

# TAG FARNBOROUGH AIRPORT AIRSPACE CHANGE PROPOSAL

CAP 1678

A large, abstract graphic composed of overlapping, semi-transparent blue shapes in various shades, ranging from light cyan to deep navy blue, creating a dynamic, layered effect that fills the bottom two-thirds of the page.

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# Contents

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Contents.....	3
<b>Chapter 1.....</b>	<b>6</b>
Executive summary.....	6
The Proposal.....	6
Summary of the draft decision made.....	7
Reasons.....	8
Next steps.....	9
<b>Chapter 2.....</b>	<b>11</b>
Decision Process and Analysis.....	11
CAA’s Role.....	11
Aims and Objectives of the proposed change – CAA decision on objective.....	11
Chronology of Proposal Process.....	12
Documents considered by the CAA.....	13
CAA Analysis of the Material provided.....	15
CAA assessment and decision in respect of Consultation.....	15
CAA Consideration of Feedback received from airspace users including those in the General Aviation Community.....	17
CAA Consideration of Factors material to our decision whether to approve the change.....	19
Explanation of statutory duties.....	19
Conclusions in respect of safety.....	20
Conclusions in respect of securing the most efficient use of airspace.....	24
Conclusions in respect of taking into account the Secretary of State’s guidance to the CAA on environmental objectives.....	25
Conclusions in respect of environmental impact.....	32

Conclusions in respect of aircraft operators and owners.....	33
Conclusions in respect of the interests of any other person .....	36
Integrated operation of ATS .....	37
Interests of national security.....	37
International obligations .....	37
<b>Chapter 3.....</b>	<b>38</b>
CAA’s Regulatory Decision .....	38
<b>Annex A.....</b>	<b>40</b>
Undertakings .....	40
Undertakings given by Farnborough .....	40
<b>Annex B.....</b>	<b>41</b>
Diagrams relating to change .....	41
Description of revisions between Figure 3 (above) and Figure 4 (below) .....	44
<b>Annex C.....</b>	<b>47</b>
The CAA’s role in airspace change decisions, the legal framework, the policy background and relevant UK international obligations .....	47
The seven-stage process of an airspace change .....	54
UK’s International Obligations relating to Performance-Based Navigation.....	58
<b>Annex E.....</b>	<b>60</b>
CAP 725 Chronology for this proposal .....	60
Framework Briefing .....	60
Consultation .....	60
<b>Annex F .....</b>	<b>63</b>
CAA Analysis of the Material provided .....	63
<b>Annex G .....</b>	<b>65</b>
Analysis of Stakeholder feedback received by the CAA.....	65

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<b>Annex H</b> .....	<b>112</b>
UK's work on Conspicuity.....	112
Background.....	112
<b>Annex I</b> .....	<b>115</b>
Access Arrangements open to all.....	115
<b>Annex J</b> .....	<b>119</b>
Glossary .....	119

## Chapter 1

## Executive summary

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### The Proposal

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1. The airspace change proposal (“the ACP”) is to create a new operating environment with RNAV standard instrument departures (SIDs) & standard terminal arrival routes (STARs) and elements of controlled airspace.
2. The Change Sponsor justifies the ACP on the basis that it will:
  - a. Bring benefits to the Change Sponsor’s ATC operation and to other airspace users in the region.
  - b. Enhance aviation safety.
  - c. Reduce noise impact on the local population.
3. The objectives the Sponsor seeks to achieve through the ACP to support the above justification are:
  - a. To increase the predictability and efficiency of departure and arrival routes.
  - b. To reduce the complexity of aircraft interactions.
  - c. To establish a route structure that, as far as practicable:
    - i. Avoids towns and villages below 4,000ft; and
    - ii. Avoids major population centres between 4,000ft and 7,000ft.
  - d. To encourage the general aviation community to use the Change Sponsor’s air traffic services.
4. The Sponsor has also said the ACP aims to maintain a high standard of safety, improve the overall efficiency of the airspace for all users, provide equitable access to airspace to all users and lessen the environmental impact by reducing over-flight of populated areas at low altitude where possible. Additionally, the sponsor says the procedures aim to provide an efficient routeing for Farnborough departures and arrivals, connect to the

southeast England en-route airspace structure and to deconflict Farnborough aircraft from the adjacent Heathrow and Gatwick operations.

## **Summary of the draft decision made**

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5. The CAA does not approve the proposal to change airspace design wholly in the form proposed by the Sponsor set out in the documents listed below. However, in accordance with Direction 5(2) of the CAA Air Navigation Directions 2017, the CAA may make its approval of a proposal subject to such modifications and conditions as the CAA considers necessary. On the basis that the Sponsor will give the undertakings set out in Annexe A, the CAA has decided to approve the ACP with the modifications described in Appendix B – Figure 4. The CAA will allow the Sponsor a short period of time in which to decide whether it would rather withdraw its proposal than implement the ACP as modified which the CAA approves. The proposal as modified (“the Modified ACP”) is:

- A Class D control zone (CTR) and Class D and Class E+ transponder mandatory zone (TMZ) control areas (CTAs).
- 
- The combination of Class A controlled airspace (CAS) LTMA 11 and LTMA 12 into a revised LTMA 11 with a base altitude 4500 feet and extend the southerly boundary of the revised LTMA 11 by one mile
- Within the CTR and CTAs, RNAV1 SIDs and STARs.
- 
- New initial approach procedures (IAPs) at the end of the STAR to connect the en-route phase of flight to the final approach to the runway.

(An explanation of the difference between the ACP and the Modified ACP is set out below).

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## Reasons

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6. The CAA has concluded that the Modified ACP maintains a high standard of safety in a congested area of airspace used by a wide variety of airspace users and aircraft that will benefit from changes to airspace design that create a known environment and that the classification of airspace approved combined with the access arrangements open to all radio equipped aircraft mean the changes will not create a detrimental effect on safety in surrounding remaining Class G airspace, in particular the changes will not create the detrimental effect on safety referred to as "bottle-necks" in surrounding remaining Class G airspace.
7. The CAA has concluded that the Modified ACP will make the most efficient use of airspace because the airspace design we have decided to approve will increase the overall number of aircraft that can safely use the airspace. The CAA has concluded that the Modified ACP will enable all aircraft to benefit from the expeditious flow of traffic because IFR traffic will now be able to flight plan using SIDs and STARs and are less likely to be re-routed due to risk of conflict with an unknown aircraft.
8. The CAA has concluded that that the Modified ACP combined with the access arrangements open to all to accept represents the most equitable means of satisfying the requirements of the operators and owners of all classes of aircraft whilst at the same time achieving the important benefits of the proposal.
9. The CAA has taken into account the environmental impact of the change as set out in this decision and has concluded that when considering all of the CAA's statutory duties as a whole it is reasonable proportionate and the right decision to approve the proposal.
10. The CAA has considered alternatives proposed by GA stakeholders. These proposals were not treated as an airspace change proposal as they had not followed the process a sponsor must follow to propose a change to airspace design to the CAA (CAP 725). Nonetheless careful consideration has been given to whether any of the alternatives proposed or the information in the alternatives proposed means the ACP should be modified



in any of the ways proposed. The CAA has concluded it should not. The CAA has concluded that the design proposed is unfeasible due to the effect on Gatwick and Heathrow and that the design proposed is so different to that being considered by the CAA in this proposal that it could not be dealt with by way of a modification but would need to be proposed as an alternative proposal developed in accordance with the CAA's airspace change process.

## Next steps

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11. The CAA requires the Sponsor to advise the CAA whether it wishes to proceed to implement the Modified ACP approved by the CAA or to withdraw its proposal by 18 July 2018. The modifications are presented in Appendix B – Figure 4. We will publish the Sponsor's response in this regard on our website.
12. On the basis that the Sponsor agrees and proceeds with the steps necessary to implement the change, and before implementation, Farnborough ATC and NATS (NERL) TC must complete final endorsement of any further CONOPS and produce Supplementary Instructions that include Hazard Analysis and an Impact Assessment identifying any risks and mitigations that would be required before final validation of the airspace structure
13. The CAA's Post Implementation Review (PIR) of the Modified ACP approved by the CAA in this decision will commence at least one year after implementation of those changes. The PIR is the seventh stage of the CAA's airspace change proposal process and will consider whether the anticipated impacts and benefits, set out in the Airspace Change Proposal, have actually been delivered. The policy states that if those impacts and benefits have not been delivered then the review should "*ascertain why and ... determine the most appropriate course of action*".<sup>1</sup> (See [Annex C])

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<sup>1</sup> There are therefore a wide range of possibilities for the conclusions of a PIR; they include a rejection of the proposal, the imposition of further requirements on the proposal, and the making of wider recommendations, albeit that the success of the proposal is not dependent upon them.

paragraph 22 for more information.) the CAA will also consider whether the improvements anticipated by the modification to the ACP have actually been delivered in the same way.

14. It is a condition of the CAA's approval that the Sponsor provides data required by the CAA throughout the year following implementation to carry out that PIR. The specific data sets and analysis required, and the dates by when this information must be provided will be published on our website shortly. Together with other data, the Sponsor will be expected to provide the CAA with accurate detail on the number of requests for service and the number of refusals of service to GA aircraft that have occurred over the 12-month period. In addition, the CAA will contact GA stakeholder groups to assess the efficacy of the GA/VFR access arrangements to help determine whether the airspace change has delivered what it set out to achieve.

## Chapter 2

## Decision Process and Analysis

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### CAA's Role

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#### **The CAA's role in airspace change decisions, the legal framework, the policy background and relevant UK international obligations**

15. It is necessary to understand the CAA's role in airspace change decisions, the legal framework, the policy background and relevant UK international obligations in order to understand the decision[s] the CAA has taken.
16. This information is set out in Annex C.

### **Aims and Objectives of the proposed change – CAA decision on objective**

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17. The proposed change, its justifications and objectives are summarised in Chapter 1 and set out in full in the Sponsor's documents submitted to the CAA. These are published on the CAA's website. These include improving safety and reducing low overflight of populated areas. Additionally, at present, it is sometimes necessary that IFR operations departing or arriving at Farnborough be given an air traffic control re-routeing that deconflicts from unknown conflicts (that is aircraft using the airspace whose identity is not known and who are not communicating with air traffic control) in Class G uncontrolled airspace. Farnborough submit that Class D CAS would provide a known air traffic control environment which would remove the need for such separation and thereby increase the efficiency of the use of this airspace, and therefore enable an increased overall throughput for this airspace. Farnborough submit the proposals would enable Farnborough operations to accommodate the anticipated growth in IFR movements.
18. Sponsors seeking to introduce new departure and arrival procedures at aerodromes are required to comply with the International requirements that

mandate a PBN policy whereby all new instrument flight procedures are designed to an ICAO standard RNAV specification. Accordingly, an objective of the proposal is to introduce new procedures in a way that enables the UK to meet its international obligations.

19. In this part of the record of the CAA's decision, the CAA formally records that these aims and objectives of the change proposed are objectives which it endorses and, subject to the terms of the regulatory and policy framework set out in [Annex C], the CAA will seek to approve changes to the UK airspace structure that meet the aims and objectives of this proposal.

## **Chronology of Proposal Process**

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20. The chronology of the process is set out in Annex E. Notwithstanding that the CAA introduced a new airspace change process on 2 January 2018 (known as CAP 1616) this ACP has been developed and is assessed in accordance with the CAA's airspace change process known as CAP 725. This is in accordance with a transition policy developed with the Department for Transport and consulted on in 2016 and confirmed in 2017.
21. The ACP is set out in ACP issue 1.0 (July 2015) as revised by option 38 (December 2016).
22. The CAA has concluded that the proposal submitted, as revised by Option 38, could be amended so as to achieve the objectives of the change but better reflect all the material factors that the CAA is required to consider when making a decision to change the design of airspace. As such, the CAA approves the ACP but with modifications, so that the proposal (as already revised by Option 38) is modified such that the airspace referred to as CTA8 and CTA9 be classified as Class E<sup>2</sup> airspace together with Transponder Mandatory Zones (TMZs) ("the Modified ACP"). By contrast, the ACP was for CTA8 and CTA9 to be Class D airspace. The CAA has

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<sup>2</sup> The CAA is currently undertaking a review of operating procedures in Class E airspace. In due course this will require air traffic control to use a specific Farnborough airspace frequency monitoring code. This work is ongoing and there is no target implementation date yet to.

concluded that the revision to the ACP made by the Modified ACP will involve the same or improved impact for all stakeholders when compared to the ACP (the July 2015 airspace change proposal as revised by Option 38) already consulted on, and that for this reason it is proportionate to proceed to a decision now, without a need for further consultation. The CAA has given careful consideration to the legal requirements surrounding consultation in reaching this view. For the avoidance of doubt, it would not be proportionate to require the Sponsor to go back and complete any part of Stage 1-4 of CAP 725 again, including it being not necessary nor proportionate to require the Sponsor to consult on what is referred to as the Modified ACP (Option 38, with Class E + TMZ).

## Documents considered by the CAA

23. In assessing the proposal and making this decision, the CAA has taken account of the following documents received from the Sponsor:
- a. Farnborough ACP (Option 25) Consultation documents - Parts A-F, dated 3 February 2014
  - b. Farnborough ACP Feedback Report Part A
  - c. Farnborough ACP Feedback Report Part B
  - d. Farnborough ACP (Option 34) Issue 1.0, dated 3 July 2015
  - e. Farnborough ACP Appendix A Comms, Nav and Surveillance
  - f. Farnborough ACP Appendix B Safety in the Vicinity of Farnborough airport
  - g. Farnborough ACP Appendix C CAS Containment and Separation
  - h. Farnborough ACP Appendix D Real Time Simulation
  - i. Farnborough ACP Appendix E AIP Pages Affected
  - j. Farnborough ACP Appendix F Fuel, CO<sub>2</sub>, Air Quality
  - k. Farnborough ACP Appendix G Flight Validation
  - l. Farnborough ACP Appendix H PDG
  - m. Farnborough ACP Appendix I LoA Drafts
  - n. Farnborough ACP Appendix J Stakeholder Reengagement Examples

- o. Farnborough ACP Appendix K Consultation (see a, b, c above)
- p. Farnborough ACP Appendix L Disruption and Delay examples
- q. Farnborough ACP Appendix M Heathrow SID Gradients
- r. Farnborough ACP Appendix N GA Levels Analysis
- s. Farnborough ACP Appendix O Concept of Operations
- t. Farnborough Airport Additional Consultation (Option 36), dated 10 August 2016
- u. TAG Farnborough Feedback Report Part C (Option 38)
- v. Letter Sponsor to CAA dated 4 September 2017 regarding airspace access arrangements

24. In assessing the proposal and making this decision, the CAA has taken account of the following documents produced by CAA:

- a. Farnborough ACP Meetings Report (CAA), dated 21 December 2016 (which includes a document submitted by stakeholders as an alternative airspace design)
- b. Farnborough ACP Operational Assessment Annex C (Case Study)
- c. Farnborough ACP Consultation Assessment Annex D
- d. Farnborough ACP Addendum Consultation Assessment Annex D
- e. Farnborough ACP Environmental Assessment Annex E
- f. Farnborough ACP Review of material submitted by GA (embedded in document (a))

25. In assessing the proposal and making this decision, the CAA has taken account of the following documents sent to the CAA by third parties:

- a. FASVIG Future Airspace Strategy Report dated 13 May 2016
- b. General Aviation Revised Airspace Design dated 20 December 2016
- c. Southdown GC response to TAG Farnborough dated 27 December 2016
- d. The Royal Aero Club Letter dated 2 January 2017
- e. Correspondence and other documents received by the CAA from MPs, representative organisations and individuals

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## CAA Analysis of the Material provided

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26. As a record of its analysis of the ACP, the CAA has produced an Operational Assessment, an Environmental Assessment and Consultation Assessments and Report on Additional Material provided to Airspace Regulation (see Annex G). A description of the purpose and contents of those documents is in Annex F.

