# Free Route Airspace Deployment 2.1

## PEMAK Triangle, TAKAS Box

# Consultation

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**Prepared by NATS Airspace Change Assurance**

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# 1 Executive Summary

Free Route Airspace (FRA) is well established in Europe and NATS has been involved in developing the FRA concept over the last 5 years. FRA is a major initiative of the UK CAA's Airspace Modernisation Strategy (AMS) (CAP 1711). The implementation of FRA by European Union (EU) member states was mandated in European Law under the EU Implementing Regulation EU716/204 and has been recommended as a part of the Eurocontrol Single European Sky ATM Research (SESAR) programme.

Aligned to the UK AMS, NATS is proposing to phase the introduction of Free Route Airspace (FRA) across UK airspace. This deployment is specifically concerned with the introduction of FRA in airspace where the provision of ATS has been delegated to the IAA Shannon ACC and the DSNA Brest ACC in the far south west corner of the UK UIR. These regions are currently known as the PEMAK Triangle and the TAKAS Box and are depicted in Figure 1 below. NATS sponsors this airspace change but the provision of Air Traffic Services (ATS) in the region has been delegated to Brest and Shannon for decades. This provides the best primary radar cover and enables the most efficient management of traffic flows. The introduction of FRA will allow aircraft in upper airspace to flight plan and fly between waypoints and not be constrained by the current network of routes.

The change from a network of routes to FRA represents a significant change for aircraft operators and Air Traffic Control (ATC); NATS welcomes your feedback to develop our proposed deployment. Future deployments will be consulted on through separate Airspace Change Proposals (ACP).

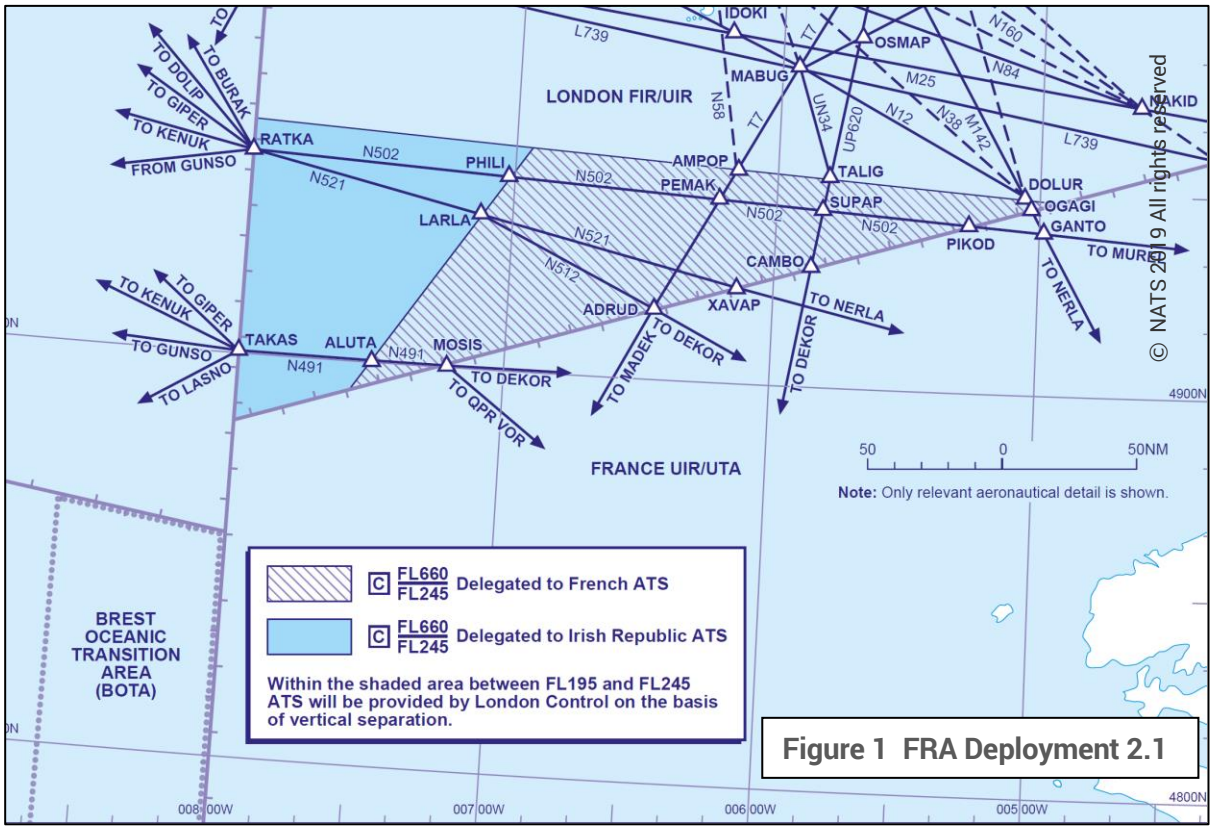


Figure 1 FRA Deployment 2.1

The level of change expected to support the implementation of FRA requires airspace changes to be implemented effectively and safely. Along with the European Mandate to implement FRA and the CAA's AMS, developing the concept to support the needs of Airspace Users and Aviation Stakeholders remains important to ensure changes are fit for purpose and comply with the required regulation and legislation.

We also want to share the potential benefits for implementation of FRA against the proposed options presented in the consultation document:

- FRA Option 1. Implement FRA in accordance with Implementing Regulation EU716/2014, remove all ATS routes and rationalise waypoints in accordance with the DSNA Brest ACC FRA design in both the PEMAK Triangle and TAKAS Box
- FRA Option 2. Implement FRA in accordance with Implementing Regulation EU716/2014, remove all ATS routes and rationalise waypoints in accordance with the DSNA Brest ACC FRA design in the PEMAK Triangle but retain ATS routes in the TAKAS Box

The changes proposed in this ACP will only affect flights above FL245, c.24,500ft

The consultation begins on 11th January 2021 and ends on 8th February 2021, a period of 4 weeks.

This consultation document and response questionnaire are available via the CAA airspace change consultation portal at:

https://consultations.airspacechange.co.uk/nats/fra-d2-1

If the proposal is approved by the CAA, implementation of the airspace change will occur on 2nd December 2021.

# 2 Introduction

## 2.1 About this consultation

This consultation relates to changes to airspace and the ATS route structure which will enable changed aircraft flight profiles above FL245, c.24,500ft. We are seeking feedback from targeted stakeholders who may be affected by the proposal. Primarily this is likely to be users of the airspace, neighbouring ANSPs and other aviation stakeholders. Nonetheless we welcome feedback from any interested parties.

Your feedback at this stage will help us explore the potential impacts of the changes proposed to be made to the FRA Deployment 2.1 (D2.1) airspace. We invite considered responses supported by evidence where possible.

## 2.2 Scope of This Consultation

This consultation and ACP proposes the introduction of FRA (in the UK) within airspace in which the provision of Air Traffic Services (ATS) is delegated to the IAA and DSNA (known as the PEMAK Triangle and TAKAS Box) in the south west corner of the UK Upper Information Region (UIR) (across the area depicted in Figure 1). The UK FRA deployment plan initially sought to introduce FRA in this region as part of the second FRA deployment, known as FRA D2, which originally aligned with Brest and Shannon ACCs' airspace change requirements and schedule. The UK's FRA timeline has changed but the Brest/Shannon timeline cannot. For this reason, the PEMAK Triangle and TAKAS Box is now progressing separately, as FRA Deployment 2.1, in accordance with Brest ACC's timelines and requirements

While the legal mandate requires that FRA is implemented in all airspace at and above FL310, in the D2.1 area FRA will be proposed in line with the levels in which the provision of ATS has been delegated – FL245+.

