Scotland has a very short transit time from RAF Lossiemouth, which is already a Typhoon base, and the F35 could also operate from here. Air combat training could be carried out in the current EGD 323 area and the engagement of ground assets achieved on other ranges such as Tain or Holbeach, which we note is also going through a current ACP.</p>	Overland Portion of new Airspace Design	Nil.	<p>The Design Principles of the DA state that the minimum requirement for segregated airspace is a 120nm by 60nm box including a portion overland; neither Tain nor Holbeach caters for these requirements. The basing of F35 at Marham and Lakenheath had been agreed at Government level prior to the commencement of this ACP.</p>
15	<p>We would however, suggest that more training could be done in simulators rather than requiring the large areas of airspace being proposed in this ACP to be unavailable to other airspace users.</p>	Use of Segregated Airspace	Nil.	<p>The MOD conducts a vast majority of flying training synthetically already; there must be an element of live training to ensure aircrew are fully prepared for the combat environment.</p>

15	The current management of EGD 323 complex is run by the UK MABCC and activity is notified D-1. This is critical for airlines, both long haul operators and for the short haul carriers, especially those operating to and from Newcastle or the Scottish TMA airfields. This is a “must have” under the development of the FUA concept of operations, as if this new area is to work at all, activity must be planned D-1 and then be executed in accordance with the plan. This will change when the capabilities of being able to switch the airspace on and off through electronic means are realised as alluded to above. This will then allow for adjustment and development of the airspace management protocols, which will allow the airspace to be managed on a more tactical basis.	Airspace Management	Nil.	All MDA activity is booked by 1700 D-1. No new MOD activity in the D323 complex is booked at D-0. It is the intention of the MOD to execute their flying programme as planned but due to aircraft serviceability and weather, this is not always the case. To adhere to good FUA principles, the MOD work hard to hand back airspace with as much notice as possible, allowing airlines the opportunity to re-file.
16	The MoD basing decision for these aircraft being taken prior to stakeholder engagement on airspace does seem a little disjointed and seems to give the country a fait accompli rather than transparent dialogue.	Position of Segregated Airspace	Nil.	The basing of F35 at Marham and Lakenheath had been agreed at Government level prior to the commencement of this ACP.
16	When active the proposed airspace will see some aircraft operating from Newcastle International Airport having to operate with a reduced payload and all aircraft having to route significant additional track miles to current practise; in some cases this could make routes unviable and with it damage the regional economy.	Potential increase in track miles	Nil.	It is not the function of the ACP to fund runway extensions at Newcastle Airport. The current ability for aircraft to make use of irreducible ATM capacity to transit off the civil route structure has been maintained and the LOA amended to support this. If another Airspace change were suggested in this area the MOD would engage through the CAP 1616 process.
17	Thus, I request that any proposed change to the dimensions of D323 that affect the positioning of L602 also takes account of any proposed change to the dimensions of D207 and vice versa.	Other impacting ACPs	Nil.	The MOD acknowledge this point. The MOD will liaise with the D207 Airspace Sponsor and ensure they are cognisant of the changes in the D323 complex and the potential impact on airspace users.
18	The nature of our operation is such that we do not anticipate any of our normal scheduled flights will be directly interact with this airspace volume. However, there would be an overall network impact when all or some of these areas are active, due to the redistribution of traffic around the active areas. As such, we would expect robust ASM techniques to be used and mitigation put in place to minimise any impact to users caused by "knock on"	Airspace Management	Nil.	The new airspace has been designed to allow for all elements to be active simultaneously to cater for particular training sorties. When the elements of the airspace are not required, they will not be booked. Robust protocols have also



	delays. This is of particular importance to us with regard to airspace sectors that may be effected by a combination of the area activation and positioning of the North Atlantic Tracks on a given day.			been written in order to minimise disruption to the North Atlantic Traffic flows.
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## 7. Safety Assessment

Both the MOD and NATS conducted Safety HAZIDs investigating the impact of the new Airspace Design. It is assessed that any new hazards are those concerned with the introduction of the new airspace i.e. familiarity and complexity.

A number of barriers and mitigations already exist for the detailed hazards that may result from a lack of familiarity. In addition, bespoke training and education will be provided to aircrew, controllers and Airspace Managers.

The additional airspace structures add complexity to both the operation and management of the airspace. There are already barriers and mitigations in place for the hazards that may arise from airspace complexity. Following early simulation work there is some potential concern that the airspace design when fully active will create conflicts for Military aircraft routing north/south through the NATEB crossing climbing and descending Civil traffic. In the most demanding traffic scenarios it is possible that these conflicts may not be resolvable via normal Air Traffic Control methods. NATS and the MOD have agreed to not introduce the F segment of the design until NATS have introduced their Common Operating Platform (expected March 2020) and the MOD and NATS controllers at Swanwick and Prestwick Centres are operating on the same platform. This will allow for the use of Medium Term Conflict Detection (MTCD) tools and reduce the risk to aircraft transiting in the vicinity of NATEB.

All change creates an element of risk to safe operations. In this case, the potential new hazards are broadly understood and the barriers/mitigations required are either in place already or can be readily applied. It is therefore considered that the proposed design will meet the required level of safety.

The NATS safety assurance argument follows the NATS Safety Management System (compliant to CAP 670 and accepted by the CAA). The safety assurance argument will present safety goals and supporting evidence to demonstrate that the changes to be introduced by the project will be tolerably safe for operation.

Safety observations and comments have been collected from two development simulations undertaken for the project. These were used to draft four hazards which were analysed by controllers holding validations for the sectors impacted by the project changes. Mitigations have been identified for the hazards to reduce the residual risk to an acceptable level.

Following the validation simulation (26 September 18), an additional hazard analysis workshop will be held to re-confirm the safety risk picture. As part of the project's safety assurance strategy there will also be a Post Design Safety Review completed to inform on any net safety benefits or dis-benefits associated with the project and act as an additional, independent review of the hazard analysis output and validation evidence. The project will also produce a Project Safety Assurance Report, presenting the entire safety assurance argument.

## 8. Design Updates

The MOD have taken all of the comments received during the consultation into consideration. Several respondents suggested variable base levels in the overland portions, but given the feedback as to the added complexity, it will be the norm for all sorties to book a base level of FL150. The MOD will retain the ability to book the airspace via NOTAM, and book to a higher, more appropriate level for that activity, if required.

The sharing window was also discussed by several respondents. The MOD have agreed with NATS that the sharing protocols will be available between the hours of 1000 and 1400 **local**; during these times the MOD will adhere to Civil invoked primacy. The MOD will cap activity in L – R at FL300, allowing Civil use from FL320 and above. One airline suggested that this window may not be early enough to meet the requirements of their European transits. The MOD have agreed that they will consider other Civil Suppressions requests outside of this window, following liaison between the MAM and CAM. These sharing protocols will be reviewed at the three-monthly Post Implementation Reviews.

## 9. Summary

Following the considerations of the consultation and ongoing liaison with NATS, the MOD have chosen to not update the final design. The Airspace Management Protocols and sharing window can always be adjusted and are available for further discussion but any reversions of the proposed designs or even minor adjustments would be too expensive and cumbersome to NATS. Should any problem or issue arise with the segregated airspace, the MOD would consider not booking elements until a resolution could be found.

The MOD are planning to engage with all airspace users and Key Stakeholders at three-month intervals, to assess such elements of the design and operation. The MOD believe adapting the current design further would result in a failure to adhere to the Design Principles and an intolerable delay to the introduction of required segregated airspace for Military aircraft.