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## CAA assessment and decision in respect of Consultation

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### Two consultations

27. The Sponsor undertook two consultations as part of this airspace change proposal. The first consultation took place between February and May 2014 (on what is referred to as Option 25, See Annexe B – Figure 1) before the proposal (by then referred to as Option 34) was submitted to the CAA in July 2015. There were changes to the airspace design between consultation and the submission of the proposal to the CAA in July 2015. Those changes generally resulted in a reduction in the volume of controlled airspace proposed. As a consequence, the CAA did not require a consultation on the revised design before the proposal was submitted to the CAA for consideration.
28. As set out in the chronology of the development of this proposal in Annex F an operational issue was discovered during simulation of the procedures (which formed part of the CAA's safety assessment of the proposal) in July 2016; it was determined that in order to maintain a high standard of safety the arrival routes in the proposed airspace design needed to be moved further west to ensure safe interaction between Farnborough arrivals and some Gatwick departures. After the Sponsor revised the airspace design to incorporate an amendment of the arrival procedures, the CAA initially required an additional consultation on the revisions (referred to as Option 38) with a consultation period of 8 weeks. Following feedback from stakeholders, the Sponsor extended the period to 12 weeks, taking place in autumn 2016.

**CAA assessment of the consultations**

29. The initial consultation was comprehensive and well-publicised utilising press and news releases and was broadly publicised in aviation sector publications. The Sponsor also attended a large number of public meetings to present its proposals. The consultation generated a large number of responses from both aviation and non-aviation stakeholders. The CAA has reviewed the documentation, and the CAA is content that someone reading the initial consultation would have been able to understand the anticipated impact of the proposal on them.
30. Following the initial consultation, the Sponsor produced two Feedback Reports, A and B. Feedback Report A detailed the level of response and issues that had been raised. Feedback Report B constituted a rigorous analysis of the consultation responses and highlighted a number of steps that the Sponsor was taking to address the issues raised during the consultation. These included a redesign of the departure routes, a redesign of an arrival route and a reduction in the volume of controlled airspace proposed. The CAA is content that the Sponsor took into account the initial consultation feedback.
31. For the additional consultation, the Sponsor contacted 24 Parish Councils directly as well as local and national aviation stakeholders (including NATMAC). Public meetings were held in Midhurst on 1st and 20th September 2016. In addition, there was widespread press coverage of the additional consultation. The consultation generated a large number of responses from both aviation and non-aviation stakeholders. The CAA has reviewed the documentation, and the CAA is content that someone reading the additional consultation would have been able to understand the anticipated impact of the proposal on them.
32. A number of objections were made to the proposal including in relation to environmental impact, access to the proposed airspace and safety, which the Sponsor addressed either through amendments to the proposal or clarification on how the proposal would impact stakeholders, detailed in



[Feedback Report C]. The CAA is content that the Sponsor took into account the additional consultation feedback.

### **Engagement with other airspace users relating to access arrangements for the proposed airspace**

33. In addition to the consultation and engagement activity undertaken described above, several meetings between the Sponsor and GA representatives were facilitated by the CAA, with input from FASVIG, to explore options for access arrangements and the flexible use of airspace to see if agreement could be reached. These meetings were unsuccessful in their objective.<sup>3</sup>
34. The CAA's full assessment of the consultation is contained in the CAA's Consultation Assessments referred to above and published on the CAA's website. In summary, the CAA has concluded that the quality of the Sponsor's consultation and response to consultation feedback was sufficient for the CAA to proceed to consider whether to approve the change requested.

### **CAA Consideration of Feedback received from airspace users including those in the General Aviation Community**

35. In addition to participating in the formal consultations within the CAP 725 process, many stakeholders, including those in the GA community, provided feedback direct to the CAA regarding this proposal. The CAA has taken all of that feedback into consideration.
36. In May 2016 the CAA received the FASVIG Future Airspace Strategy Report (dated 13 May 2016). After considering the contents of this document, together with its review of the CONOPs report submitted by the Sponsor, the CAA paused its assessment of the proposal in October 2016 (which is set out in more detail in the Chronology of this proposal in Annexe E) which led ultimately to a revision by the Sponsor of the proposal.

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<sup>3</sup> These meetings did result in GA representatives suggesting an alternative airspace design that they asked the CAA to consider instead of or alongside the design proposed by Farnborough. This is dealt with below

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37. During the period when the CAA's assessment of the proposal had paused in 2016, the CAA facilitated discussions between airspace users affected by the proposal and the Sponsor (See more detail in Annexe E).
38. After those meetings, a document entitled Revised Airspace Design (see Annex G) was sent to the CAA on behalf of and with the support of many of the airspace users in the GA community. The CAA advised that this could not be accepted as an alternative airspace change proposal because it had not been developed in accordance with our process (then CAP 725). However, it was analysed in detail by the CAA. The CAA also received Southdown Gliding Club's submission dated 27 December 2016 and a letter from The Royal Aero Club dated 2 January 2017. The additional material and CAA's report on it are in Annexe G. In summary, consideration was given to whether that material contained any elements that would lead the CAA to consider that the proposal under consideration in this case should be rejected, or approved but with modifications or conditions. The proposals in the GA documents included a design for a CTR and CTAs of reduced size and SIDs which climbed into the LTMA further east compared to those proposed by the Sponsor. The CAA concluded that this would not be feasible due to the impact this would have on other stakeholders; the GA Revised Design relied on using levels of the LTMA currently used by Gatwick and Heathrow airports. The design proposed by the Sponsor had already taken into consideration the requirements of Gatwick and Heathrow's procedures which are contained within the LTMA.
39. Furthermore, even had the CAA considered the changes proposed in the GA Revised Airspace Design as feasible, the CAA considers it would not have been able to incorporate this design into this proposal; the difference between the proposal being considered by the CAA and the changes suggested by the GA Revised Design would be so significant as to require an entirely new ACP.

## CAA Consideration of Factors material to our decision whether to approve the change

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### Explanation of statutory duties

40. Pursuant to the Civil Aviation Authority (Air Navigation Directions) 2017 Direction 5 it is one of the CAA's air navigation functions to decide whether to approve a proposal for a permanent change to airspace design. By Direction 5(2) the CAA may make its approval of a proposal subject to such modification and conditions as the CAA considers necessary. The CAA's statutory duties when carrying out its functions under Direction 5 are contained in Section 70 of the Transport Act 2000 (the Transport Act). Those duties include taking account of Guidance to the CAA on Environmental Objectives relating to the exercise of its air navigation functions. In accordance with guidance given to the CAA by the Secretary of State, the version of Guidance on Environmental Objectives relevant to consideration of this proposal is the 2014 Guidance.<sup>4</sup>
41. These functions, the law and policy framework in which they are carried out are set out in more detail in Annex C. In summary, the CAA's primary duty under Section 70(1) of the Transport Act requires that the CAA exercises its air navigation functions so as to maintain a high standard of safety in the provision of air traffic services. This duty takes priority over the application of Section 70(2) and Section 70(3).
42. Where an airspace change proposal does not conflict with any of the sub-paragraphs of Section 70(2), the CAA will, subject to exceptional circumstances, approve the airspace change proposal.
43. Where an airspace change proposal satisfies some of the sub-paragraphs in Section 70(2) but not others, this is referred to as a conflict within the meaning of Section 70(3).

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<sup>4</sup> Revised in 2014 by the Department for Transport  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/269527/air-navigation-guidance.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/269527/air-navigation-guidance.pdf)

44. In the event of a conflict, the CAA will apply the matters set out in Section 70(2) in the manner it thinks is reasonable having regard to them as a whole, in accordance with Section 70(3).
45. The CAA will give greater weight to Section 70(2) sub-paragraphs that require it to “secure” something than to those that require it to “satisfy” or “facilitate” something.
46. The CAA regards the term to “take account of” as meaning that the material considerations in question may or may not be applicable in a particular case and the weight the CAA will place on such material considerations will depend heavily on the circumstances of the individual case, as well as the nature of the particular material consideration the CAA is to “take account of”. The analysis of the application of the CAA’s statutory duties in this airspace change proposal is set out below.
47. The CAA also has other statutory duties of potential relevance here, such as the duty to have regard to the purposes of National Parks, and has had regard to those duties (and see the 2014 Guidance for those other duties).

## Conclusions in respect of safety

48. The CAA’s primary duty is to maintain a high standard of safety in the provision of air traffic services and this takes priority over all other duties.<sup>5</sup> In this respect, with due regard to safety in the provision of air traffic services, the CAA is satisfied that the modified ACP maintains a high standard of safety for the following reasons.
49. The Farnborough Approach Radar ATCO’s are currently required to routinely provide a deconfliction service, as described within CAP 4936 and

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<sup>5</sup> Transport Act 2000, Section 70(1).

<sup>6</sup> **Cap 493 – The Manual of Air Traffic Services Part 1**

*Standard vertical or horizontal separation **shall** be provided, between:*

*IFR flights in Class C, D and E airspace;*

*IFR flights and Special VFR flights*

*Special VFR flights*

*Separation standards are not prescribed for application by ATC between VFR flights or between VFR and IFR flights in Class D airspace. However, ATC has a responsibility to prevent collisions between known flights and to maintain a safe, orderly and expeditious flow of traffic.*

*Instructions issued to VFR flights in Class D airspace are mandatory. These may comprise routeing instructions, visual holding instructions, level restrictions, and information on collision hazards, in*

CAP 7747, aimed at providing a planned deconfliction minima against all observed conflicting aircraft in Class G airspace. The applicable deconfliction minima is 5nm laterally and, with exceptions, 3000ft vertically. Concerns have been raised by the Airport Operator, the ANSP, CAA Flight Operations and the CAA Air Traffic Standards Department Operations Inspectorate regarding the safety risks associated with:

- a. IFR Operations in class G airspace in this area
- b. Airborne conflict outside of controlled airspace resulting in a reduction of the prescribed de-confliction minima
- c. Airspace congestion

50. In the absence of controlled airspace, these issues have been considered and incorporated into the CAA performance based oversight process, tabled at a meeting held between the CAA entity oversight manager, the Farnborough Airport Director and the NATS Farnborough General Manager at which the risks and control measures were discussed and the Sponsor's overarching safety plan reviewed. The risks are actively monitored as part of this performance based oversight activity. The current method of operation is supported by the inclusion of a number of preventative barriers designed to introduce, as far as is reasonably practicable, defined and agreed procedures and processes into a largely unknown air traffic environment. Whilst these measures have been effective to date, they are dependent on a number of limiting factors including; agreement rather than regulation, ATC workload/capacity, ATC intervention, ATC equipment and pilot interpretation of UKFIS in a particularly complex, unpredictable,

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*order to establish a safe, orderly and expeditious flow of traffic and to provide for the effective management of overall ATC workload.*

*Routeing instructions may be issued which will reduce or eliminate points of conflict with other flights, such as final approach tracks and circuit areas, with a consequent reduction in the workload associated with passing extensive traffic information. VRPs may be established to assist in the definition of frequently utilised routes and the avoidance of instrument approach and departure tracks.*

#### **<sup>7</sup> Cap 774 – UK Flight Information Services**

*ATS provision is constrained by the nature of the airspace environment in which the flight takes place. It is not mandatory for a pilot to be in receipt of an ATS in Class E/G airspace and this generates an unknown traffic environment in which controller/FISO workload cannot be predicted and where pilots may make sudden manoeuvres, even when in receipt of an ATS.*

unknown and thus challenging environment. In CAA's view, such factors and therefore risk will continue to scale in line with any sustained increase in IFR movements.

51. The failure of any particular barrier may increase the risk of; conflict between known IFR aircraft and unknown aircraft which may result in a reduction in the prescribed deconfliction minima, conflict between known Farnborough IFR aircraft and unknown aircraft during a critical phase of flight and ATC overload due traffic density/complexity.
52. A change in airspace category to class D (as set out in the modified ACP), would address the issues above by introducing a known air traffic environment for the critical departure phase of flight. A change in airspace category to Class E with an associated Transponder Mandatory Zone for CTAs 8 & 9 (as set out in the modified ACP) would enable safe integration of autonomous VFR flights in controlled airspace for suitably equipped aircraft without a clearance being required from air traffic control.
53. The introduction of controlled airspace CTR and CTAs, underlying and contiguous with the London Terminal Control Area (LTMA), to contain new RNAV instrument flight procedures would make this airspace a "known" environment i.e. air traffic controllers are aware of all aircraft in the volume of controlled airspace and will maintain IFR separation from all other aircraft. Pilots flying VFR and in accordance with the Rules of the Air are still responsible for maintaining separation from other VFR traffic but will be provided with traffic information on other traffic where practicable. This is an operational environment in which it is easier to maintain a high standard of safety having consideration to Farnborough's IFR operation.
54. General aviation airspace user stakeholders expressed a view at the CAA chaired Facilitation GA workshops that the introduction of controlled airspace in this environment would increase risk and reduce safety margins in this environment. Some of those present expressed the view that extending the CTR and introducing certain CTA areas will result in traffic squeeze. In their view, some GA pilot's reluctance to speak to ATC to access Class D airspace would lead to bottlenecks of traffic through

- remaining heavily congested Class G areas in which gliders and powered aircraft potentially occupying the same volume of airspace.
55. With respect to the airspace that would be classified as Class D (if the Sponsor implements what the CAA has approved), the CAA has concluded that any safety concerns can be mitigated by Farnborough ATC providing adequate resource to safely integrate VFR and IFR air traffic. CAP1535P (The Skyway Code) states that if you plan a route through controlled airspace, a crossing clearance may not always be possible and you should also have a contingency plan. The CAA recognises that the introduction of additional controlled airspace could result in 'pinch points' and bottlenecks but we have concluded that the build-up of bottlenecks can be reduced by all airspace users exhibiting appropriate airmanship including recognising the need to equip with a radio and to speak to air traffic control and can be managed by Farnborough ATC providing sufficient resource and fair and reasonable access arrangements.
56. With respect to the airspace that would be classified as Class E with an associated Transponder Mandatory Zone (in CTAs 8 and 9) (if the Sponsor implements what the CAA has approved) such classification will provide autonomous access to GA VFR transit aircraft (thereby reducing the need for any re-routing of suitably equipped aircraft and removing the need for any GA pilot with a transponder to speak to ATC to pass through the airspace) but will nevertheless address the issues identified above with the current airspace design and still result in a known environment and associated safety benefits.
57. CAA's Safety and Airspace Regulation Group's Instrument Flight Procedure (SARG IFP) regulators' analysis reached the view that all designs, in the final form proposed, were compliant with extant regulations.
58. We have therefore concluded that the proposal including the revisions known as Option 38 Class E with associated TMZ, the Modified ACP, would maintain a high standard of safety.

## Conclusions in respect of securing the most efficient use of airspace

59. The CAA is required to secure the most efficient use of the airspace consistent with the safe operation of aircraft and the expeditious flow of air traffic.<sup>8</sup>
60. The CAA considers that the most efficient use of airspace means the use of airspace that secures the greatest number of movements of aircraft through a specific volume of airspace over a period of time so that the best use is made of the limited resource of UK airspace. It is therefore concerned with the operation of the airspace system as a whole. We have concluded that the changes proposed, will enable more aircraft than is currently the case to use the airspace. In Class D airspace all users with a radio will be able to access the airspace provided that they obtain a clearance to do so. In Class E + TMZ airspace all users can access the airspace without clearance from air traffic control provided that they are transponding which means that air traffic controllers and other aircraft can see their presence on their equipment. Both these classifications of airspace create what is referred to as a known environment. Aircraft that flight plan are able to plan more efficient, and will be given more expeditious, routing by air traffic control when flying through known airspace and will be unlikely to be delayed on the ground before take-off as well as less likely to be re-routed mid-flight. We have considered the access arrangements open to all suitably equipped airspace users to accept. We note there was extensive simulator testing of the proposed designs which would have included working with heavy demand of Gatwick and Heathrow aircraft in this airspace and GA aircraft calling-up for clearance. We have concluded that overall more aircraft will be able to use the airspace and the changes proposed will lead to a more efficient use of that airspace. It may be possible to increase further the efficient use of this airspace if it were possible to agree access arrangements (LoAs) with some GA airspace users. However, this decision has been taken in the absence of such agreements at this time and based instead on the unilateral offer of access

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<sup>8</sup> Transport Act 2000, Section 70(2)(a).



arrangements set out in the Sponsor's letter to the CAA dated 4 September 2017.