## 2.3 Proposed FRA Deployment Plan

FRA Deployment 2.1 is targeted to be introduced on 2nd December 2021 (AIRAC 12/2021). This consultation is related to the proposed Deployment 2.1 airspace only.

Figure 2 below shows the proposed sequence of FRA deployment phases across the UK.

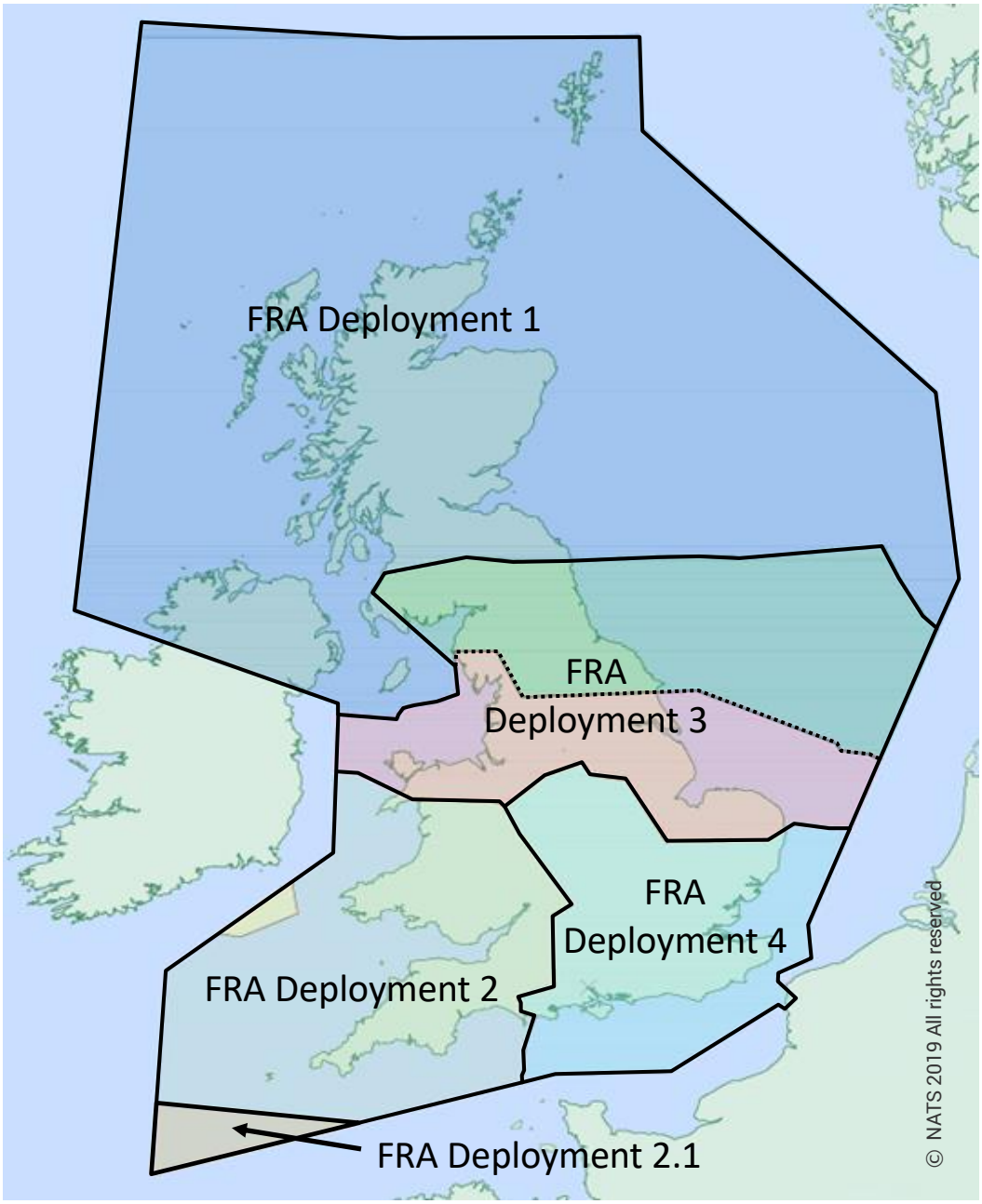


**Figure 2 Planned FRA Deployment Phases.**

## 2.4 Why not implement in one go, and progress the changes in one ACP?

The scope of the first FRA Statement of Need submitted to the CAA which initiated the ACP process was to introduce FRA throughout the UK. Following the assessment meeting and initial work on design principles and options development, it became apparent that the scale of the ACP (in particular the length of time required to implement FRA in phased geographical deployments) did not easily align with the engagement and consultation requirements of the ACP process. The implementation of FRA was assessed against influencing factors, such as system requirements, simultaneous airspace modernisation projects (LAMP, ScTMA, FASI-S etc.), traffic flow complexity, Borealis Alliance commitments and the requirements of neighbouring ANSPs. The results of which necessitated a geographically phased implementation to enable the introduction of FRA within the mandated timescales. Therefore, in consultation with the CAA, the decision was taken to submit individual ACPs for each planned deployment of FRA.

## 2.5 Brexit

It should be noted that some of the legal requirements to implement FRA originate in EU law. It is NATS' position that due to wider commitments (e.g. Borealis Alliance and the CAA Airspace Modernisation Strategy) it remains the intention to introduce FRA regardless of the withdrawal of the United Kingdom from the European Union (EU) on 31 December 2020.

## 2.6 Options for Consultation

This change is constrained by the limitations of the Brest ACC Flight Data Processing System (FDPS), is mandatory under EU law, is an agreed strategic aim of the European Commission Single European Sky initiative and the CAA's Airspace Modernisation Strategy (AMS), therefore, the options development has been limited to the following:

1. Implement FRA in accordance with Implementing Regulation EU716/2014, remove all ATS routes and rationalise waypoints in accordance with the DSNA Brest ACC FRA design in both the PEMAK Triangle and TAKAS Box (preferred option).
2. Implement FRA in accordance with Implementing Regulation EU716/2014, remove all ATS routes and rationalise waypoints in accordance with the DSNA Brest ACC FRA design in the PEMAK Triangle but retain an ATS routes in the TAKAS Box.

For each of the options the IAA and DSNA Route Availability Document (RAD) restrictions would be introduced in order to manage the flow of traffic transitioning into and out of FRA.

(more details on these options is provided in section 6).

## 2.7 Stakeholders

The stakeholders targeted for involvement in this consultation are listed in Appendix A. However, feedback from any stakeholder would be welcomed and considered.

The primary stakeholder groups are:

- DSNA Brest ACC;
- IAA Shannon ACC;
- Airlines;
- Computerised Flight Plan Service Providers;
- National Air Traffic Management Advisory Committee (NATMAC) Members;
- Ministry of Defence;
- EUROCONTROL Network Manager

# 3 Justification and Objectives

This section outlines why FRA is being introduced, the legal mandate, and the objectives that will be achieved.

## 3.1 Justification

This ACP aims to introduce Free Route Airspace (FRA) within airspace where the provision of ATS has been delegated to Brest and Shannon ACCs in the south west of the UK UIR. This will aid flight efficiency by enabling aircraft to flight-plan and fly user preferred trajectories, where possible. Free route airspace is being implemented across the ICAO EUR region and is already in operation in several neighbouring States. The introduction of FRA in this region will ensure that the UK upper airspace is harmonised with that of our neighbouring states, enabling cross-border free routing in the future.

The introduction of FRA would enable environmental benefit by allowing airline operators to flight plan more efficient trajectories which could reduce $CO_2e$ emissions per flight. This in turn would produce economic benefit due to reduced operating costs.