61. The CAA considers the expeditious flow of air traffic to involve each aircraft taking the shortest amount of time for its flight. It is concerned with individual flights. We note that the planned routes will result in slightly longer routes for some aircraft than is currently the case. However, the CAA has concluded that on balance implementing this proposal will result in more expeditious routeings for aircraft arriving and departing Farnborough as they will be able to flight plan the new routes and procedures and are less likely to be re-routed on arrivals or shortly after departure in order to de-conflict, that is avoid, an unknown aircraft. We consider that the access arrangements open to all to accept mean that all airspace users will be able to access routeing as expeditious as is currently the case.
62. One element of this proposal is the introduction of RNAV-1 procedures. It is the CAA's view that the introduction of RNAV-1 procedures and technology is necessary in order to ensure the most efficient use of UK airspace possible in this area. This is reflected in more detail in the CAA's Future Airspace Strategy.<sup>9</sup> The CAA's Future Airspace Strategy reflects the UK's relevant international obligations in this area. These are set out in detail in [Annex D].

## **Conclusions in respect of taking into account the Secretary of State's guidance to the CAA on environmental objectives**

63. As set out in more detail in Annex C, the CAA has a duty to consider a number of material considerations when deciding whether or not to approve a change to the structure of UK airspace including the anticipated impact of the change proposed on the environment. We do so for two reasons:
64. Firstly, we needed to form an opinion on whether the change will have the significant environmental impacts identified in paragraph 9 of the 2001 Directions from the Secretary of State to the CAA in order to decide

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<sup>9</sup> <http://www.caa.co.uk/Commercial-industry/Airspace/Future-airspace-strategy/Future-airspace-strategy/>.

whether the Secretary of State's consent would be needed to promulgate the change should the CAA agree to the airspace change proposal, or whether the decision was solely a matter for the CAA<sup>10</sup>.

65. In the CAA's opinion the proposed change is not anticipated to have the significant environmental impacts identified in paragraph 9 of the 2001 Directions. This is because the overall exposure of any individual or community to noise on the ground is not anticipated to increase to a level that exceeds 57dB LA<sub>eq16 hour</sub>, where the increase in the level of exposure to noise in itself exceeds 3dB as a result of the proposed change. (The relevant CAA policy on this test is set out in paragraph C21 Annexe C). As set out in the CAA's Environmental Assessment this is because it is anticipated that the proposed changes to departure routes will have no impact upon the airport's L<sub>EQ</sub> noise contours.<sup>11</sup>
66. Secondly, we need to assess the anticipated environmental impact of the proposed change that we have been asked to decide on, in order to take it into account together with the other material considerations in our statutory duties, such as making the most efficient use of airspace, the requirements of operators and owners or the interests of others in relation to the use of airspace and so on.
67. With regard to this second reason for an environmental assessment, the CAA sets out its analysis of the environmental impact of the proposed change below (and in more detail in the Environmental Assessment Report). In summary, whilst noting that there is an anticipated environmental disbenefit of an increase in CO<sub>2</sub> emissions resulting from the introduction of the proposed RNAV routes which will result in longer tracks than is typically currently the case for aircraft vectored on a case by case basis by air traffic control, and that the introduction of the RNAV

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<sup>10</sup> Revised directions came into force on 1 January 2018. However, the CAA has received guidance from the Secretary of State that for proposals submitted to the CAA for decision before the revised directions came into force the test for whether the Secretary of State or CAA should make the decision is that set out in the previous directions which were dated 2001 (as amended in 2004). See paragraph 6.9 of Guidance to the CAA on its Environmental Objectives 2017 This proposal (as revised) was submitted to the CAA for decision in December 2016.

<sup>11</sup> Noise contours are used to represent on a map the location of places affected by different average noise levels.

routes result in greater concentration of aircraft flying those routes meaning some people will be overflown more frequently, we have concluded that that anticipated concentration of the aircraft flying those routes will result in less people being overflown by Farnborough traffic. This anticipated reduction in the number of people overflown is an important aspect of the guidance on our environmental objective given to us by the Secretary of State, meets the Sponsor's objective of reducing low overflight of populated areas and therefore we consider that that is a key anticipated environmental benefit of the proposed change.

68. The CAA has made the following assessment with respect to the anticipated environmental impact of the proposal:
69. With regard to CO<sub>2</sub> and based on the actual number of aircraft movements in 2016, the anticipated increase in number of aircraft movements would generate an increase of 1,700 tonnes of CO<sub>2</sub> per year, which is comparatively small.
70. With regard to Local Air Quality the airport is neither in or adjacent to an Air Quality Management Area and therefore air quality in the vicinity of the proposed airspace change is unlikely to be noticeably affected and limits are therefore unlikely to be breached.
71. With regard to AONBs and National Parks the impact will be no worse than currently experienced, with the potential to improve if aircraft achieve improved vertical profiles.
72. The CAA has assessed the anticipated impact of aircraft noise that results from the changes proposed and in so doing had regard to the altitude-based priorities as given to the CAA by the Secretary of State in the 2014 Air Navigation Guidance to CAA on Environmental Objectives and also the guidance in respect of the environmental impact of new technology of the type that is the subject of this proposal as follows:

*“With PBN, the overall level of aircraft track-keeping is greatly improved for both approach and departure tracks, meaning aircraft will be more concentrated around the published route. This will mean noise impacts are*

*concentrated on a smaller area, thereby exposing fewer people to noise than occurs with equivalent conventional procedures.*

*...Concentration as a result of PBN is likely to minimise the number of people overflown, but is also likely to increase the noise impact for those directly beneath the track as they will be overflown with greater frequency than if the aircraft were more dispersed.*

*...The move to PBN will require the updating of existing route structures such as Standard Instrument Departures (SIDs), Standard Terminal Arrival Routes (STARs) and Initial Approach Procedures (IAPs). Updating individual routes in terminal areas can fall into one of two categories: “replication” where the existing route alignment is preserved as much as possible whilst catering for the greater navigational accuracy of PBN, or “redesign” where seeking to optimise the introduction of PBN will require consideration of a different alignment.”*

73. There are no new people that will be significantly affected by noise as a result of this proposal. However, that does not mean that there will not be some people that experience an increase in noise – as the proposal itself notes, the result of introducing PBN procedures is very likely to result in some areas being overflown with greater consistency and regularity whilst other areas will be overflown less. Any areas overflown more often are likely to result in some people experiencing an increase in aircraft noise, but not at levels that would be considered “significant”.
74. A large reduction in population overflown is expected (an approximate reduction of 505,000 people) in terms of departing aircraft. This is consistent with the greater accuracy with which RNAV SIDs are flown. It is also worth noting that the contrary impact is that a smaller number of people can expect to be overflown more often below 7,000ft (approximately 37,000 people).
75. In terms of the change in impact resulting from arriving aircraft, a smaller scale reduction in population overflown is expected (an approximate reduction of 256,000 people). This is consistent with the expected nature of arriving aircraft; these will continue to be tactically vectored by ATC (that is given individual routings by ATC on the day as appropriate to the

circumstances at the time) and therefore not display the concentrated pattern typical of RNAV departures, but still with an element of narrower dispersion as a result of the STARs. It is also worth noting that the contrary impact is that a number of people can expect to be overflown more often below 7,000ft (approximately 813,000 people).

76. In line with the Air Navigation Guidance 2014, the CAA has considered the potential for 'respite' options<sup>12</sup>. Consideration of multiple routes as a means of incorporating respite was not a feasible option for the Sponsor. The location of the airport in relation to other airports (i.e. Heathrow, RAF Odiham, Blackbushe, Fair Oaks, Lasham and Gatwick) meant that a design that incorporated multiple routes (as proposed to a design that sought to minimise routes and thereby minimise the number of people overflown) was not possible due to airspace limitations.
77. The Runway 06 SID "has been designed to avoid direct over-flight of Guildford, Aldershot and Farnham". Whilst it is correct that the SID avoids direct overflight of these towns, it is noted that it still remains close to the southern limit of Farnham such that residents in that vicinity may perceive that they are overflown. Aircraft are expected to be at 5,000ft at this point.
78. Smaller centres of population such as Pirbright, Wood Street Village, Puttenham and Rowledge remain close to the Runway 06 SID track and so it is reasonable to expect that residents in these locations are likely to perceive that they are being overflown.
79. After the first turn, the vertical profile of aircraft using the Runway 06 SID is expected to improve in comparison to current departures meaning that they will typically be higher than current departing aircraft.
80. The Runway 06 SID crosses the Surrey Hills AONB. Current departures already cross this AONB, but the vertical profile of aircraft using the

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<sup>12</sup> Respite is planned and predictable alleviation from aircraft noise. One example of respite is having SIDs taking different routes to the same UK exit point which are used at different times. Respite can be designed into airspace structures more easily once aircraft tracks are predictably concentrated on to safely separated routings, enabling the use of them to be alternated or varied. There is currently no agreed minimum distance between routes such that alternating their use would result in acceptable respite.

- Runway 06 SID means that it is expected that aircraft will be higher than current departures as the cross this location.
81. As traffic achieves 5,000ft, the Runway 06 SID has been designed to avoid direct overflight of the major centres of population such as Alton, Bordon, Liphook, Four Marks, Ropley and New Alresford area below 7,000ft.
  82. The Runway 06 SID passes directly over Upper Farringdon but at that location about 85% of all departures are expected to at or above 7000ft.
  83. As the Runway 06 SID reaches the South Downs National Park, aircraft should be about 1,600ft higher than current departures would achieve due to the removal of airspace restrictions. It remains within the National Park boundary for about 9km before exiting at West Worldham, where aircraft should be at or above 6,000ft.
  84. 15% of aircraft are estimated to be between 5,000ft-6,000ft at Upper Farringdon. These aircraft are expected to remain on the Runway 06 SID as it continues south, passing over or close to East Tisted, High Cross, Foxfield Green, Ramsdean and Langrish. By Langrish/Ramsdean, these aircraft are expected to be at 7,000ft or above. Residents in these locations may perceive that they are overflown by these aircraft.
  85. The Runway 24 SID “has been designed to avoid direct over-flight of Church Crookham, Fleet, Ewshot, Crondall, Farnham and Alton”. Whilst it is correct that the SID avoids direct overflight of these locations, it is noted that it still remains close to Fleet (the southern limit of the town), Ewshot, Crondall and Bentley such that residents in those locations may perceive that they are overflown.
  86. A new first turn immediately after take-off takes the track of the Runway 24 SID over the MoD training grounds, avoiding the population centres of Fleet and Church Crookham that are currently overflown.
  87. After passing Ewshot the vertical profile of aircraft using the Runway 24 SID is expected to improve in comparison to current departures meaning that they will typically be higher than current departing aircraft.

88. As traffic achieves 5,000ft, the Runway 24 SID has been designed to avoid direct overflight of the major centres of population such as Alton, Bordon, Liphook, Four Marks, Ropley and New Alresford area below 7,000ft.
89. The Runway 24 SID passes directly over Upper Farringdon but at that location about 85% of all departures are expected to at or above 7,000ft.
90. As the Runway 24 SID reaches the South Downs National Park, aircraft should be about 1,600ft higher than current departures would achieve due to the removal of current airspace restrictions. It remains within the National Park for about 7km before exiting at West Worldham, where aircraft should be at or above 6,000ft.
91. 15% of aircraft are estimated to be between 5000ft-6000ft at Upper Farringdon. These aircraft are expected to remain on the Runway 24 SID as it continues south, passing over or close to East Tisted, High Cross, Foxfield Green, Ramsdean and Langrish. By Langrish/Ramsdean, these aircraft are expected to be at 7,000ft or above. Residents in these locations may perceive that they are overflown by these aircraft.
92. Unlike the departing aircraft, arriving aircraft will, more often than not, be taken off the pre-programmed arrival route and tactically vectored by ATC. Tactical vectoring by air traffic controllers results in variation of aircraft tracks and because of this, the sponsor has portrayed the arrival routes as swathes rather than a single track.
93. Even though tactical vectoring of arriving aircraft occurs currently, the tracks flown by arrivals using the proposed procedures would be more consistent and predictable than the current system. Their expected typical spread of tracks would be narrower than today. Within the anticipated swathe, there may still be areas of concentration, i.e. there is unlikely to be an even dispersion of arriving aircraft across the swathe.
94. It is expected that arriving aircraft will typically be between 600ft and 1,000ft higher than the current equivalent traffic, during the descent from 7000ft t.
95. Arriving aircraft will typically descend over the South Downs National Park within the narrower swathe down to 4,000ft at its northern boundary.

Currently this park is over-flown widely, and typically at lower altitudes than are expected if the proposal is implemented.

96. The South Downs National Park and Surrey Hills Area of Outstanding Natural Beauty would continue to be overflown by arriving aircraft though generally in a narrower swathe, and at altitudes similar to or higher than today.
97. From an altitude of 5,000ft, arriving aircraft from the north for Runway 06 are expected to head south-east over Hook and Fleet, to cross the airport (or the final approach track) at 3,000ft-4,000ft, and continue their arrival from the south side of the A31. They will no longer descend to the final approach track directly from the north in the vicinity of Crookham Village below 2,000ft, a manoeuvre they sometimes currently perform. Once south of the airport they will then turn right to join a typical landing pattern similar to today, re-crossing the A31 in the vicinity of Upper and Lower Froyle. They will turn onto final approach near Long Sutton or Well, as the arriving aircraft from the south do currently (and at similar altitudes).
98. The South Downs National Park and Surrey Hills Area of Outstanding Natural Beauty would continue to be overflown by arriving aircraft though generally in a narrower swathe, and at altitudes similar to or higher than today.
99. Arriving traffic from the south is expected to move westward, taking the main flow of arrivals more directly over locations such as Midhurst and Easbourne.
100. The pattern of traffic over the South Downs National Park will also change. Whilst this will be at altitudes below 7,000ft, the change represents a re-distribution of aircraft rather than a change in altitudes or numbers of aircraft.

### **Conclusions in respect of environmental impact**

101. For the reasons set out and summarised above, the CAA acknowledges the anticipated environmental impact of the proposed change and has taken this into account when weighing the factors that the CAA is required



by statute to consider when making its decision whether to agree to the change proposed.

## Conclusions in respect of aircraft operators and owners

102. The CAA has a duty to satisfy the requirements of operators and owners of all classes of aircraft.<sup>13</sup>
103. The introduction of Class D or Class E+TMZ CAS will have an impact on non IFR airspace users. The proposed new airspace structures will be contiguous with the overlying LTMA, that is the proposed new airspace is a slice of airspace that sits immediately below airspace above it which is already controlled, Class A, airspace, and will bring controlled airspace down to 4500ft in the CTAs, with Class G airspace remaining below. As has already been identified in this decision it is considered by some GA operators that the introduction of controlled airspace will cause 'bottlenecks' in the remaining Class G and be detrimental to safety of operations in remaining Class G airspace. The CAA has addressed the safety analysis elsewhere in this decision. In summary for the reasons set out below the CAA has concluded that the classification of the airspace proposed, combined as applicable with associated transponder mandatory zones, provides fair and proportionate access to all airspace users and all classes of aircraft to the proposed new CAS, for the following reasons:
104. It has been made clear by some stakeholders to the CAA at the CAA Chaired Facilitation meetings in 2016 (and in letters and e-mails the CAA has received) that they do not consider the new controlled airspace proposed is necessary or a proportionate response to issues with the existing airspace design (having consideration to their own needs and preferences as airspace users).
105. At the same time IFR operators have provided feedback that they support the introduction of controlled airspace in order to realise the safety benefits of a known environment for their operations. Flying in a known environment reduces pilot workload due to the requirements to look around

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<sup>13</sup> Transport Act 2000, Section 70(2)(b).

whilst flying in Glass G airspace and increased need to speak to air traffic control for example for re-routeing. The introduction of RNAV SIDS and STARS, together with a known environment will enable operators and pilots to flight plan more effectively (which reduce the amount of fuel needs to be loaded before take-off) and repeat flight-planning will be available. Additionally, IFR operators support the implementation of the airspace design proposed in order to reduce the delays experience by the need of ATC to maintain separation minima in the current airspace design.