The implementation of FRA by European Union (EU) member states was mandated in European Law under the EU Implementing Regulation EU716/2014 and is a major initiative of the CAA's Airspace Modernisation Strategy (AMS) (CAP 1711).

Therefore, NATS is undertaking this ACP on behalf of DSNA and the IAA to ensure the UK meets its legal obligations, as well as ensuring it conforms to the CAAs AMS requirements, whilst enabling airline operators to optimise their flight profiles.

## 3.2 Objectives

The objective of this ACP is to allow the harmonised introduction of FRA in the PEMAK Triangle and TAKAS Box, in coordination with FRA implementation in the adjoining French airspace.

## 3.3 Alignment with the CAA's Airspace Modernisation Strategy (AMS) Principles

The CAA's Airspace Modernisation Strategy (AMS) (Ref 2) is the UK's strategy for modernising the air navigation infrastructure. Sections 4.5-4.11 refer specifically to FRA as a means to improving efficiency in the upper airspace.

# 4 Current Airspace (Baseline)

The following pages describe the current airspace which forms the baseline (do nothing) scenario.

It should be noted that "Doing nothing" is useful as a baseline for comparison, however, due to being discounted during the design principles evaluation and that it is a legal requirement of the PCP mandate, it is not considered a viable option.

## 4.1 Current airspace diagram

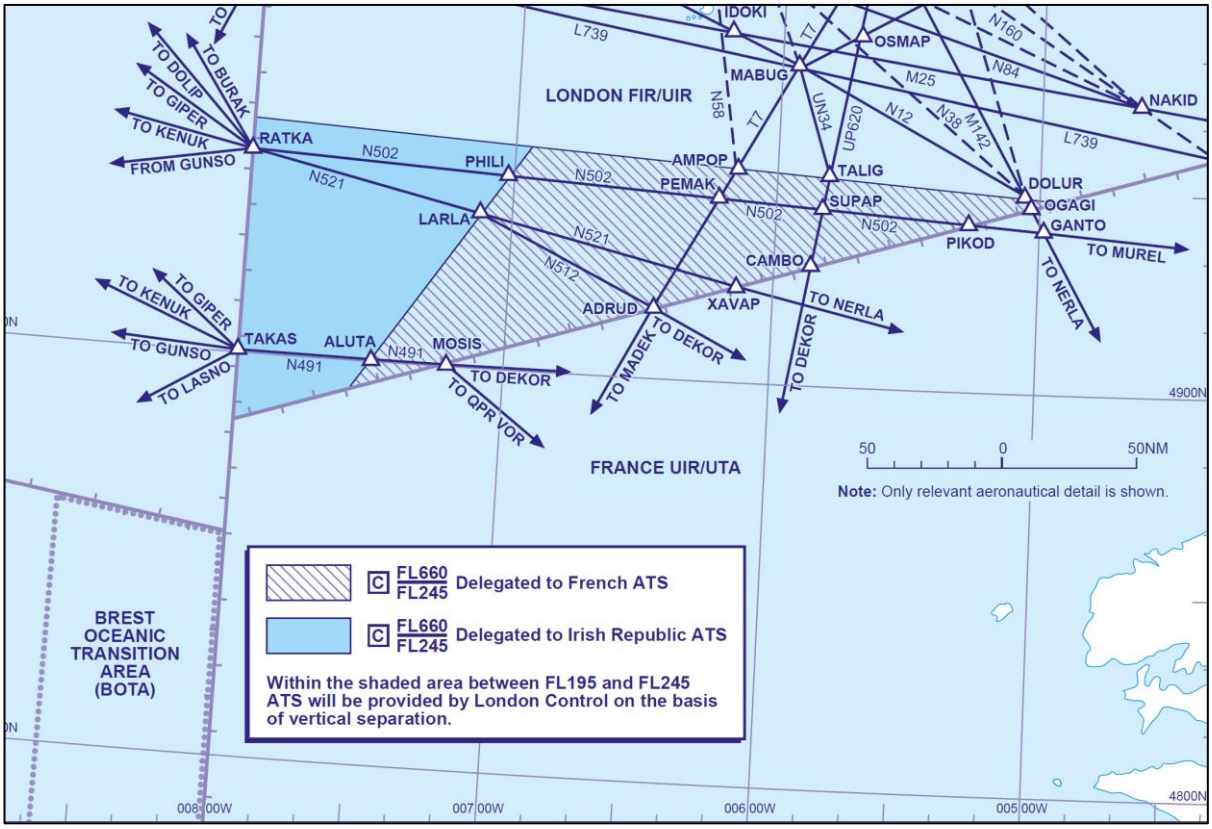


**Figure 3 Current PEMAK Triangle and TAKAS Box UIR airspace/routes**

Figure 3 shows the current PEMAK Triangle (cross-hatched area) and TAKAS Box (shaded blue) delegated ATS Upper information Region (UIR) airspace and Air Traffic Service (ATS) route network.

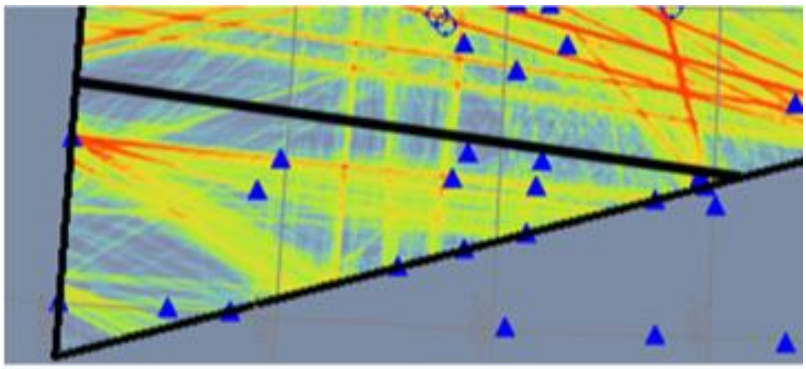

**Figure 4 Current PEMAK Triangle and TAKAS Box UIR traffic flows**

Figure 4 shows current flight-path density plots (from 2018 radar data). This shows the typical flows of traffic in the UIR.

Currently all aircraft flight plan to fly along the published Air Traffic Service (ATS) route structure. Modern satellite navigation now makes navigation between any points possible. It is now common-place for air traffic control (ATC) to allow aircraft to route direct to a point (termed a tactical direct), to improve efficiency as aircraft transit through the airspace. The use of the designated entry/exit points (termed coordination points (COPs)) at the UIR boundary, and the influence on flight-paths of the ATS route structure can be seen clearly in Figure 4. However, the regular use of tactical direct shortcuts to/from the COPs can also be discerned.

For reference, the UK route structure is defined in detail in the following sections of the UK Aeronautical Information Publication (AIP) (Ref 7):

ENR 3.3 AREA NAVIGATION ROUTES
ENR 6.70 UPPER AIRSPACE CONTROL AREA AND UPPER ATS ROUTES (South Sheet)

# 5 FRA Concept Overview

FRA is defined as "A specified airspace within which users may freely plan a route between a defined entry point and a defined exit point, with the possibility to route via intermediate (published or unpublished) waypoints, without reference to the ATS route network, subject to airspace availability." Within this airspace, flights remain subject to air traffic control.

Deployment of FRA is an EU legal requirement[1].

Within FRA air traffic will be able to flight plan user preferred trajectories without reference to a route structure, therefore flows of traffic are able to change hour by hour, month by month and year by year (subject to restrictions published in the Route Availability Document) in a manner which is not constrained by airspace design and is therefore less predictable. Short and long term factors which can have an influence on the routings chosen by aircraft operators include:

### Short Term Factors

- weather/winds (jet stream position),
- industrial action,
- events such as large sporting events (e.g. football matches, Olympics etc),
- military activity,
- ATC traffic regulations (used to manage flows).