106. The amount of controlled airspace proposed by Farnborough has reduced between the design first set out in the initial consultation and the proposal that the CAA is considering in this decision (Option 38). The original ACP (Option 25) was modified (Option 34) and the revised airspace structure was reduced in volume by 32% and sought to reduce the impact on general aviation activities.
107. A further redesign of the airspace was required (Option 38) to procedurally deconflict from a Gatwick departure procedure. The revised airspace design was in the Sponsor's view the minimum controlled airspace required to satisfactorily contain the new instrument flight procedures in an RNAV1 environment. Option 38 further reduced the volume of CAS by removing CTA9 and CTA10, redesignating CTA11 as CTA9, but enlarging CTA7 to accommodate the revised VEXUB STARs from the south. An air traffic control clearance is required to operate in Class D CAS and minimum aircraft equipment conditions apply. We also note and take into account that pilots will also need to obtain an RT licence to access new Class D airspace, and Class E+TMZ airspace if not equipped with a serviceable transponder, and that some current airspace users in the GA community will not have one. Although it is the case that it is the responsibility of the Sponsor to manage the proposed airspace design (if it is implemented) to ensure that reasonable access is provided to all aircraft that can comply with the conditions of entry, it acknowledged that some users currently accessing the airspace proposed to be Class D cannot currently comply with the equipment requirements (see below) and all aircraft will have to obtain clearance to enter the airspace.

108. Farnborough has agreed 8 draft LoA which will come into effect when this change is implemented. It has not been possible for the Sponsor to agree Letters of Agreement with Lasham Gliding Society and Southdown Gliding Club, setting out agreed airspace access arrangements. The CAA acknowledges the Sponsor's attempts to do so, and in particular the Sponsor's agreement to attend meetings facilitated by the CAA to discuss this issue with the relevant stakeholders. In the absence of agreement, the CAA therefore required the Sponsor to set out a unilateral offer of airspace access arrangements<sup>14</sup> and the CAA's decision has been taken on the basis that these access arrangements are open to all with suitably equipped aircraft to accept.<sup>15</sup>
109. In Class E+TMZ airspace, all VFR operations with a serviceable and operative Transponder can access the airspace without having to contact the controlling authority, Farnborough ATC
110. The CAA's assessment of the impact of the introduction of the proposed classified airspace has taken into account the work that is on-going with respect to low cost electronic conspicuity equipment. This work is summarised in Annex H (ADS-B in a General Aviation Context). However, in summary, it is anticipated that in the short-medium term all aircraft will be able to transpond with ADS-B which is low cost safe and satisfactory transceiver based system and will thereby satisfy the criteria for autonomous VFR operations when crossing Class E+ TMZ.
111. In summary the CAA acknowledges the positive and negative benefits for the different airspace users that want to utilise this airspace, the efforts that have been made to reduce the negative benefits and the current work on-going with respect to transponders which affect its assessment of them, all set out above. The CAA has taken all of this into account when making its decision. The CAA has concluded that the Modified ACP satisfactorily addresses the requirements of all operators and owners known to require access to this airspace having regard to the variety of those users' needs

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<sup>14</sup> See letter to CAA dated 4 September 2017

<sup>15</sup> The CAA also notes that Letter of Agreement may yet still increase access for some users if these can be agreed after this decision is made or implemented.

and aircraft types. In particular the CAA has concluded that the Modified ACP represents a better outcome in this regard than the ACP.

### **Conclusions in respect of the interests of any other person**

112. The CAA considers the words “any person (other than an operator or owner of an aircraft)” to include airport operators, air navigation service providers, members of the public on the ground, owners of cargo being transported by air, and anyone else potentially affected by an airspace change proposal.
113. The CAA is required to take account of the interests of any person (other than an owner or operator of an aircraft) in relation to the use of any particular airspace or the use of airspace generally. The CAA examined a number of anticipated impacts, some of which attracted feedback during the consultation process outlined above.
114. This decision document deals above with consideration of the anticipated environmental impact on the public on the ground in the paragraphs relating to the environmental impact of the proposed change below.
115. The proposed airspace design change will benefit Farnborough airport as it will enable Farnborough to increase its IFR operations to meet the anticipated demand and make more efficient use of the surrounding airspace.
116. The benefit to Farnborough ATC is evident in that it will be providing an air traffic control service only within a known air traffic environment, within CAS. The benefit to NATS (NERL) Terminal Control is that all IFR air traffic routing in and out of Farnborough will be either handed over or received wholly within CAS. All itinerant unknown air traffic will cease to be considered as the airspace will be a known and safer air traffic environment. The new airspace structures will secure the most efficient use of airspace consistent with the safe operation of aircraft and the expeditious flow of IFR air traffic. NATS have participated in the development of this proposal by providing input to the CAA’s safety assessment team considering it. See below.

## Integrated operation of ATS

117. The CAA is required to facilitate the integrated operation of air traffic services provided by or on behalf of the armed forces of the Crown and other air traffic services.<sup>16</sup>
118. In this respect, this airspace change proposal has been coordinated with NATS (NERL), the UK en-route air navigation service provider (ANSP). NERL has been part of the development process and has managed and participated in development and validation simulations with Farnborough ATC. The impact on the NATS Terminal Control (TC) Sectors in the south of England is significant and following approval of these changes, a period of controller training will be required to finalise the new ATC arrangements. Other pre-implementation conditions relevant to the ATC operation apply to a change to airspace design made in respect of this decision and are set out in Annex A.

## Interests of national security

119. The CAA is required to take into account the impact any airspace change may have upon matters of national security.<sup>17</sup> There are no impacts for national security.

## International obligations

120. The CAA is required to take into account any international obligations entered into by the UK and notified by the Secretary of State.<sup>18</sup> The UK's international obligations that relate to the introduction of RNAV-1 or performance-based navigation are set out in Annex D. With regard to replication procedures, all foreign operators will be able to fly the new procedures providing the crews and aircraft are certified and approved to fly RNAV-1 procedures in accordance with their own States' national regulations.

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<sup>16</sup> Transport Act 2000, Section 70(2)(e).

<sup>17</sup> Transport Act 2000, Section 70(2)(f).

<sup>18</sup> Transport Act 2000, Section 70(2)(g).

## Chapter 3

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## CAA's Regulatory Decision

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121. Noting the anticipated impacts on the material factors we are bound to take into account described in Chapter 2 and the undertakings given by Farnborough set out in Annex A the CAA has decided to approve the introduction of controlled airspace (CAS) in the vicinity of Farnborough airport, composing of a Class D CTR, Class D CTAs and Class E+TMZ CTAs and the extension to the LTMA11 to contain the RNAV1 VEXUB STAR from the northwest set out in the modified ACP.
122. The CAA's primary statutory duty is safety and it is considered that maintaining the existing arrangements of operating increased numbers of IFR movements in a complex area of Class G uncontrolled airspace places too much risk on airspace users and air navigation service providers (ANSP). The CAA has considered that the new CAS is therefore required to safely and expeditiously manage new RNAV instrument flight procedures which will remove the significant detouring that currently occurs, and safely accommodate any future growth in operations at Farnborough or other airspace users using the same airspace.
123. The CAA has concluded that that the Modified ACP, combined with the access arrangements open to all with suitably equipped aircraft to accept, represents the most equitable means of satisfying the requirements of the operators and owners of all classes of aircraft whilst at the same time achieving the important benefits of the proposal.
124. The CAA has concluded that the alternatives proposed by GA stakeholders were unfeasible due to the effect on Gatwick and Heathrow and that that design proposed was so different to that being considered by the CAA in this proposal that it could not be dealt with by way of a modification but would need to be proposed as an alternative proposal developed in accordance with the CAA's airspace change process.

125. As set out above the CAA acknowledges the adverse environmental noise impact on some local communities resulting from the concentration of aircraft tracks that we anticipate will result from the introduction of RNAV1 technology. However, taking into account our primary duty to maintain a high level of safety and our own policy and the UK obligation to introduce PBN technology and acknowledging and accepting that the overall environmental noise impact is minimised so far as possible by the SID and STAR designs proposed, the CAA has decided to approve the change requested.
126. The CAA has made this decision on the basis that Farnborough has offered access arrangements open to all with suitably equipped aircraft to accept which in our view offer an opportunity for all airspace users to have reasonable access to the new CAS without the need to operate a serviceable transponder but with a clearance established through radio telephony (R/T) with Farnborough ATC.
127. To enable the requisite NATS TC Sector training together with the Farnborough ATC controllers, it is anticipated that the changes will not be implemented before Winter 2019/20.

Civil Aviation Authority

10 July 2018

## Annex A

# Undertakings

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## Undertakings given by Farnborough

1. When electronic conspicuity devices (for example ADS-B) have advanced to a state of development that they are considered acceptable and interoperable by meeting EASA safety requirements, Farnborough undertake to implement the surveillance of such devices as another standard means for VFR traffic to gain access to Class E + conspicuity airspace
2. During the lengthy discussion about this airspace Farnborough have produced draft LoAs which if implemented, would allow special access rights for Lasham and SouthDown gliding clubs. Farnborough undertake to make these or new agreed (and improved) LoAs available in the future when these gliding clubs are minded to request them
3. Farnborough will demonstrate continued collaboration with Lasham Gliding Society and Southdown Gliding Club to agree reasonable access arrangements to CTA's 2, 3, 6, 8, and 9.
4. Noting that all flights operating in the new Class E+TMZ airspace shall carry and operate Secondary Surveillance Radar (SSR) transponders capable of operating on Modes A and C or on Mode S, unless in compliance with alternative provisions prescribed for that particular airspace by Farnborough ATC, Farnborough will consider whether specific access arrangements can be agreed for pilots who meet radio carriage and operation requirements, wishing to operate in the new Class E+TMZ airspace without serviceable transponder equipment.



Annex B

# Diagrams relating to change

Figure 1 - Option 25

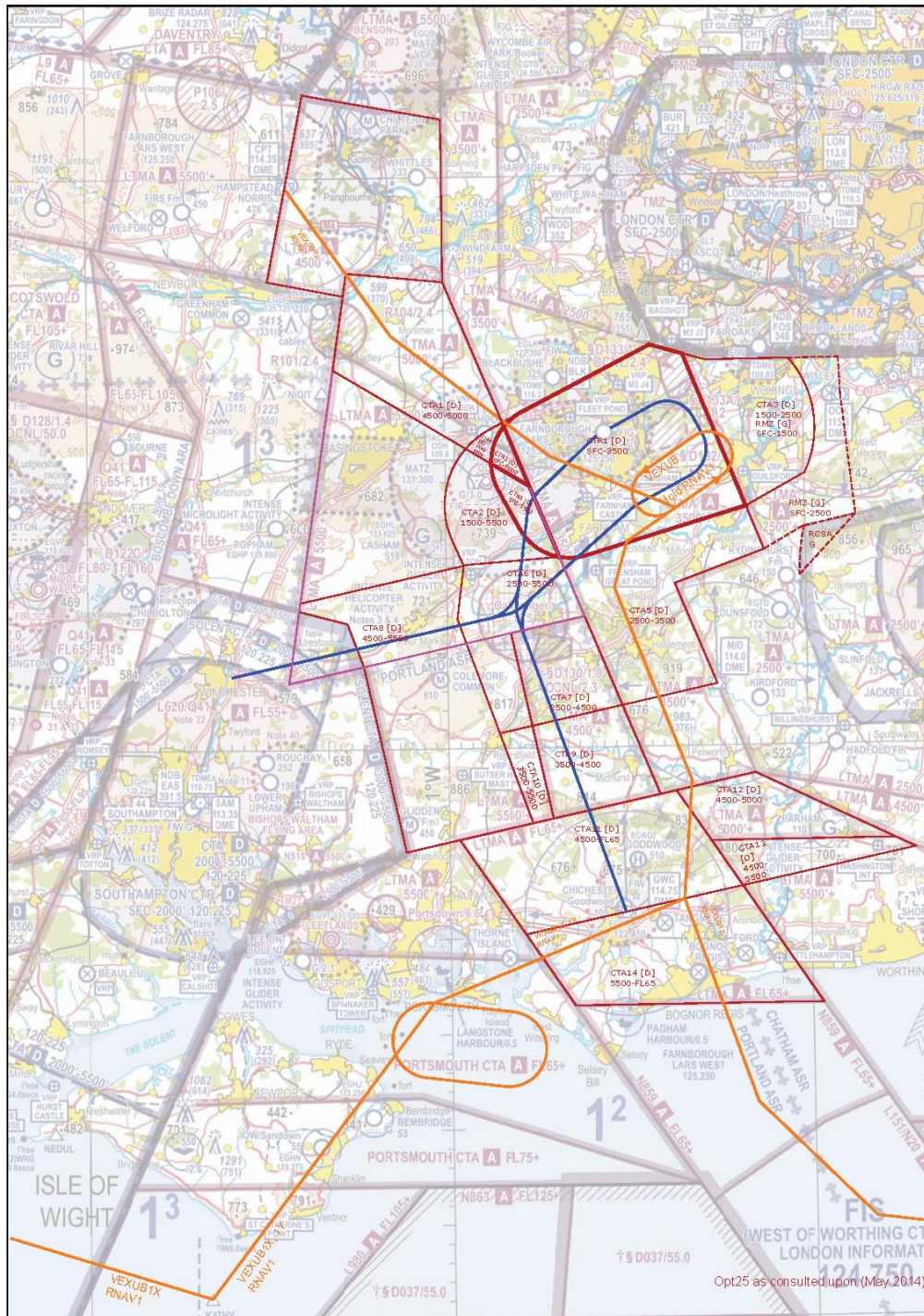


Figure 2 - Option 34 submitted as proposal to CAA July 2015

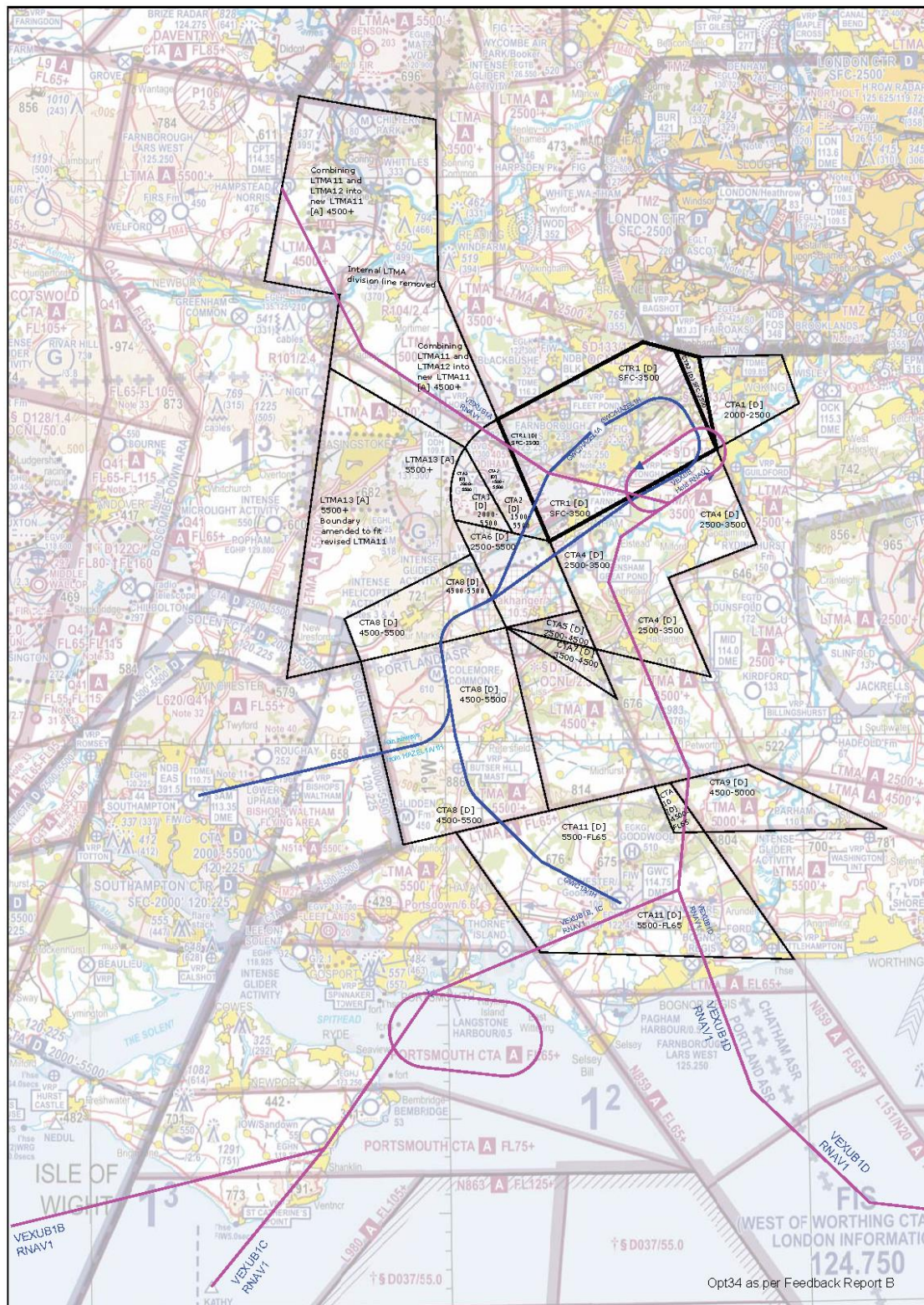
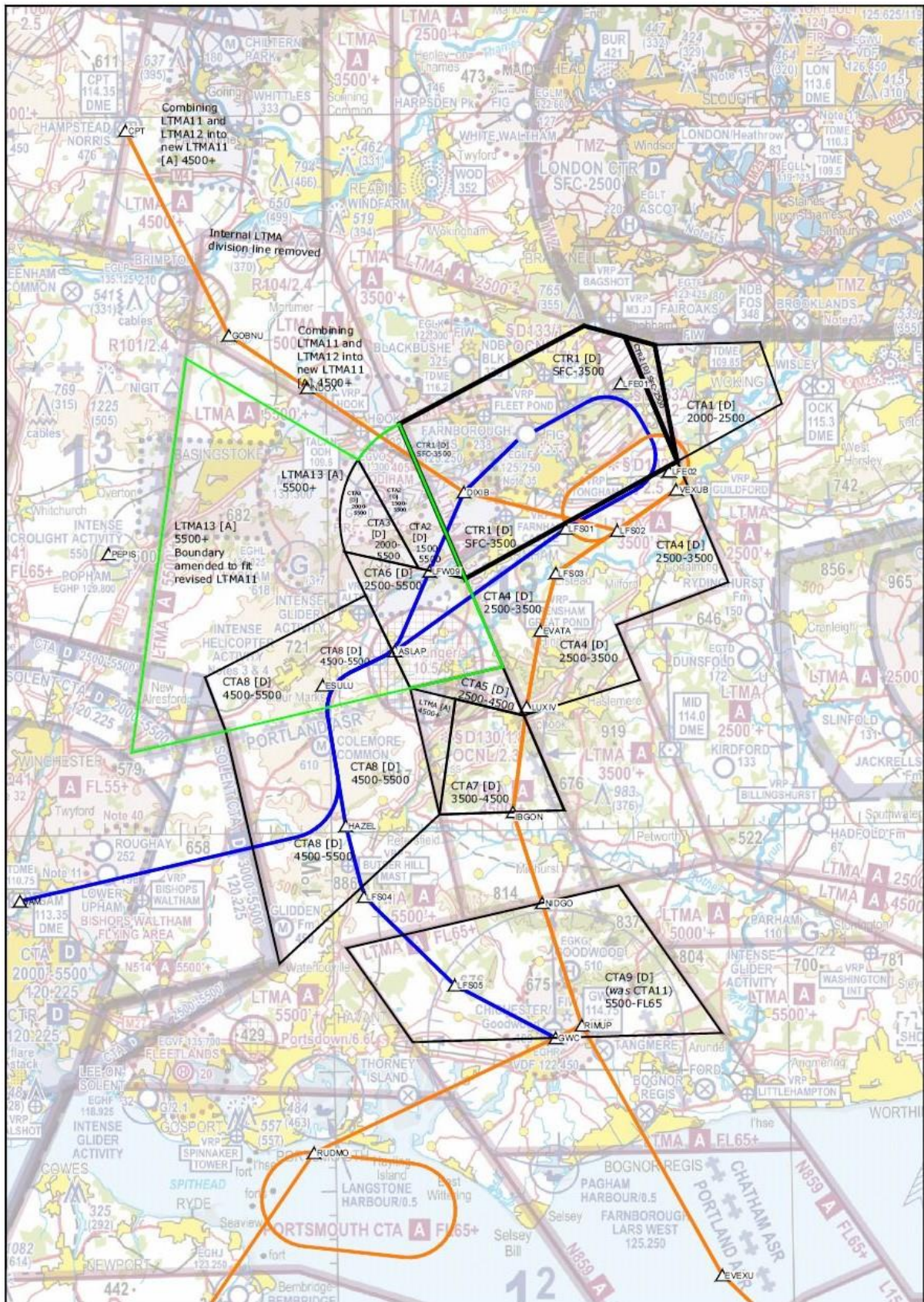


Figure 3 - Option 38 revisions to July 2015 proposals submitted December 2016



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## Description of revisions between Figure 3 (above) and Figure 4 (below)

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### Option 38, all CTRs and CTAs are Class D airspace (figure 3)

Class D airspace:

- VFR and IFR flying is permitted.
- An ATC clearance is needed to enter (unless under other arrangements, via an LoA for example) and compliance with ATC instructions is mandatory.
- Air traffic controllers will separate IFR traffic from other IFR traffic and Special VFR (SVFR) traffic and provide traffic information to pilots flying IFR about VFR traffic.
- Air traffic controllers will separate SVFR traffic from other IFR traffic and Special VFR (SVFR) traffic and provide traffic information to pilots flying IFR about VFR traffic.
- Pilots flying VFR have a responsibility to separate themselves from other traffic. Air traffic controllers will pass traffic information to VFR pilots about other VFR traffic and IFR traffic.
- Radio carriage and operation is required in Class D airspace (unless under other arrangements, via an LoA for example).

### Option 38 + CTAs 8 and 9 Class E + TMZ (figure 4)

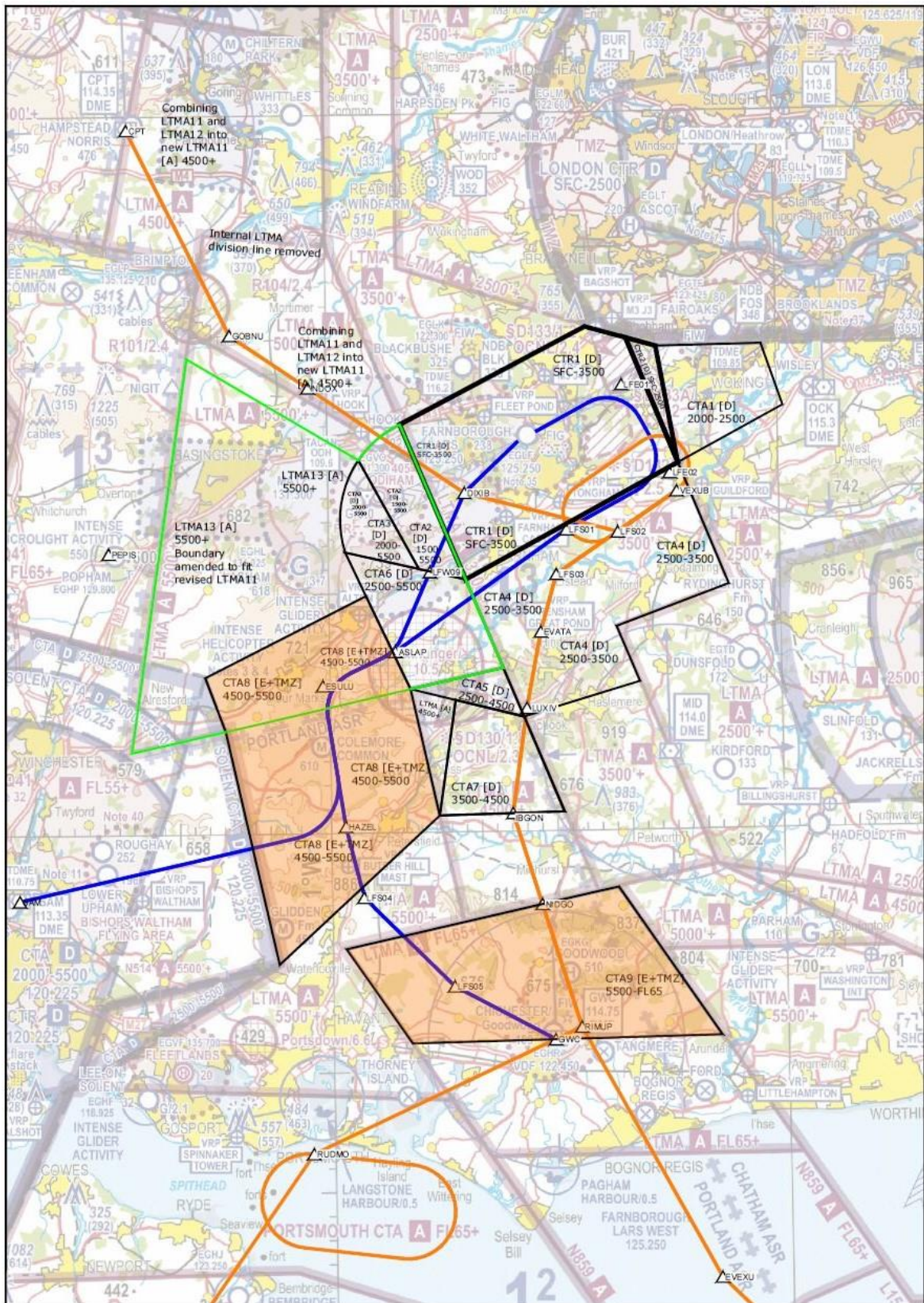
Class D rules apply in all CAS other than CTAs 8 and 9

Class E + TMZ airspace (CTAs 8 and 9)

- VFR and IFR flying is permitted.
- An ATC clearance is needed to enter and compliance with ATC instructions is mandatory **for IFR traffic only**.
- Air traffic controllers will **separate IFR traffic from other IFR traffic only** and provide traffic information to pilots flying IFR or VFR **as far as practicable**.
- Pilots flying VFR have a responsibility to separate themselves from other traffic.

- **Transponder carriage and operation is required for all traffic (unless under other arrangements such as an agreement on radio comms)**
- **Aircraft not equipped with either radio or transponder will only be given access to this airspace subject to an agreement with the controlling authority (e.g. LoA)**
- **Radio carriage and operation is not required for VFR traffic unless under other TMZ access arrangements that require radio comms, or unless choosing to participate in ATS**

Figure 4 - Option 38 with Class E + TMZ Farnborough proposals with revisions for the purpose of the draft decision



## Annex C

## The CAA's role in airspace change decisions, the legal framework, the policy background and relevant UK international obligations

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C1. The Secretary of State has given the CAA functions that relate to airspace. The current Directions are dated 2017 and came into force on 1 January 2018. Pursuant to these directions the CAA must “prepare and maintain a co-ordinated strategy and plan for the use of UK airspace...” (Direction 3(e)). Additionally pursuant to Direction 5,

**“Proposed permanent change to airspace design**

5—(1) Subject to direction 6, in accordance with its published strategy, procedures and policy on the design and classification of UK airspace, the CAA must decide whether to approve a proposal for a permanent change to airspace design.

(2) The CAA may make its approval of a proposal subject to such modifications and conditions as the CAA considers appropriate. “

C2. The previous version of the Directions is dated 2001 (amended in 2004).<sup>19</sup> These Directions required the CAA to develop and enforce a policy for the sustainable use of UK airspace. By virtue of this function the CAA developed its Future Airspace Strategy (known as FAS)<sup>20</sup> which is an initiative started by the CAA to create a joined-up UK airspace and air traffic management (ATM) modernisation programme across the many different stakeholder groups involved. The goal of FAS is to modernise the UK airspace and ATM infrastructure through significant technological improvements by 2030, to make a more efficient use of airspace (thereby providing airspace capacity benefits), as well as secure environmental (noise and emissions) and safety benefits.

C3. We believe the requirements of the strategy and plan required by Direction 2017 3(e) cannot be fully met by the current Future Airspace Strategy (FAS).

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<sup>19</sup> The Civil Aviation Authority (Air Navigation) Directions 2001 (incorporating Variation Direction 2004).

<sup>20</sup> <http://www.caa.co.uk/Commercial-Industry/Airspace/Future-airspace-strategy/Future-airspace-strategy>.

Therefore, we are currently drafting a new Airspace Modernisation Strategy. We will publish a draft in summer 2018 to allow us to take the needs and views of affected parties into account. .

- C4. Much of the UK and European law that underpins the strategy remains the same, so many of the technical aspects of FAS will be incorporated into the new strategy. But while parts of FAS remain relevant, the strategy needs to be rearticulated in the context of potential government policy changes (e.g. Airports National Policy Statement) and technological developments (e.g. drones, commercial spaceflight)
- C5. We will publish the final Airspace Modernisation Strategy at the end of 2018. In the meantime FAS remains the strategy referred to in Direction 2017 5(1) above.
- C6. One means by which the CAA delivers the aims of FAS is via its statutory air navigation function to consider proposals from air navigation service providers and/or airports to change the structure of UK airspace (including the published instrument flight procedures) published in the UK's Aeronautical Information Publication (AIP).
- C7. By Section 70 of the Transport Act 2000 (the Transport Act), the CAA is under a general duty in relation to air navigation to exercise its functions so as to maintain a high standard of safety in the provision of air traffic services. That duty is to have priority over the CAA's other duties in this area of work.
- C8. Noting that priority, the CAA's duties in relation to air navigation is to exercise its functions in the manner it thinks best so that:
- It secures the most efficient use of airspace consistent with the safe operation of aircraft and the expeditious flow of air traffic.
  - It satisfies the requirements of operators and owners of all classes of aircraft.
  - It takes account of the interests of any person (other than an operator or owner) in relation to the use of any particular airspace or airspace generally.



- It takes account of any guidance on environmental objectives given to the CAA by the Secretary of State.
- It facilitates the integrated operation of air traffic services provided by or on behalf of the armed forces and other air traffic services.
- It takes account of the interests of national security.
- It takes account of any international obligations of the UK notified to the CAA by the Secretary of State.

C9. Where an airspace change proposal does not conflict with any of the sub-paragraphs of Section 70(2), the CAA will, subject to exceptional circumstances, approve the airspace change proposal.

C10. Where an airspace change proposal satisfies some of the sub-paragraphs in Section 70(2) but not others, this is referred to as a conflict within the meaning of Section 70(3).

C11. In the event of a conflict, the CAA will apply the matters set out in Section 70(2) in the manner it thinks is reasonable having regard to them as a whole, in accordance with Section 70(3) .

C12. The CAA must exercise its functions in this area so as to impose on providers of air traffic services the minimum restrictions consistent with the exercise of those functions.

C13. The CAA will approve an airspace change proposal that best satisfies all of the material considerations (where safety is not in issue), or all the material considerations that are engaged. Where a change would satisfy some of the material considerations, but would be contrary to the fulfilment of others, then there is a conflict within the meaning of Section 70 of the Transport Act. In reaching a decision in such circumstances, the CAA will apply its expertise to all the relevant information before it and use its judgement to strike a fair balance between the material considerations.

C14. In striking that balance the CAA relies on the wording of Section 70 which indicates the relative importance of any given factor.

C15. In the instance of conflict, the CAA will usually offer suggestions to the sponsor of a proposal as to how the conflict might be mitigated or resolved, including encouraging the sponsor to engage with affected stakeholders in determining how the desired outcome might be achieved.

C16. The CAA considers the most efficient use of airspace to be that use of airspace that secures the greatest number of movements of aircraft through a specific volume of airspace over a period of time so that the best use is made of the limited resource of UK airspace. It is therefore concerned with the operation of the airspace system as a whole.