### Long Term Factors

- relative route charges between neighbouring countries,
- fuel prices,
- company business models/ fleet mix,
- seasonal route preferences,
- changing destinations and emerging markets,
- political factors,
- tourism preferences/marketing/fashion.

FRA is expected to facilitate flight planning and fuel benefits which will contribute to the UK Ireland Functional Airspace Block (FAB) Performance Plan & UK Airspace Modernisation Strategy (AMS).

## 5.1 Overflights.

Aircraft transiting FRA will have to flight plan via FRA Entry and FRA Exit waypoint to transit between FRA and an ATS route structure. Aircraft will be able to flight plan FRA intermediate waypoints within the FRA volume.

## 5.2 Arrivals

There is no requirement to publish any of the waypoints within the PEMAK Triangle or TAKAS Box as FRA arrival points.

## 5.3 Departures

There is no requirement to publish any of the waypoints within the PEMAK Triangle or TAKAS Box as FRA departure points.

[1] Legislative requirement of the SESAR Pilot Common Project (PCP) ATM Functionality 3 (AF3) Implementing Rule. The SESAR PCP AF3 requires ANSPs to implement FRA, at FL305+, by 1st January 2022.

## 5.4 Borealis Alliance

The Borealis Alliance membership (which includes NATS and the IAA) have worked cooperatively since 2012 to develop a common FRA concept of operations as outlined in the Borealis Free Route Airspace Concept of Operations v1.0 (Ref 1).

NATS has committed to introducing FRA in UK upper airspace to facilitate the harmonised Borealis Alliance volume of FRA. Borealis member ANSPs have committed to put in place a seamless and integrated FRA (Cross-Border) extending across national airspace boundaries, from the eastern boundary of the North Atlantic to the western boundary of Russian airspace in the North of Europe; without the need for crossing boundaries at mandated points (COPs). The DSNA Brest ACC FDPS is unable to process cross border FRA flight plans and DSNA are not part of the Borealis Alliance. Therefore, cross-border FRA will not be considered within this proposal.

Figures 5-7, show the development of the Borealis FRA Airspace (source Borealis Alliance 2019).


**Figure 5 Current State of Borealis FRA (2019)**


**Figure 6 Borealis FRA, Post UK FRA D1 (Dec 2020)**

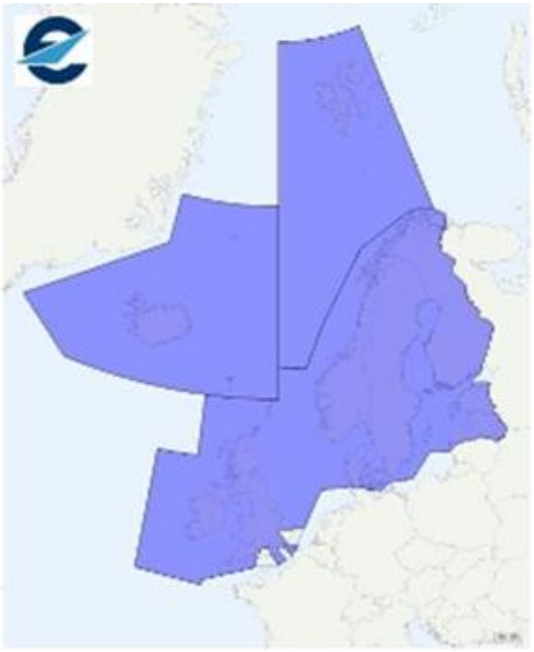


**Figure 7 Borealis FRA Post 2024**

## 5.5 FRA - Options

Figure 8 shows the FRA area which is under consideration for Deployment 2.1.

The following options are proposed for consultation.

FRA Option 1 – Implement FRA in accordance with Implementing Regulation EU716/2014, remove all ATS routes and rationalise waypoints in accordance with the DSNA Brest ACC FRA design in both the PEMAK Triangle and TAKAS Box (preferred option).

FRA Option 2 – Implement FRA in accordance with Implementing Regulation EU716/2014, remove all ATS routes and rationalise waypoints in accordance with the DSNA Brest ACC FRA design in the PEMAK Triangle but retain an ATS routes in the TAKAS Box.

These design options proposed are discussed in Section 6 in detail.

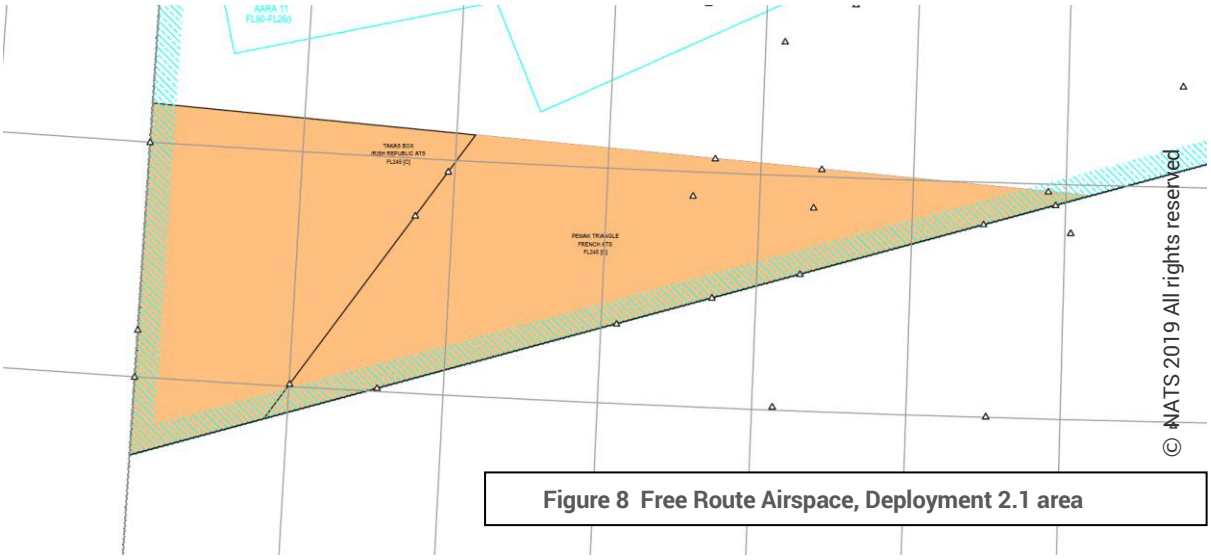


**Figure 8 Free Route Airspace, Deployment 2.1 area**

# 6 Proposed FRA Options

The purpose of this consultation is to allow you to give your feedback on the proposals for the deployment of FRA within the PEMAK Triangle and TAKAS Box. This section presents the options for possible implementations of FRA, upon which we request your feedback.

## 6.1 Options

Early engagement with Brest and Shannon ACCs highlighted the constraints associated with this proposal as follows:

- Brest ACC must deploy FRA to meet the extant PCP mandate:
  *Flexible Airspace Management and Free Route shall be provided and operated in the airspace for which the Member States are responsible at and above FL310 in the ICAO EUR region…from 1 January 2022.*
- Brest ACC's Flight Data Processing System (FDPS) cannot operate in a mixed mode, i.e. where one volume of airspace is FRA and another part consists of a 'conventional' ATS route structure. Therefore, they have to remove the route structure in published FRA.
- NATS sponsors this airspace change but does not provide an air traffic service to aircraft in the region. ATS in the region has been delegated to Brest and Shannon ACCs for decades. The flows in the region essentially join Brest's Area of Responsibility (AOR) with the AOR of Shannon, crossing a small corner of southwestern UK airspace FL245+ without any interaction by UK (NATS) controllers.
- The French and Irish primary radar cover in this region at 25,000FT is better than that available to NATS controllers (see UK AIP ENR 6-10).
- Brest ACC has a fully mature airspace design for the entire Brest ACC AOR, including this region, suitable for their FDPS.
- Brest ACC has followed French airspace change process regulatory requirements to develop their design – NATS has no influence on that process.
- The IAA already operate FRA (fulfilling the PCP mandate). The IAA have stated that they are content to change the airspace within the TAKAS Box in accordance with Brest ACC's airspace requirements and timeline.