C17. The CAA considers the expeditious flow of air traffic to involve each aircraft taking the shortest amount of time for its flight. It is concerned with individual flights.

C18. The CAA considers the words “any person (other than an operator or owner of an aircraft)” to include airport operators, air navigation service providers, members of the public on the ground, owners of cargo being transported by air, and anyone else potentially affected by an airspace proposal.

C19. The Secretary of State has given the CAA specific guidance on environmental objectives within the meaning of Section 70 of the Transport Act.<sup>21</sup> The current version is dated October 2017. However, the Secretary of State has guided the CAA that the CAA should use the previous version of the guidance for those proposals that were consulted on before the 1 January 2018. Accordingly the CAA has used the previous version of the Secretary of State's guidance to the CAA on its environmental objectives, the 2014 guidance.

C20. The 2014 Guidance includes the following:

*The CAA's primary objective is to develop a “safe, efficient airspace that has the capacity to meet reasonable demand, balances the needs of all users and mitigates the impact of aviation on the environment”.*

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<sup>21</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/269527/air-navigation-guidance.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/269527/air-navigation-guidance.pdf).

*In December 2012, the industry-led FAS Industry Implementation Group launched its plan for delivering Phase 1 of the FAS up to c2025. A considerable component of the plan is the need to redesign UK's terminal airspace to make it more efficient by using new procedures such as Performance-Based Navigation (PBN)<sup>22</sup> and better queue management techniques.*

C21. The 2014 Guidance states the need to balance environmental factors against other factors:

*The purpose of the Guidance is to provide the CAA and the aviation community with additional clarity on the Government's environmental objectives relating to air navigation in the UK. However, when considering airspace changes, there may be other legitimate operational objectives, such as the overriding need to maintain an acceptable level of air safety, the desire for sustainable development, or to enhance the overall efficiency of the UK airspace network, which need to be considered alongside these environmental objectives. We look to the CAA to determine the most appropriate balance between these competing characteristics.*

C22. The need to strike a balance specifically in relation to noise is stated as follows:

*The Government has made it clear therefore that it wants to strike a fair balance between the negative impacts of noise and the economic benefits derived from the aviation industry.*

C23. The 2014 Guidance also states the Government's overall policy to limit the number of people significantly affected by aircraft noise.

C24. The 2014 Guidance states that the CAA should keep in mind the following altitude-based priorities:

- In the airspace from the ground to 4000ft AMSL the Government's environmental priority is to minimise the noise impact of aircraft and the number of people on the ground significantly affected by it;

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<sup>22</sup> Of which RNAV-1 is a type.

- where options for route design below 4000ft AMSL are similar in terms of impact on densely populated areas the value of maintaining legacy arrangements should be taken into consideration;
- in the airspace from 4000ft AMSL to 7000ft AMSL, the focus should continue to be minimising the impact of aviation noise on densely populated areas, but the CAA may also balance this requirement by taking into account the need for an efficient and expeditious flow of traffic that minimises emissions;
- in the airspace above 7000ft AMSL, the CAA should promote the most efficient use of airspace with a view to minimising aircraft emissions and mitigating the impact of noise is no longer a priority;
- where practicable, and without a significant detrimental impact on efficient aircraft operations or noise impact on populated areas, airspace routes below 7000ft AMSL should, where possible, be avoided over Areas of Outstanding Natural Beauty and National Parks as per Chapter 8.1 of the 2014 Guidance; and
- all changes below 7000ft AMSL should take into account local circumstances in the development of airspace structures:

*The concept of altitude-based priorities reflects the Government's desire that only significant environmental impacts should be taken into account when considering the overall environmental impact of airspace changes. Any environmental impacts that are not priorities based on the above altitude-based criteria do not need to be assessed since the assumption is that they would not be significant.*

C25. Subject to Section 70 of the Transport Act, the CAA is directed by the Secretary of State to perform its air navigation functions in the manner that it thinks best calculated to take into account the following:

- The Secretary of State's guidance on the Government's policies on sustainable development and on reducing, controlling and mitigating the impacts of civil aviation on the environment and the planning policy guidance it has given to local planning authorities.

- The need to reduce, control and mitigate as far as possible the environmental impacts of civil aircraft operations, and in particular the annoyance and disturbance caused to the general public arising from aircraft noise and vibration, and emissions from aircraft engines.
- At the local, national and international levels, the need for environmental impacts to be considered from the earliest possible stages of planning and designing, and revising, airspace procedures and arrangements.

C26. The CAA is also specifically directed, where changes are proposed to the design or the provision of airspace arrangements, or to the use made of them, to:

- Where the changes might have a significantly detrimental effect on the environment, advise the Secretary of State of the likely impact and of plans to keep it to a minimum.
- Where such changes might have a significant effect on the level or distribution of noise and emissions in the vicinity of an airport, ensure that the manager of the airport, users of it, any local authority and any organisation representing the interests of person in the locality have been consulted.
- Where such changes might have a significant effect on the level or distribution of noise and emissions under the arrival tracks and departure routes followed by aircraft using an airport but not in its immediate vicinity, or under a holding area set aside for aircraft waiting to land at an airport, ensure the manager of the airport and each local authority in the areas likely to be significantly affected by the changes have been consulted.

C27. Further, the CAA is specifically directed where such changes might have one or more of these effects the CAA shall refrain from promulgating a change without first securing the approval of the Secretary of State.<sup>23</sup> The Secretary of State

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<sup>23</sup> Although the 2017 directions contain a new threshold for the Secretary of State's call-in criteria, the CAA is guided by paragraph 6.9 of the Secretary of State's guidance to the CAA on its environmental objectives that the new call in criteria do not apply to proposals submitted to the CAA for decision before 1 January 2018

has given no further direction nor guidance on the interpretation of these directions. Therefore the CAA proceeds on the basis that (a) the overall exposure to noise must increase to a level that exceeds 57dB LA<sub>eq</sub>16 hour as a result of the changes proposed; and (b) the increase in the level of exposure to noise must in itself exceed 3dB. The 57dB figure is drawn from the Government's own Aviation Policy Framework<sup>24</sup> (paragraphs 3.12 to 3.19 of the APF), in which it is stated that the Secretary of State would continue to treat the 57dB LA<sub>eq</sub> 16 hour contour as the average level of daytime aircraft noise marking the approximate onset of significant community annoyance. The 3dB figure is one that has been used in the Government's APF in relation noise policy (i.e. as a trigger for acoustic insulation).

C28. Any airspace change that a sponsor asks the CAA to approve follows a seven stage process known as the CAA's airspace change process. On 1 January 2018 a new CAA airspace change process came into force. However, that process does not apply to proposals that apply the 2014 Secretary of States guidance on environmental objectives, or for proposals that were consulted on before 1 January 2018. Accordingly, this proposal remains on the CAP 725 process<sup>25</sup>. A summary of that process is available on the CAA's website<sup>26</sup> and is also shown here.

## The seven-stage process of an airspace change

### Stage 1 – framework briefing

We meet with the organisation that is considering proposing an airspace change to discuss their plans, the operational, environmental and consultation requirements for proposing a change and set out the how the CAA process will run.

### Stage 2 – proposal development

The organisation that is considering proposing the airspace change begins to develop design options and researches who needs to be consulted. They will also conduct an

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<sup>24</sup> [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/153776/aviation-policy-framework.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/153776/aviation-policy-framework.pdf).

<sup>25</sup> Published in CAP 724 <https://www.caa.co.uk/CAP724> and CAP 725

<https://www.caa.co.uk/CAP725>

<sup>26</sup> <http://www.caa.co.uk/Commercial-industry/Airspace/Airspace-change/Airspace-Change/>.

initial environmental assessment of the proposals which will need to be more detailed if, and by the time, the organisation proceeds with its proposal and prepares for consultation. It is recommended that the organisation invites a cross-section of parties who may be affected by the change to form a Focus Group to help with the development of the design options.

### **Stage 3 – preparing for consultation**

The organisation that is considering proposing the airspace change decides on the most appropriate consultation method needed to reach all consultees. This could include a written consultation, questionnaires or surveys, using representative groups and open/public meetings. We will provide advice to the organisation on the scope and conduct of the consultation but it remains their responsibility to ensure that the appropriate level of consultation is undertaken. Consultations should normally last for at least 12 weeks with consideration given to longer timescales where feasible and sensible. Consultation documents should be clear about the objectives of the proposal, what is being proposed, how the change would affect various stakeholders, the expected advantages and disadvantages of the proposals to all stakeholders, the consultation process and the scope to influence. If a single design option is being consulted upon, the document should state what other options were considered and why these were discarded.

### **Stage 4 – consultation and formal proposal submission**

When the consultation is launched the organisation that is considering proposing the airspace change should make every effort to bring it to the attention of all interested parties. The organisation must ensure that accurate and complete records of all responses are kept. Following the consultation, the organisation collates and analyses all responses to identify the key issues and themes. There may be airspace design modifications in light of the consultation responses which results in the need for further consultation. The organisation is required to publish feedback to consultees. If the organisation decides it will submit a formal airspace change proposal to us to then its feedback document must include information on how the final decision on the option selected was reached. In addition to publishing the feedback report the organisation sends all the consultation responses to the CAA within its formal proposal submission.

### **Stage 5 – our decision**

We undertake a detailed assessment of the proposal and may ask for clarification or supplementary information from the organisation requesting the change. Our assessment covers:

1. the operational need for, objectives and feasibility of the changes proposed;
2. our analysis of the anticipated environmental benefits and impacts if the change were made; and
3. an assessment of the consultation carried out by the organisation proposing the change and of the responses received to that consultation.

Our conclusions in these three areas inform our decision whether to approve or reject the proposal. When making our decision the law requires us to give priority to safety but then to balance the need for the most efficient use of airspace with the needs of operators of aircraft and the environmental effect of aviation (including noise and CO<sub>2</sub> emissions). The means by which we assess and balance the environmental impact within our decision making process is set out in government policy which we implement. We normally aim to make our decision within 16 weeks of having all the information we need.

### **Stage 6 – implementation**

If a change is approved then changes to airspace procedures and structures are timed to start on internationally specified dates which occur every 28 days on so called AIRAC-dates.<sup>27</sup> This ensures that the aviation community, as a whole, is aware of the changes and can prepare. In addition, the organisation that proposed the change should publicise the airspace change to members of the local community and other stakeholder groups who were consulted earlier in the process.

### **Stage 7 – operational review**

Around 12 months after a change is implemented we will start a review of the change to assess whether the anticipated impacts and benefits, set out in the original airspace change proposal and decision, have been delivered and if not to ascertain why and to

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<sup>27</sup> An internationally agreed system for the regulated co-ordination of aeronautical information updates and publication that occurs every 28-days on specified dates which apply globally.



determine the most appropriate course of action. Once complete we will publish the review on our website.

**PIR process:** The PIR of this change will follow the process set out in CAP 1616. However when assessing the expected impacts and benefits we will use the methodology followed when making this decision and the guidance on our environmental duties in the 2014 guidance.

## Annex D

## UK's International Obligations relating to Performance-Based Navigation

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- A. In 2010, the International Civil Aviation Organisation (ICAO) Assembly agreed Resolution A37-11 on PBN Global Goals. The Assembly Resolution required States to complete a PBN implementation plan to achieve:
- the implementation of RNAV 1 and RNP operations (where required) for en-route and terminal areas according to established timelines and intermediate milestones; and
  - the implementation of approach procedures with vertical guidance for all instrument runway ends, either as the primary approach or as a back-up for precision approaches by 2016.
- B. The Assembly Resolution was not a mandate and the UK acknowledged that whilst making every effort to meet the 2016 date, the implementation of approach procedures at all instrument runway ends may take longer.
- C. The European Commission Implementing Regulation (EU) No 716/2014 on the Establishment of the Pilot Common Project supporting the implementation of the European Air Traffic Management Master Plan sets out six air traffic management functionalities to be deployed in pursuance of the Single European Air Traffic Management Research programme. In the UK, the RNP 1 PBN specification is mandated for terminal airspace and the RNP APCH PBN specification for approaches at Heathrow, Gatwick, Stansted and Manchester Airports from 1 January 2024. This implementation must be co-ordinated and synchronised to ensure that performance objectives are met.
- D. The European Commission has also proposed a regulation<sup>28</sup> implementing PBN across airports and airspace outside of the scope of the PCP. The regulation was agreed at the Single Sky Committee (SSC) in June 2018 and should be published later this year. EASA is currently finalising acceptable means of compliance and guidance material to be published in conjunction with the regulation. The PBN implementing regulation will require airports with non-precision instrument runway ends to implement 3D PBN instrument approaches (RNP APCH) by 03 December 2020 with

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<sup>28</sup> COMMISSION IMPLEMENTING REGULATION (EU) .../... of XXX laying down airspace usage requirements and operating procedures concerning performance-based navigation

implementation at existing precision runway ends by 25 January 2024. All instrument runway ends with an established SID or STAR will have to ensure that at least one of them is RNAV 1, as a minimum, by 25 January 2024. Helicopter operations are also addressed with a compliance date for routes by 03 December 2020. The implementing regulation requires that there will be the *exclusive use of PBN* by 06 June 2030 with the removal of conventional navigation infrastructure and procedures commensurate with the transition to that environment.

- E. Notwithstanding the European Commission regulations, the UK supports the more widespread use of PBN in implementing a systemised route structure in terminal airspace. This is currently described in the UK Future Airspace Strategy<sup>29</sup> (FAS) and is consistent with European regulation timelines and may be supported by further regulatory intervention (local mandates), where justified.
- F. In summary, the UK is under an obligation to ICAO and the European Commission to transition to PBN-based procedures in all flight phases. At a national level, the Airspace Modernisation Strategy is seen as bringing additional capacity, improved efficiency, enhanced safety and environmental benefits to UK airports out to beyond 2030. The PBN building-blocks of RNAV 1 and RNP APCH are seen as the first step and will not preclude the use of more advanced PBN specifications as they become more widely available in the operating fleet

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<sup>29</sup> The UK FAS will be superseded by the Airspace Modernisation Strategy by the end of 2018.

## Annex E

## CAP 725 Chronology for this proposal

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### Framework Briefing

- E1. An initial Framework Briefing (FWB) took place at CAA House on 15 June 2012. The FWB objective was 'to keep as much Farnborough inbound aircraft to runway 24 in controlled airspace for as long as possible'. This would be achieved by raising the climb profile of certain Heathrow departures. Farnborough stated this would enhance safety of Farnborough operations by reducing the time inbound aircraft to runway 24 would be operating in Class G uncontrolled airspace.
- E2. The first CAP 725 Farnborough airport sponsored airspace change proposal (ACP) FWB took place at CAA House on 15<sup>th</sup> February 2013. The outline of how TAG Farnborough wanted to implement its airspace change proposal was presented by both NATS Farnborough (air traffic service provider) and NATS Services Limited (NSL). The meeting discussed the rationale for the introduction of the new ATC procedures and how options for airspace required to contain the procedures would be represented. It was agreed that due to the complexity and nature of the ACP, it would be sensible to have future FWBs as required. See below.

### Consultation

- E3. The first round of consultation on Option 25 ran from 3 February 2014 to 12 May 2014. The external consultation documents and associated appendices provided an introduction and overview and details of the proposed changes to the airspace structure.
- E4. Following completion of the first consultation period and the publication of Feedback Report Part A on 29 August 2014, Farnborough undertook the introduction of a redesign of the airspace to reduce the impact on other airspace users.

- E5. Feedback Report Part B preparation and the redesign process ran from 29 August 2014 until the publication of Feedback Report Part B with the proposed Option 34 design. A FWB update took place on 14 November 2014. The update identified what would change due to the consultation feedback: A re-profiling of the SIDs enabled Farnborough to reduce the size and volume of proposed new CAS, with the CTR significantly narrowed and slightly shortened, CTA bases raised and simplified where possible, particularly in relation to the locations that impact on Lasham local gliding activities.
- E6. Feedback Report Part B was published and the Airspace Change Proposal (ACP) (referred to as Option 34) (including annexes) was submitted to the CAA, on 3 July 2015 for a decision. The CAA commenced work on its assessment of the airspace change proposal including an Airspace Regulation Case Officer working on the first Case Study/Annexe C/operational assessment, which ran from 4 July 2015 to 29 October 2015.
- E7. The CAA received a Future Airspace Strategy VFR Implementation Group (FASVIG) paper that highlighted its concerns with the detail in the revised Option 34 ACP, namely questioning the justification for CAS in the Farnborough area, and stating that other strategic options should be considered by the CAA.
- E8. The Concept of Operations (CONOPS) document submitted as part of the ACP identified that there was a procedural conflict involving one of the Farnborough inbound procedures and any potential slow climbing aircraft from Gatwick's runway 26 on a KENET departure. The case officer and the SARG en-route air traffic management (ATM) safety specialist suggested that the CAA assessment process should be paused to investigate the issues raised in the FASVIG paper and the CONOPs. Manager Airspace Regulation endorsed the recommendation and CAA's assessment of the proposal stopped on 20 October 2015.
- E9. Farnborough undertook further development of the design between 31 October 2015 and 9 August 2016, including two periods of procedures validation simulations, a General Aviation (GA) workshop and a further FWB

update with the CAA. Farnborough revised their airspace change proposals and a second formal Consultation period of 12 weeks took place. This consultation was on the elements of the revised proposal that differed from that in the airspace change proposal submitted to CAA in July 2015 and is referred to as Option 38. That consultation ran from 10 July 2016 to 2 November 2016, which included a Public Meeting in Midhurst on 1 September 2016 followed by a second, on 20 September 2016.

- E10. Concurrent with the second consultation period on Option 38, the CAA facilitated and mediated, four sponsor (Farnborough) and general aviation (GA) stakeholder workshops, at CAA House, on 4 July 2016, 2 September 2016, 9 November 2016 and 7 December 2016. The purpose of the workshops was to see whether airspace access arrangements could be agreed between all airspace users and Farnborough for the airspace design set out in the ACP as amended by the modifications to that proposal referred to as Option 38.
- E11. From 2 November 2016 to 13 December 2016, Farnborough commenced preparation of Feedback Report Part C. This included the revised airspace design, which resolved the CONOPs ATM issue with the KENET departure. Farnborough submitted Feedback Report Part C to the CAA as a revision to the airspace design submitted as an airspace change proposal submitted to the CAA in July 2015. The CAA accepted this revision to the proposal. At the same time, 14 December 2016, Farnborough published Feedback Report Part C. The CAA recommenced its assessment of Farnborough's proposal, as revised by Option 38, on 16 December 2016. This assessment included the CAA's second case study commenced on 17 December 2016 and until 30 September 2017. when the CAA's operational, consultation, and environmental assessment documents began finalisation.

## Annex F

## CAA Analysis of the Material provided

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- An Operational Assessment which is designed to brief the decision maker whether the proposal is fit for purpose. This assessment contains:
- The CAA's assessment of the airspace change proposal justification and options considered.
- The CAA's assessment of the proposed airspace design and its associated operational arrangements. An assessment of the design proposal is produced to illustrate whether it meets CAA regulatory requirements regarding international and national airspace and procedure design requirements and whether any mitigations were required to overcome design issues.
- The CAA's assessment of whether adequate resource exists to deliver the change and whether adequate communications, navigation and surveillance infrastructure exists to enable the change to take place.
- The CAA's assessment of whether maps and diagrams explain clearly the nature of the proposal.
- The CAA's assessment of the operational impacts to all airspace users, airfields and on traffic levels and whether potential impacts have been mitigated appropriately.
- The CAA's conclusions are arrived at after a CAA Case Study. An Operational Assessment is completed for all airspace change proposals and forms a key part in the CAA's decision-making process as to whether a proposal is approved or rejected. The Operational Assessment will also include any recommendations for implementation such as conditions that should be attached to an approval, if given.
- An Environmental Assessment which reviews the Environmental Assessment provided by the sponsor requesting the change. The review assesses whether the sponsor has provided the data and information that had been agreed at the Framework Briefing or in subsequent correspondence, and must be provided as part of the proposal. The requirements are based on the guidance in CAP 725 (see [3]). Those requirements have been designed to facilitate the

assessments that the CAA must make when considering the environmental impact of the change. The CAA reviews the assessments made by the sponsor as part of the proposal to determine if they have been undertaken properly and the conclusions are reasonable. The CAA will check a sample of the sponsor's results and may, in some cases, undertake its own analysis. The CAA then prepares a report summarising the environmental impacts of the proposal outlining the anticipated impacts of the change if it were to be implemented, for consideration along with all the other material by the CAA decision maker.

- A Consultation Assessment designed to brief the CAA decision maker on whether the proposal has been adequately consulted upon in accordance with the CAA's regulatory requirements, the Government's guidance principles for consultation and the Secretary of State for Transport's Air Navigation Guidance. The assessment will confirm whether the change sponsor has correctly identified the issues arising from the consultation and has responded to those issues appropriately. The assessment will rely, in part, on a comparison of the sponsor's consultation feedback report against the actual responses provided by consultees.



Annex G

# Analysis of Stakeholder feedback received by the CAA

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## Report on additional material provided to Airspace Regulation as part of engagement activity on access to Farnborough's proposed change to airspace

### Executive Summary

This report provides consideration of the airspace elements in the documents provided to the CAA as part of the flexible use of airspace activity, facilitated by the CAA's Future Airspace Team, to explore ways of better facilitating flexible access to the airspace change being proposed by Farnborough. Consideration was also requested of the FASVIG R/T loading tool that was demonstrated to the CAA in 2017.

The two documents which suggested changes to the airspace arrangements proposed by Farnborough propose similar solutions which would lessen the impact on those who wrote the documents - other GA users - by reducing the volume of new controlled airspace and altering the routes that Farnborough arrivals and departures would take.

Both documents suggest a similar solution, the increased use of the LTMA, which would not be acceptable to the ANSP responsible for providing ATS in the LTMA so would not be a viable proposal for Farnborough to take forward.

In one of the documents, the *Revised Airspace Design*, there is another suggestion of low-level VFR corridor which did form one of Farnborough's earlier options but was not taken forward. The suggestion in the *Revised Airspace Design* is potentially a viable option but the proposal would need to be taken forward in a new Airspace Change Proposal to understand the impacts.

The FASVIG R/T loading tool was presented to the CAA in April 2017 and appeared to be a very useful way to demonstrate how a volume of airspace is used and what the likely R/T loading would be using standard phraseology. The cost for use of the tool is high which might deter some of the smaller sponsors from using it and the CAA ATS Inspector in attendance highlighted that his role was to ensure ATS units had sufficient resource, which should mitigate R/T loading issues.

## Introduction

Following a meeting on 6 February 2017 attended by GDSARG, General Counsel and Manager AR it was agreed that a report should be written which would consider the airspace elements in the documents provided to the CAA as part of the facilitation on flexible use of airspace activity, by the CAA's Future Airspace Team, to explore ways of better facilitating flexible access to the airspace change being proposed by Farnborough. The facilitation report can be found in Appendix A.

Consideration was also requested of letters from Southdown Gliding Club and The Royal Aero Club as well as the FASVIG R/T loading tool that was demonstrated to the CAA in 2017.

This report has been written in response to the meeting note which can be found in Appendix B.

## Review of additional material

[Revised Airspace Design dated 20 December 2016 \(embedded within Appendix A and in full in Appendix C\)](#)

### Airspace and route design

Both options (1.1 and 1.2) proposed in this document consist of a slightly smaller CTR, with CTR2 replaced by a CTA with a base of 1,500 feet amsl, retention of CTA1 as it appears in Farnborough's proposal and CTA to the south of the airport with the same dimensions as CTA4 but extending south 6nm perpendicular to the runway at Farnborough.

Both options require an earlier turn to the south than in Farnborough's proposal and require aircraft to climb directly into the LTMA to remain within CAS.

Both options for Runway 06 use the departure route proposed in Farnborough's proposal before it joins the departure route to the south. It is unclear from the document if the Revised Airspace Design proposal aims to retain this easterly departure route as an RNAV1 SID or as an NPR/PDR.

For both options, it is stated that there may need to be an intermediate stop altitude on the departures to avoid conflict with the LTMA traffic above. This is described in the Revised Airspace Design as being a proposal that is made "*without knowledge of any special arrangements between Heathrow and TAG/NATS Farnborough*".

Farnborough's design has been influenced by both its own impact on GA operations as well as the interactions with Heathrow and Gatwick procedures in the LTMA, as can be seen through the development of successive options. Considerable simulation was undertaken by NATS Terminal Control and Farnborough to determine the placement of the proposed routes with regard to Farnborough and NATS Terminal Control's current requirements, while attempting to balance the impact on other airspace users below the LTMA.

It is unlikely that the proposed departure routes described in this Revised Airspace Design would be able to be accepted by both Farnborough and NATS Terminal Control as feasible, due to the likely impacts they would have on LTMA traffic. This would also be the case for arriving traffic as the Revised Airspace Design advocates increased use of the LTMA.

This item is not a viable proposal and the ideas contained within these documents have been considered by the sponsor but not taken forward for the reasons detailed.

### North/South Transit

The document proposes a low-level VFR corridor to allow GA traffic to transit the area without an ATC clearance. The proposed solution in the document is for the reclassification of a portion of the London CTR, south of a line from Woolley NDB to the Ockham VOR, surface to 2,000 feet amsl to Class G airspace. The “Bagshot Gap”.

Farnborough consulted on slightly different “Bagshot Gap”, in which the airspace remained part of the London CTR but the ATS in that portion would have been delegated to Farnborough. Farnborough decided against taking the proposal forward as, after simulations, it was observed that it meant a reduction in the available capacity for dealing with VFR traffic in that area.

The concept of a class G VFR corridor is potentially a viable option for a future ACP, although its size and shape may need to be different once stakeholder requirements are ascertained. It would require considerable analysis work to ascertain the likely impact on those on the ground, Heathrow traffic, helicopter route H3 as well as other off-route helicopter traffic, VFR traffic passing through the London CTR via Burnham/Ascot, Fairoaks traffic as well as Farnborough, before a proposal could be developed further.

This item is potentially viable but would need a change sponsor and submission in accordance with the Airspace Change Process detailed in CAP 1616.

### Southdown Gliding Club letter dated 27 December 2016 (Appendix D)

This letter from Southdown Gliding Club echoes the airspace design that was detailed in the Revised Airspace Design.

The main difference was a depiction of a “Better Way for All”, which included a new arrival route to the west of the arrival route proposed by Farnborough.

This new arrival route would remain within the LTMA for longer, producing the same issues of interaction with other LTMA traffic and may interact in an unsafe manner with the proposed departure procedure in the Revised Airspace Design.

This item is not a viable proposal and the ideas contained within these documents have been considered by the sponsor but not taken forward for the reasons detailed.

## Royal Aero Club letter dated 02 January 2017 (Appendix E)

This letter from the Royal Aero Club sets out why the organisation does not believe the Farnborough ACP should be approved. There is no additional information in this letter that constitutes a different airspace proposal.

## FASVIG R/T loading and traffic presentation 12 April 2017

FASVIG presented a tool they had developed which would allow sponsors of airspace changes to assess likely impacts of proposals on GA traffic flows and R/T loading.

It was agreed by the CAA that it could be a very useful tool to sponsors but that the cost of using it may be too high and those aerodromes that could afford it were likely to be able to get similar information from their own noise and track-keeping systems. The ATS inspector in attendance was very interested in the R/T loading tool but also mentioned that as part of the ongoing oversight and regulation of ATS units, assessment of resource requirements was an essential part of his work so the issues that might be identified by the tool were also likely to be identified through ongoing regulation.

The use of FASVIG's R/T loading tool is not required as part of the Airspace Change Process and the ATS Inspector for Farnborough is content that the resources detailed in the proposal are sufficient for the safe operation of the airspace as described.

## Conclusion

The documents provided for review detailed several suggestions to alter the Farnborough proposal to reduce the impact on other GA users. The suggestions would not meet the requirements of the ATS provider for the LTMA and so would not be able to be implemented as described.

The suggestion of a low-level VFR corridor in the south west corner of the London CTR could be examined as part of a future proposal, if a sponsor decided to propose the change.

The FASVIG R/T loading tool appeared to be a useful tool which sponsors could use to access additional information about how a volume of airspace is used and to highlight possible R/T loading issues. The ATS Inspector for Farnborough was content that the resource required for the proposal would be in place at Farnborough.

## Appendix A

### **FARNBOROUGH ACP Proposal – Facilitation report (TAG/NATS and GA)**

#### **Summary**

Four meetings were held between 4<sup>th</sup> July and 7<sup>th</sup> December 2016 which involved representatives from: TAG, NATS, GAA, LGS, MoD, SGC, RAeC, FASVIG, AOPA<sup>1</sup> and of course, the CAA. Discussion was directed towards identification of potential airspace sharing techniques, such as FUA (including variations to ICAO airspace classifications (the use of ‘bolt-ons) and scheduling hours), Letters of Agreement (LoA), and increased use of both Electronic Conspicuity and R/T. The potential for a ‘phased approach’ to the proposed changes was also to be considered.

Following initial scene-setting and meeting rules (by the Chair), each ‘side’ summarised its position; unfortunately, despite repeated efforts to draw players back to the point of offering contributions in answer to the question ‘What do you need to enable continued access to this airspace, and the continuation of your activity, should this ACP (or a variation of it) be approved by the CAA process?’, the debate was repeatedly dragged back to the position of the GA fraternity<sup>2</sup> that the proposal was disproportionate, dangerous and unnecessary. The GA fraternity continued to offer its view of airspace design that (in their view) would satisfy the needs as set-out by TAG; in most part, TAG (and their agent in this work – NATS) repeatedly pointed out that these concepts had been considered in early drafts and were unworkable, and therefore dismissed. In defence of the GA position, they had no sight of the variations considered prior to the submission of the initial ACP.

Relative concerns can be summarised as follows:

(Powered) GA – extended CTR will result in traffic squeeze and, due to GA pilot’s natural reluctance to speak to ATC to enable safe passage through Class D airspace, bunching of traffic through areas heavily congested by gliders with a perceived increase in risk and reduced safety margins. They see the establishment of a suitable Low-Level corridor (ideally with no communications or electronic identification requirement involved) towards the east of Farnborough as the best solution.

Lasham Gliding Society – constraint of their options for local handling (including operations above Odiham airfield) plus some constraint on their cross-country task achievement. Extremely emotive, the most vocal inputs, little understanding/care of the wider positive effects of the submitted proposal (such as environmental gains for those on the ground). Representation at this series of meetings was usually by members who are lawyers, Air Traffic Controllers (ex TC controller) and Airline pilots.

Southdown Gliding Club – ‘Very high’ impact on their ability to return to Parham at the end of cross country trips following the routine settling of the sea-breeze effect to the north of their airfield. Initially, SGC appeared open to some form of bi-lateral engagement with TAG,

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<sup>1</sup> BGA – British Gliding Association; RAeC – Royal Aero Club; LGS – Lasham Gliding Society; SGC – Southdown Gliding Club; GAA – General Aviation Alliance; AOPA – Aircraft Owners and Pilots Association

<sup>2</sup> References herein to ‘the GA fraternity’ mean all attendees listed in footnote 1.

but then allowed itself to be more closely associated with Lasham (either voluntarily, or potentially through pressure of a.n. other (BGA??)). TAG therefore failed to achieve a commitment to a bi-lateral to resolve their issue; TAG clearly and openly stated on a number of occasions that they believed that they have a solution. Southdown representation through a single individual.

The British Gliding Association were also represented at these meetings, with their allegiance clearly towards the argument of the local clubs, and with the wider (national) policy of argument against increased establishment of CAS. They were of course less emotional and more political in their inputs, but did stand firmly behind the local clubs inputs.

The Royal Aero Club attended these meetings with their concerns more generic – the proposal is disproportionate, unsafe, unfair... . The representative appeared to present himself as the body most likely to generate a harmonised and collective view from the GA fraternity, and there was some evidence at times of that; however, we still do not have written input to this facilitated process other than formal letters written by the Manager at LGS and purporting to represent all GA involved.