Due to these constraints, the mandate under EU law, the CAA AMS and that the introduction of FRA is an agreed strategic aim of the European Commission Single European Sky initiative, the options development has been limited to the following:

- Option 1. Implement FRA in accordance with Implementing Regulation EU716/2014, remove all ATS routes and rationalise waypoints in accordance with the DSNA Brest ACC FRA design in both the PEMAK Triangle and TAKAS Box (preferred option)
- Option 2. Implement FRA in accordance with Implementing Regulation EU716/2014, remove all ATS routes and rationalise waypoints in accordance with the DSNA Brest ACC FRA design in the PEMAK Triangle but retain ATS routes in the TAKAS Box

For each of the options, the IAA and DSNA RAD restrictions would be introduced in order to manage the flow of traffic within and transitioning into and out of FRA.

## 6.2 FRA Option 1

Option 1 would remove all ATS routes and rationalise waypoints in accordance with the DSNA Brest ACC FRA design in both the PEMAK Triangle and TAKAS Box as illustrated in Figure 9.

Retained waypoints are shown in Table 1. The proposed removal of PEMAK would necessitate renaming of the area in which ATS is delegated to DSNA Brest ACC. It is proposed that it is renamed the LARLA Triangle.

Free route trajectories/traffic flows would be managed in the French RAD and Irish RAD. The removal of ATS routes in the TAKAS Box provides a consistent FRA design throughout the airspace in which the IAA Shannon ACC provide the ATS. Furthermore, this option is consistent with the Borealis FRA concept and the removal of ATS routes is consistent with EUROCONTROL guidance. This option is NATS' preferred solution.

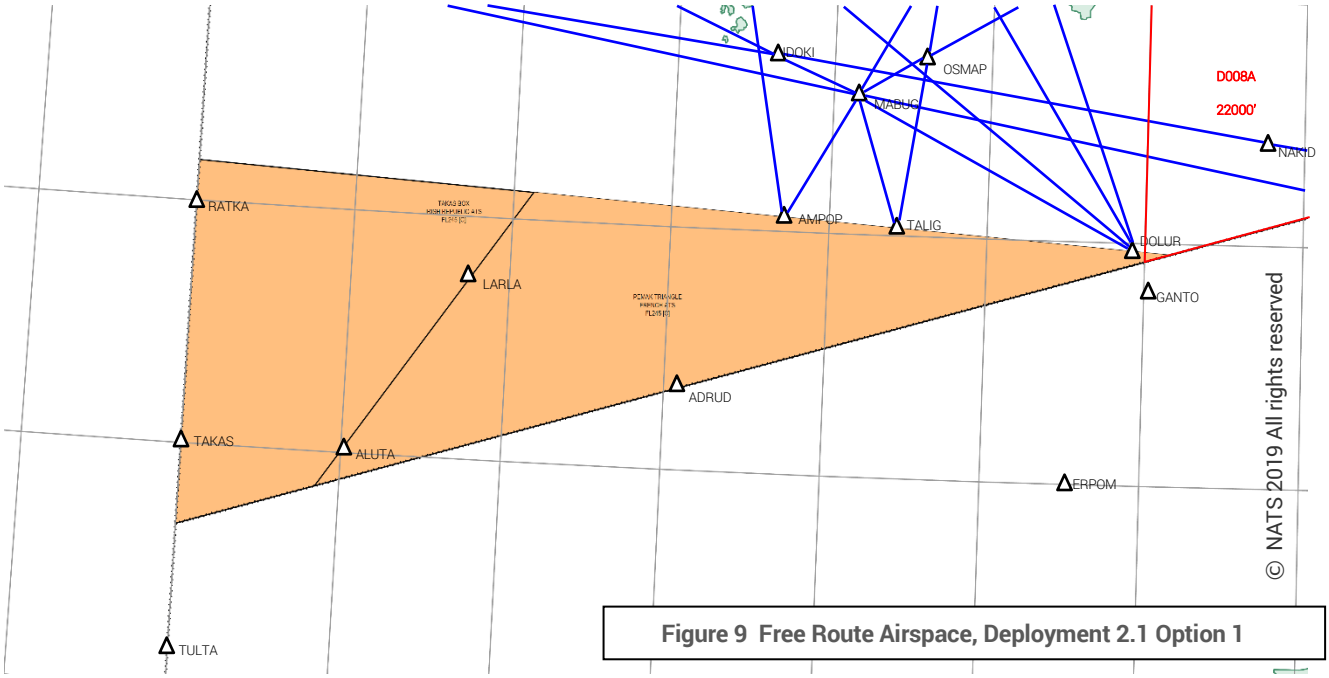


**Figure 9 Free Route Airspace, Deployment 2.1 Option 1**

| Existing waypoints within the region | Retained waypoints within the region |
|---|---|
| DOLUR | DOLUR |
| TALIG | TALIG |
| AMPOP | AMPOP |
| RATKA | RATKA |
| PHILI | |
| PEMAK | |
| SUPAP | |
| PIKOD | |
| OGAGI | |
| CAMBO | |
| XAVAP | |
| ADRUD | ADRUD |
| LARLA | LARLA |
| MOSIS | |
| ALUTA | ALUTA |
| TAKAS | TAKAS |

Table 1- Waypoint rationalisation

## 6.3 FRA Option 2

Option 2 would remove the ATS route structure and rationalise waypoints within the PEMAK Triangle but retain a route structure in the TAKAS Box as illustrated in Figure 10

Retained waypoints are the same as option 1 shown in Table 1. The proposed removal of PEMAK would necessitate renaming of the area in which ATS is delegated to DSNA Brest ACC. It is proposed that it is renamed the LARLA Triangle.

Free route trajectories/traffic flows would be managed in the French RAD and Irish RAD. This option takes account of the constraints of deploying FRA on the DSNA Brest ACC FDPS and meets the requirements of the PCP mandate. However, the retention of some ATS routes may reduce opportunities to realise fuel saving and $CO_2$ emission benefits.

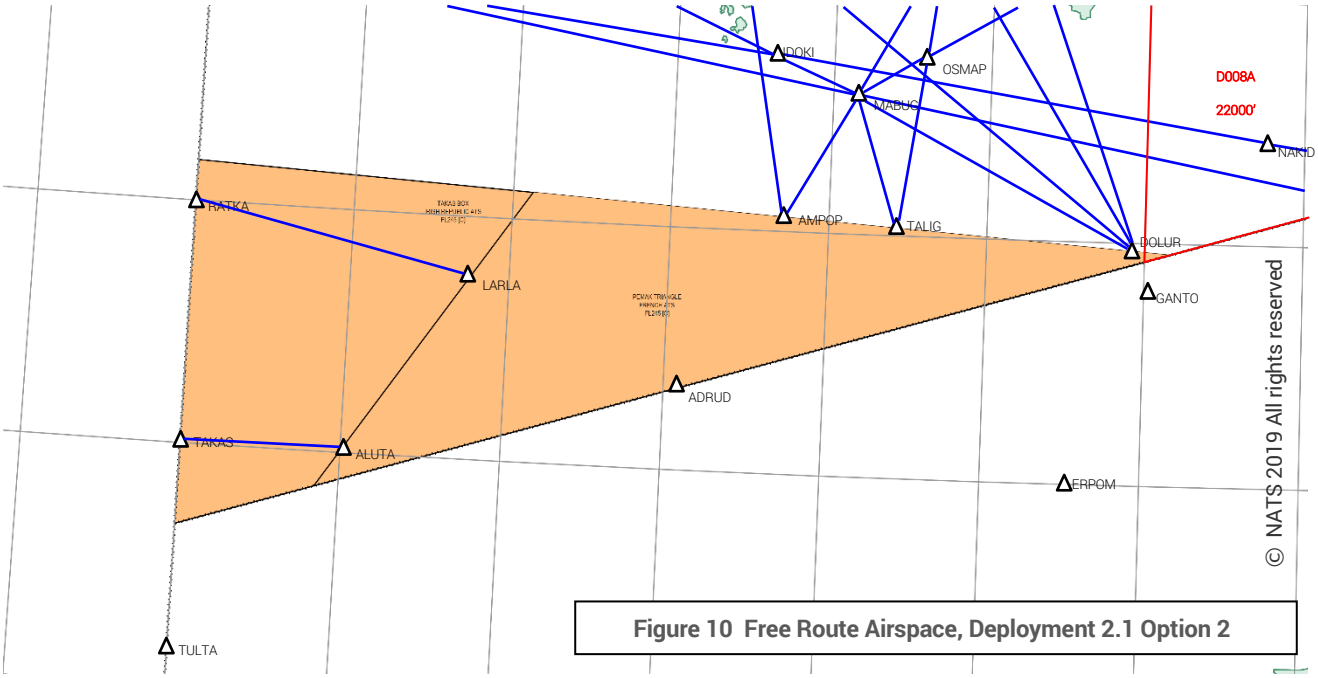


**Figure 10 Free Route Airspace, Deployment 2.1 Option 2**

## 6.4 Design Principles

The proposed FRA options have been designed in accordance with the design principles as detailed in the Stage 1B Design Principles document.

## 6.5 PBN equipage

The FRA airspace will not be designated as having an associated RNAV specification (as is required for ATS routes). However, RNAV5 equipage is mandated above FL100 and hence all aircraft (other than State aircraft) operating in this airspace must be RNAV5 equipped as a minimum.

## 6.6 Traffic management and separation

The proposed FRA will be managed by DSNA Brest ACC and the IAA Shannon ACC. Flights will be monitored by ATC. Optimisation of traffic flows will be achieved in areas of high traffic density and complexity through the use of RAD restrictions.

## 6.7 Other Design Options Considered (but not progressed)

Full assessment of design options which were considered but not progressed is given in Ref 3 (Design Options and Design Principle Evaluation).

## 6.8 Full options assessment

The "Options Appraisal (Phase II – Full) including safety assessment" (Ref 4) as required by CAP1616 (Ref 5), accompanies this document and is published on the CAA portal for this airspace change proposal.

## 6.9 Implementation Timetable

The targeted implementation date this change would be 2nd December 2021 (AIRAC 12/2021). Implementation is subject to CAA approval.

# 7 Impacts of this proposal

This section describes the impacts and/or benefits of the proposed FRA options.

## 7.1 Noise, visual intrusion, the general public, stakeholders on the ground

The options presented within this consultation impact flights above FL245, c.24,500ft, and the airspace is wholly over the sea. This is well above the 7,000ft threshold stipulated by the Department for Transport, below which overflights are deemed to have significant impact on stakeholders on the ground. As such, it has been assessed that there would be no discernible change to noise or visual intrusion and no change in impact to stakeholders on the ground due to any of the proposed FRA options.

## 7.2 $CO_2e$ emissions & fuel burn

$CO_2e$ emissions & fuel burn analysis has been performed using computer simulations which modelled the operation of the FRA D2.1 airspace. The results of this modelling indicate that the proposed changes will enable a reduction in average fuel burn and $CO_2e$ emissions per flight. The best-case forecast average reduction in fuel burn from the simulated 2017 sample data (with all ATS routes removed) is 37kg per flight (based on 31,977 flights), this gives a best case total reduction of 1,186.7 tonnes of fuel p.a. (2017 traffic level), and a forecast best case reduction in $CO_2e$ emissions of 3,773.6 tonnes p.a. (2017 traffic level)[2].

The summed overall impacts for each option for 2021 and 2031 are summarised in Table 2 below.

| Overall figures | 2021 $CO_2e$ (T) saving | 2031 $CO_2e$ (T) saving | $CO_2e$ (£) (traded) value | $CO_2e$ (£) (non-traded) value | 2021 Fuel saving (£) value | 2031 Fuel saving (£) value |
|---|---|---|---|---|---|---|
| **Option 1: 100%** | 2,002 | 2,325 | 295,046 | 464,673 | 177,740 | 206,474 |
| **Option 2: (40% TAKAS Box)** | 1,726 | 2,005 | 254,441 | 400,719 | 153,278 | 178,058 |

Table 2 $CO_2e$ emissions & fuel burn impacts for each FRA Option (Note: Due to the uncertainty regarding how operators will react and flight-plan within FRA, a conservative approach was taken and forecast savings have been halved. The figures have been grown year-on-year according to the NATS base traffic forecast figures (from 2017) to 2031 and these figures used as the WebTAG input). Please note that these forecasts were based on pre-COVID-19 pandemic data. Based on the current unprecedented down-turn in air traffic the outcome may differ significantly from the forecast..

Column 2 & 3 in Table give the annual $CO_2e$ emissions savings estimated for each option in 2021 and 2031. Columns 4 & 5 give the figures for monetised value of traded and non-traded $CO_2e$ emissions savings, totalled across the years 2021-31. Columns 6 & 7 give the annual saving in fuel cost, estimated for each option for 2021 and 2031.

Results from WebTAG are given in Appendix A of the Full Options Analysis (ref 4). Note that the results in Table above summarise the computer simulation results which are given in full in Table 2 & 3, Appendix A of the Full Options Analysis (ref 4).

[2] Due to the uncertainty regarding how operators will react and flight-plan within FRA, a conservative approach was taken and forecast savings have been halved. The figures have been grown year-on-year according to the NATS base traffic forecast figures to 2031 and these figures used as the WebTAG input. The figures presented here is the raw output from the simulation using the 2017 sample prior to adjustment for WebTAG input.

## 7.3 Airspace capacity

The flight-plan options FRA enables could allow airlines to avoid capacity constrained areas and avoid consequential delay and cost. However, this is not quantifiable and no specific change in capacity is assumed or claimed by this proposal.

FRA implemented with no restrictions could result in a reduction in the airspace capacity. Hence RAD restrictions would be used to manage the flow of traffic transitioning into and out of FRA, and to provide some optimisation in areas of high traffic complexity.

## 7.4 Ministry of Defence

The proposed FRA is not expected to have any impact on MoD operations. There are no SUA volumes within the region, however, the 2,000ft buffer required[3] between the upper limit of EG D008A (22,000ft) and the lowest flight plannable free route trajectory (FL250) where the proposed FRA volume overlaps the SUA needs to be considered. The required vertical buffer may not exist depending on the QNH in use within the SUA.

There are three options to address this issue:

- Conduct a safety assessment to determine if a do-nothing approach would be satisfactory. This option does not guarantee a suitably robust outcome. It would require MoD and DSNA participation, both of whom use different safety management systems to NATS. This option would be difficult to facilitate, time consuming and disproportionately costly to achieve the desired outcome.
- Establish a Flight plan Buffer Zone (FBZ). EG D008A is a Non-Airspace management cell Manageable airspace (NAM). An FBZ associated with EG D008A would be activated for the periods published in AIP ENR 5.1 (Mon-Thu 0800-2359 (0700-2300), Fri 0800-1600 (0700-1500); and as activated by NOTAM), rather than when the SUA is actually being used (or when it is being used to lower altitudes). This would result in flight plans filed at FL260[4] and below through DOLUR being regularly and unnecessarily rejected in IFPS.
- Introduce an ATM procedure to apply the buffer tactically. A Minimum Safe Flight Level would be used tactically to ensure the appropriate separation between GAT and EG D008A is achieved. This considers the prevailing meteorological conditions and provides a proportionate method of adhering to CAA policy. In addition, it minimises the impact to GAT and can be applied when EG D008A is actually being used to 22,000ft.

The preferred and proposed method to apply the required buffer between aircraft on a FRA trajectory within the region and EG D008A is to introduce an ATM procedure.

## 7.5 General Aviation (GA) airspace users

There is not expected to be any impact on general aviation or sport aviation airspace users.

## 7.6 Commercial Airlines

There is expected to be a positive impact on the operations of commercial airlines. FRA will enable increased flexibility in flight planning. Flight plans will more closely reflect the trajectories flown (subject to RAD restrictions). As such there may be benefits in reduced distances flown and reduced associated fuel uplift requirement.

3 To comply with CAA Special Use Airspace - Safety Buffer Policy for Airspace Design Purposes

[4] Pre-tactical ASM process applies an additional buffer of 1,500ft to the upper level of a SUA where it is defined as an altitude. This caters for pressure differences between the QNH and SAS. For exact impact depending on QNH in use refer to AIP ENR 1.7 Flight Level Graph.

## 7.7 Impact on Aviation Safety

The DSNA Brest ACC FRA airspace design[5] removes the ATS route structure and would manage traffic flows through the use of flight planning restrictions in the RAD. This approach is common with other FRA implementations within the ICAO EU region and the AMS. Therefore, a qualitative high-level safety appraisal for the two proposed options for FRA deployment in the region indicates that the existing level of safety performance would be maintained.

There is an extant process for safety assessing any change that may have an impact on neighbouring ANSPs through the ATS delegation agreement.

## 7.8 Reversion Statement

Should the proposal be approved and implemented, depending on the Option implemented, reversion to the pre-implementation state would be:

- FRA Option 1. (In which all ATS routes are removed) – Complex and very difficult
- FRA Option 2. (In which an ATS route structure is maintained in the TAKAS Box) – Complex and very difficult

Due to the removal of ATS Routes and the impact to neighbouring ANSP, the changes proposed by option 1 and 2 would permanently and significantly change the airspace structure, hence making reversion complex and extremely difficult.

In the unlikely event that there are unexpected issues caused by this proposal, then short notice changes could be made via NOTAM or by adding Route Availability Document (RAD) restrictions. For a permanent reversion, the changes would have to be reversed by incorporating this into an appropriate future AIRAC date. Due to the limitations of NATS Area System (NAS - flight and radar data processing) large scale airspace changes are only implemented four times a year.

[5] The IAA already operate FRA (fulfilling the PCP mandate). The IAA have stated that they are content to change the airspace within the TAKAS box in accordance with Brest ACC's airspace requirements and timeline.

# 8 How to respond to this consultation

The consultation begins on 11th January 2021 and ends on 8th February 2021, a period of 4 weeks.

Consultation material is available on the CAA's airspace change consultation portal at:

https://consultations.airspacechange.co.uk/nats/fra-d2-1

The list of stakeholders targeted for this consultation is given in Appendix A. These stakeholders have been directly informed of this consultation.

The consultation is not limited to these stakeholders – we welcome feedback from any individual or organisation.

A feedback questionnaire is provided on the consultation portal and is summarised in Appendix B.

It is recommended (and preferred by the CAA) that responses are made via the portal.

Submissions via the portal are sent direct to the CAA. Supporting documents may also be submitted via the portal.

Please note that when submitting feedback, you will be asked to provide the following information:

- Your name, and your role if you are responding on behalf of an organisation.
- Your contact details (email)

If this proposal does not affect your operation, please respond as that fact itself is useful data.

Note that all responses go direct to the CAA who will moderate submissions. Responses will be publicly visible by being published on the CAA airspace change portal subsequent to submission.

At this time we are unable to accept postal responses to this consultation. The precautionary measures taken by NATS in response to the COVID-19 pandemic means that we cannot guarantee we would be able to access postal returns and therefore consider them within this proposal.

# 9 Compliance with process, and what happens next

## 9.1 Compliance

If you have questions or comments regarding the conduct of the airspace change process (e.g. adherence to CAP1616 (Ref 5)), please contact the CAA:

Airspace Regulation
Ref: NATS FRA-D2.1 ACP-2020-039
Safety and Airspace Regulation Group
Aviation House
Beehive Ring Road
Crawley
West Sussex
RH6 0YR

airspace.policy@caa.co.uk

Form FCS 1521 can be used for this purpose

Note: These contact details must not be used for your response to this consultation. If you do so, your response may be delayed or missed out.

## 9.2 What happens next?

When the consultation period closes, we will publish a report summarising the feedback received.

We will then assess the responses and determine if we need to update our airspace design based on the feedback received. If a significant amendment is required, we may need to re-consult on the modified airspace design option.

We will then submit an Airspace Change Proposal to the CAA based on this consultation document and the feedback report.

The CAA will then study the proposal to decide if it has merit and will publish a decision on its website.

If the CAA approves this proposal, we plan to implement the changes on 2nd December 2021 (AIRAC 12/2021).

# 10 References


1. Borealis Free Route Airspace Concept of Operations v1.0
2. CAA Airspace Modernisation Strategy (CAP 1711)
   (Relevant Sections: Upper Airspace Section 4)
3. FRA Deployment 2.1 - Design Options and Design Principle Evaluation
4. FRA Deployment 2.1 - Options Appraisal (Phase II – Full) including safety assessment
5. CAP1616 Airspace Design: CAA Guidance on regulatory process for changing airspace design.
6. Route Availability Document:
7. Aeronautical Information Publication (AIP)

# 11 Glossary of Terms

| | |
|---|---|
| ACC | Area Control Centre (there are two ACCs in the UK, Swanwick and Prestwick) |
| ACP | Airspace Change Proposal |
| AIP | Aeronautical Information Publication (where airspace and route definitions are published) |
| ANSP | Airspace Navigation Service Provider |
| AOR | Area of responsibility |
| ATC | Air Traffic Control |
| ATS | Air Traffic Services |
| Baseline | 'As is' situation against which proposed changes are measured |
| Borealis Alliance | Alliance amongst north-west European Air Navigation Service Providers to drive better performance for stakeholders through business collaboration. The Alliance includes the ANSPs of Denmark, Estonia, Finland, Iceland, Ireland, Latvia, Norway, Sweden and the UK. |
| CAA | the UK Civil Aviation Authority |
| CAP | Civil Aviation Publication (publications produced by the CAA) |
| CONOPS | Concept of operations |
| D1 | deployment one, the first deployment of FRA across the area shown in Figure 1. |
| DCT | (Direct) Waypoint to waypoint routing, which does not use an airway. |
| DSNA | Direction des Services de la Navigation Aérienne (French ANSP) |
| Eurocontrol | European Organisation for the Safety of Air Navigation; with 41 members it seeks to achieve safe and seamless air traffic management across Europe. |
| FAB | Functional Airspace Block. (e.g. the UK + Ireland airspace is agreed as a FAB) |
| FBZ | Flight Plan Buffer Zones – areas for flight planners to avoid to provide separation from Special Use Airspace. |
| FDPS | Flight Data Processing System |
| FIR | Flight Information Region (Airspace below FL255) |
| FL | Flight level, the altitude reference which aircraft use at higher altitudes using standard pressure setting, essentially units of 100ft, i.e. FL255 equates approximately to 25,500ft |
| FMC/FMS | Flight Management Computer/Flight Management System |
| FRA | Free Route Airspace |
| GA | General Aviation |
| IAA | Irish Aviation Authority |
| ICAO | International Civil Aviation Organisation – an agency of the United Nations. |
| IFPS | Integrated Flight-plan Processing System |
| LAMP | London Airspace Modernisation Programme; established to redesign the airspace in and around the London TMA region, providing a more efficient airspace design, modernising the route structure and making better use of aircraft and ATC technologies. |
| MoD | Ministry of Defence |
| MTCD | medium term conflict detection. Generic term for any ATC tool which looks ahead and predicts when aircraft are likely to be in conflict |
| NATMAC | National Air Traffic Management Advisory Committee |
| NDB | Non-Directional Beacon (radio navigation beacon) |
| NM | Network Management |
| NPZ | No Planning Zone – area where a flight plan is not permitted to enter at all or only when meeting prescribed criteria. |
| PCP | SESAR Pilot Common Project. |
| PBN | Performance Based Navigation – international requirements which standardise accuracy, safety and integrity for satellite navigation systems. |
| RAD | Route Availability Document: contains the policies, procedures and descriptions for route and traffic orientation. Includes route network and free route airspace utilisation rules and availability. |
| SESAR | Single European Sky ATM Research A collaborative project to completely overhaul European airspace and its air traffic management |
| SID | Standard Instrument Departure. |
| SRD | Standard Routing Document |
| STAR | Standard Terminal Arrival Route |
| SUA | Special Use Airspace – areas designated for operations of a nature that limitations may be imposed on aircraft not participating in those operations (i.e. military training areas) |
| TMA | Terminal Manoeuvring Area |
| UIR | Upper Information Region (Airspace above FL255) |
| VOR | VHF Omnidirectional Range (radio navigation beacon) |
| WebTAG | Department of Transport's web-based Transport Analysis Guidance; provides information on the role of transport modelling and appraisal, and templates for analysis (e.g. for Greenhouse gas emissions, and noise). |

# Appendix A List of Stakeholders

| | | |
|---|---|---|
| **Airlines** | DHL | Lufthansa |
| Aer Lingus | Eastern Airways | Qatar Airways |
| Air Canada | EasyJet | Ryanair |
| Air France | Emirates | SAS |
| Air New Zealand | Etihad | Saudia |
| American Airlines | FedEx | Stobart Air |
| Austrian Airlines | FinnAir | Tag Aviation |
| BA Cityflyer | Gamma Aviation | Thomson/ TUI |
| BAR | Gulf Air | Turkish Airlines |
| British Airways | Iberia | UK Air Tanker |
| Cityjet | Jet2 | United Airlines |
| Cargolux | KLM | Virgin Airlines |
| Delta Airways | Logan Air | WizzAir |
| **Air Navigation Service Providers (ANSPs)** | | |
| Direction des Services de la Navigation Aérienne (DSNA) (France) | Eurocontrol Central Flow Management Unit (CFMU) | |
| DSNA ACC Brest (France) | Irish Aviation Authority (IAA) (Ireland) | |
| DSNA ACC Reims (France) | RAF(U) Swanwick (UK Royal Air Force) | |
| **Computerised Flight Plan Service Providers** | | |
| Air Support | Jeppesen | |
| Aviation Cloud | Lufthansa Systems | |
| Flight Keys | NavBlue | |
| Lido | Sabre | |
| **National Air Traffic Management Advisory Committee (NATMAC) Members** | | |
| Aviation Environment Federation (AEF) | British Helicopter Association (BHA) | |
| Airport Operators Association (AOA) | European UAV Systems Centre Ltd | |
| Aircraft Owners & Pilots Association (AOPA UK) | General Aviation Safety Council (GASCo) | |
| Association of Remotely Piloted Aircraft Systems (ARPAS UK) | General Aviation Alliance (GAA) | |
| British Airways (BA) | Guild of Air Traffic Control Officers (GATCO) | |
| British Aerospace Systems (BAE Systems) | Helicopter Club of Great Britain (HCGB) | |
| British Airline Pilots Association (BALPA) | Heathrow Airport Ltd | |
| British Air Transport Association (BATA) | Heavy Airlines | |
| British Balloon & Airship Club (BBAC) | Honourable Company of Air Pilots | |
| British Business & General Aviation Assoc (BBGA) | Light Aircraft Association (LAA) | |
| British Gliding Association (BGA) | Light Airlines | |
| British Hang Gliding & Paragliding Assoc (BHPA) | Low Fares Airlines (LFA) | |
| British Microlight Aircraft Association (BMAA) | Ministry of Defence (MoD) via the Defence Airspace and Air Traffic Management (DAATM) | |
| British Model Flying Association (BMFA) | PPL/IR | |
| British Parachute Association (BPA) | | |
| **Other** | | |
| Direction de la Sécurité de l'Aviation Civile (DSAC) | Irish Aviation Authority Regulator | |
| Direction du Transport Aérien (DTA) | Irish Air Corps | |
| French Air and Space Force | United Kingdom Space Agency (UKSA) | |

# Appendix B Consultation Questions

The feedback we receive from this consultation is very important to us. It is a key factor in shaping the final airspace change proposal and it provides us with assurance that we have considered the needs of those who would be impacted by this change. We are therefore asking a series of questions about our proposed options that will help us to understand your views.

These questions do not ask your opinion on the do-nothing option. This option was discounted during the design principles evaluation, so we ask you to understand that we seek your opinions on Option 1 and Option 2.

Please respond to this consultation using the feedback form published on the CAA Website here.

If you wish your response to be published anonymously, your personal details (Name, Address & Position) will be redacted prior to publication and will only be seen by NATS and the CAA[6].

☐ : YES, I want my response to be published with my details (please fill in below)

☐ : NO, I want my response to be published anonymously

Name: _____

Representing (Self or an Organisation): _____

Role (If representing an Organisation) _____

Email: _____

Question

To what extent do you agree that Option 1 is an acceptable solution to introduce FRA within the PEMAK Triangle and TAKAS Box?

☐ : Strongly agree

☐ : Agree

☐ : Neither agree nor disagree

☐ : Disagree

☐ : Strongly Disagree

Question

To what extent do you agree that Option 2 is an acceptable solution to introduce FRA within the PEMAK Triangle and TAKAS Box?

☐ : Strongly agree

☐ : Agree

☐ : Neither agree nor disagree

☐ : Disagree

☐ : Strongly Disagree

[6] This may include 3rd party contractors.

### Question

To what extent do you agree with the proposed waypoint rationalisation?

☐ : Strongly agree

☐ : Agree

☐ : Neither agree nor disagree

☐ : Disagree

☐ : Strongly Disagree

Please briefly explain your answer to Question 4

### Question

To what extent do you agree with the proposed method of adhering to the CAA Special Use Airspace – Safety Buffer Policy for Airspace Design Purposes?

☐ : Strongly agree

☐ : Agree

☐ : Neither agree nor disagree

☐ : Disagree

☐ : Strongly Disagree

Please briefly explain your answer to Question 5

### Question

Do you prefer Option 1 or Option 2?

☐ : Option 1

☐ : Option 2

☐ : No preference

Please briefly explain your answer to Question 3

### Question

If you have any other comments you would like to make please provide your feedback here:

_____
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You may include a letter or other document if you wish.

Thank you for your time.

End of document