After instruction from the Chair, both sides were encouraged to meet on a bi-lateral basis (e.g. TAG and SGC, TAG and LGS, TAG and GAA) between the regular scheduled meetings to discuss specifics of the needs for each organisation. Despite repeated calls by TAG for such dialogue, only one such meeting took place – on a Saturday morning, between TAG and (at the insistence of the GA fraternity) representatives from LGS, SGC and GAA; that meeting was relatively brief and perfunctory in nature (i.e. presentation of ideas from the GA fraternity to TAG for TAG to then go away and consider. There was no active exchange at that meeting). Additionally, the facilitator offered bi-lateral support between the CAA and the individual parties; only TAG/NATS took up that offer and 3 separate meetings were held (at Farnborough) through the Sep-Dec period.

At no stage during the facilitated process did we successfully get to the point of discussion on the concepts of FUA, LoA, R/T use etc etc etc. Joint (all party) meetings were well-mannered and respectful, but 'edgy', with zero trust evident on the side of GA, and little (if any) belief on the TAG side that new and as yet unconsidered options in design would appear. However, one particular issue related to CTA 7 highlighted very clearly by SGC, and acknowledged by TAG, will need to be addressed.

Attached at Annex B and C you will find 2 documents proposing the position and concepts agreed by the GA fraternity with respect to this ACP. The text of the email covering delivery of these two documents is at Annex A; the rationale behind the 'confidential/non-confidential' versions is hard to follow but I presume is predicated on the supposition that 'a mole' within Farnborough NATS is passing data to LGS to allow their own interpretation of the information.

## **Background**

Following the submission to the CAA in July of 2015 of an Airspace Change Proposal (ACP) concerning TAG Farnborough Airport and its environs, the CAA commissioned its Future Airspace Strategy (FAS) VFR Implementation Group (FASVIG) to consider options for airspace sharing between users of that airport and General Aviation (GA) users in the region. That report (dated 13<sup>th</sup> May 2016) led to an initial meeting between all involved (CAA, MoD, GAA, NATS, TAG, BGA, RAeC, AOPA, LGS and SGC) held at CAA House on 4<sup>th</sup> of July 2016. Following intense discussion at that meeting, the offer was made by the CAA to facilitate a series of up to 4 meetings (to be held before the end of 2016); anticipated attendees would be those listed previously. Chairmanship/Facilitation role was given to [REDACTED] [REDACTED] – he holds no position in the CAA ACP process AND although a 10 year employee of the CAA, has been away from the centre on successive secondments, making him perceptibly ‘independent’ – he was to be aided by the members of FASVIG in this work.

The aim of this series of meetings was ‘to identify, discuss and agree resolution(s) to the following points:

- Airspace Classification, including modification to inbound routeing;
- Airspace access arrangements (to include potential Letters of Agreement/airspace sharing);
- Potential for use of Radio Telephony (R/T) and the R/T to be used by gliders;
- Consideration of proceeding on a multi-phase basis with the potential for some elements to be on a trial basis.’

Any tangible output would be submitted by the Chair/Facilitator to the internal CAA ACP process for consideration by the decision-making mechanism.

A further formal consultation on a new partial option was initiated by TAG to address ‘CONOPs related issues’ identified at the early stages of the CAA consideration of the initial submission. The CAA made the unusual step of pausing the ACP process clock to enable this second consultation to take place, and in parallel, to allow the additional facilitated meetings to go ahead.

## **Engagement**

Initial meeting – 04<sup>th</sup> July – CAA House

1<sup>st</sup> subsequent meeting – 22<sup>nd</sup> September – CAA House

2<sup>nd</sup> subsequent meeting – 09<sup>th</sup> November – Aviation House

3<sup>rd</sup> subsequent meeting – 07<sup>th</sup> December – Aviation House



Attendees – CAA (Future Airspace Team with secretarial support from Airspace Regulation Team), TAG, NATS, FASVIG, GAA, SDC, LGS, MoD (SATCO from RAF Odiham, and DAATM), RAeC, BGA and AOPA.

Format – Initial, 1<sup>st</sup> and 2<sup>nd</sup> subsequent meetings – Boardroom, Plenary; 3<sup>rd</sup> subsequent meeting - ‘ACAS style’ (separate rooms for ‘each side’) with conciliation activity performed by FASVIG members and a floating ‘active observer’s role’ performed by the facilitator.

Despite pleas from the facilitator to avoid ‘looking backwards’, repeated inputs and argument regarding notes of earlier meetings was prevalent. The facilitator consistently eased the conversation towards recognition of the real-time situation: TAG had submitted one proposal, a second would follow that would pick-up shortcomings from the CONOPS and that the internal and well-described (in CAP725) process would consider the reasonableness of those applications. This was therefore the opportunity for the GA fraternity to initially highlight alternate design options that could be considered and, more importantly, discuss airspace sharing techniques that would enable continued access to the region for whatever design was ultimately approved (if at all) by the CAA process.

All were reminded that it was within the proposer’s rights to submit as and when it felt ready, for which it would bear the risk that such a submission could be denied by the process if such a submission was deemed not to have considered the needs of other users, was disproportionate, unnecessary or unsafe. Equally, all were reminded that should this series of meetings fail to produce agreement on a potential group submission to the process (through the facilitator) that offered mitigations in terms of airspace sharing techniques, then the risk of a perceived high-impact on the GA fraternity would be borne by that side of the room.

The nature of debate was characterised by emotion on one-side, and flat/controlled response from the other. TAG was clearly of the opinion that it has considered all available options to fulfil the requirements of the direction it received from its Board, whilst the GA fraternity saw only the demise of their activity, and therefore club and social cohesion. Of the presentations given by the GA fraternity, the LGS and GAA were a little ‘loose’ and at times inexact in their ideas and needs and included design principles that were not in use in the UK (such as TERPS), whereas the one given by the SGC was clear and telling – ‘if you do this, this is the effect!’ The latter of these presentations clearly landed with TAG and their second submission goes some way to addressing the issue.

Little progress was made on the 1<sup>st</sup> and 2<sup>nd</sup> subsequent meetings, but the 3<sup>rd</sup>, under ACAS configuration, enabled a slightly clearer definition of the GA position. However, where the facilitator clearly and distinctly asked the GA fraternity to define its need, thereby enabling consideration of the effect of any proposal on that need, the response was again defensive and negative - ‘define need’! A brief but heated discussion on this issue brought no progress, although again at the facilitator’s suggestion, the GA fraternity agreed that they work further to develop their ‘genesis’ document to try and produce the answer to that question, and their ideas on the solution(s) that would satisfy it. On the understanding that TAG would in all likelihood submit their final proposal within days, the GA fraternity

acknowledged that such a document was probably their last input (outside of traditional lobbying activity). Those documents are at Annex B and C.

## **Output**

The GA fraternity believe that TAG have stopped listening and have no regard for the effect their proposal will have on GA activity(ies); they have submitted (at Annexes B and C) papers that summarise their ideas on airspace design that, in their opinion, could both satisfy the needs of TAG and enable continued almost unfettered activity by the GA fraternity.

The GAA continue to pursue the concept of a new Low-Level corridor to the east of Farnborough which would enable their eased passage with little or no communications or flow restrictions. GAA have endeavoured to have TAG include such a plan to their consultation process; TAG refuse as the plan spits traffic over 2 major conurbations (Woking and Guildford) and they do not see it as being in their interest or obligation to confront these communities with that plan. The anticipated traffic flow figures for that corridor would likely peak at 20 movements per hour.

TAG have submitted their new 'Part C' in respect of the secondary proposal developed as a result of the CONOPS issue, it pays regard specifically to the issue that primarily affects SDC, but whether or not it is sufficient is for the process to decide.

## **Lessons (for future ACPs)**

Transparency – the GA fraternity have repeatedly bemoaned the lack of transparency (mostly aimed at TAG, but have pointed the finger on occasion at the CAA). They see no reason why they should not be given access to all iterations of the proposal(s) and the supporting evidence to it.

Data/information sharing – The GA fraternity has taken it upon itself to analyse the data used by TAG to support their submission(s); they have done so where they have been able to gain access to that material. Indeed, the CAA was sent by LGS a full transcript of an ATC engagement, an abbreviated version of which was utilised by TAG to demonstrate to the group the effect of unidentified GA traffic in the surrounding area on approach traffic to Farnborough.

Note that this transcript and the related GA comment to it was provided to the Facilitator by LGS; the source of the data was requested by the facilitator (as TAG/NATS had refused to share such material, they recognise the possibility of interpretation of raw data without contextual information can be misleading). It was apparent that LGS had gained access to the full electronic file of this engagement (whereas the version used by TAG for demonstration at the 1<sup>st</sup> subsequent meeting was much abbreviated). The Facilitator has as yet received no response from LGS to its request.

The Facilitator offered to raise the issue of sharing of such ACP supporting data with concerned parties, and that the CAAs internal review of the CAP725 process may be an opportunity to consider such a move.

Engagement – A direct and clear requirement of any ACP is the need for engagement with affected parties. That is usually enabled through the use of focus groups at the ACP construct phase and public meetings at the point of consultation. Evidence shows that the public meeting phase can be ‘hijacked’ by those with singular requirements (such as access and freedom of operation) and the resource to lobby at such meetings, whereas the individual citizen or even local community tends to use the fora to seek clarification and raise environmental objections. This effectively gives some a second-bite-at-the-cherry, which tends to be at the cost of others with a less unified voice.

The renewed ACP process makes better allowance for community engagement, but perhaps even more can be done to enforce engagement between the proposer and the users at the initial planning phase?

### **Next Steps**

Internal CAA ACP process restarts its consideration of the existing submission, and that relating to the change driven by the CONOPS requirement.

CAA has offered to keep-the-door-open to further facilitated meetings that would ONLY discuss airspace sharing techniques for whatever decision results from the above mentioned proposals. It has been made clear that the events around this Farnborough related ACP will be played-out across a number of other ACPs around the country, and there was therefore a direct read-across of whatever agreements are reached on such techniques to those other proposals. Annexed A text clearly indicates no desire for further facilitated meetings.

GA fraternity in all likelihood will increase lobbying activity on the CAA, Parliament, individual Ministers and MPs with the over-lying and persistent threat of Judicial Review.

██████████

██████████

**Chair/Facilitator**

██████████

**21 December 2016**

## **Annex A – Email text covering delivery of Annexes B and C**

We write on behalf of the GA community represented at the meetings which have taken place at the CAA on 4 July, 22 September, 9 November and 7 December 2016.

At the meeting on 7 December 2016 we agreed to work on revisions to the GA Community's existing proposal. Our current proposal represents a significant compromise, as the GA Community maintains that there is no legitimate reason for TAG Farnborough to be granted CAS, as no data or information provided by them has demonstrated that such CAS is remotely necessary to promote efficiency at the airport. Furthermore, the ACP options that TAG has put forward not only fail to meet a credible efficiency objective but would cause serious safety problems for other airspace users.

The GA Community have analysed the efficiency data provided by TAG and can confirm that the alleged serious air traffic incidents that apparently cause such delay and efficiency concerns at TAG Farnborough necessitating CAS in fact cause delays of no more than 7 minutes and occur in less than between 0.2% and 0.3% of movements. The missed approaches also referred to by TAG, as a cause of significant inefficiencies, which it also claims contribute to the need for CAS, occur in less than between 0.03% and 0.04% of landings. That such "problems" necessitate the granting of huge swathes of valuable public airspace is simply not supported by evidence. If the CAA were to proceed with a decision to grant such airspace to TAG Farnborough it would amount to a misappropriation of public resources.

We provide under cover of this letter in Annexes 1 and 2 a revised GA proposal providing for some CTR around TAG Farnborough. The version in Annex 1 is confidential and is not to be disclosed to any third party including TAG and NATs. The confidential elements of the proposal have been redacted in the version contained in Annex 2 and this version can be disclosed to third parties. The proposal is a modification of the previous version most recently sent to you on 1<sup>st</sup> December 2016 in that it addresses a number of issues raised by TAG/NATs and the CAA.

In summary the CAS proposed in the new version of the GA Communities' compromise solution which is set out in Annex 1 is now CTR1, CTA1 and CTA4 extending to 6 miles to the southeast and parallel with the runway. CTR2 is replaced with a CTA with a base of 1500 ft amsl and an RMZ from SFC to 1500 ft amsl. Two options are proposed using this same airspace.

In Option1, routes have been changed to use the initial departure of TAG's Option 36, to intercept a track of 160. Analysis is added to show that the route is currently flown and only attracted 6 noise complaints in 6 years.

In Option 2, a different route has been proposed that is also currently flown, attracts no noise complaints and overflies nearly the same number of dwellings as the TAG proposed route. This is an NPR, and does not require CAS to comply with CAP 778. However, it remains within CAS albeit not within the 3 nm to comply with Containment Policy (which would have applied had the route been a SID).

It takes account of the fact that TAG Farnborough is no longer required to implement SID and STAR procedures because AICY/092/2014 has been cancelled.

The proposal also includes the “low level corridor” which has been proposed by the GA community and discussed with TAG Farnborough from time to time. Most recently at the meeting of 7 December, TAG Farnborough told the GA Community that the low level corridor could not be included in any proposal which could be adopted in any decision by the CAA without further consultation as the proposed airspace had not been included in the original consultation documents (or any subsequent consultation). However on further review of the consultation documents we have discovered that TAG Farnborough’s statement about the absence of the low level corridor from the consultation process is incorrect. We refer you to Figure 12 C TR Consulted Option 25 in Paragraph 5.12 of Feedback Report B where airspace equivalent to the majority of the low level corridor (CTA3 [D] 1500-2500) is included in the proposal. Any airspace needed for the low level corridor and not covered in CTA3 [D] as referred to above was consulted upon as part of the original Consultation and is set out in Part E, Figure E5 on page E48.

This proposal has been provided as a result of a careful and thorough analysis of the TAG Farnborough flight paths, the volume of traffic and the use of the airspace around TAG Farnborough by other airspace users. The entire process of analysing the airspace and providing a solution to granting some CAS to TAG Farnborough, while meeting the needs of other users, has culminated in this final proposal by the GA community, which has been developed over more than two years. We have undertaken this considerable work and submitted it to the CAA as part of the ACP consultation process on the understanding that it will be properly considered by the CAA when applying its airspace policy and making a decision as to airspace change.

We refer to your email of 14 December 2016 (received at 13.48) and have seen from the TAG Farnborough website that not only has Feedback Report Part C been submitted to the CAA but TAG has requested the CAA that the ACP process be recommenced with immediate effect. We are grateful for the acknowledgement in your email that the CAA will continue to consider the GA Community’s proposal notwithstanding TAG’s submission of Feedback Report C and its request that the ACP process be restarted.

We note that you state that the CAA remains open to fostering further dialogue relating to Flexible Use of Airspace (“FUA”), Radio Telegraphy (R/T), electronic conspicuity and letters of agreement (LOAs) in the New Year. In the meeting held on 22 September 2015 you stated on behalf of the CAA that FUA is an imprecise concept with no proper definition of how it is to be implemented. In practical terms, the GA Community’s proposal already promotes flexible use of airspace, in the commonly understood meaning of the phrase; it comprises CAS in the immediate vicinity of TAG Farnborough with the remaining airspace outside of that zone continuing to be designated as Class G so that all airspace users can continue to use that airspace in a safe and flexible way. The GA Community will not need any further access to the CAS it has set out in its Annex 1 to the proposal. The Community is therefore of the view that the need for further consideration of R/T, electronic conspicuity and LOAs is redundant.

Please note that any correspondence sent by LGS to the CAA is confidential and is not to be disclosed or shared with third parties without our permission.

## Appendix B

### Meeting Note

Progressing Stage 5 of the Farnborough ACP

Monday 6<sup>th</sup> February 2017. Aviation House, 3NW Gatwick

In attendance:

[REDACTED]

[REDACTED] - On telephone

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

GDSARG outlined the current position. The TAG Farnborough airspace change proposal had reached Stage 5 of the Airspace Change Process (ACP), TAG having submitted their proposal with supporting material to Airspace Regulation (AR).

**It was explained that during a period of 'stopped clock' within Stage 5, in order** that interface and timing issues between the relevant ATC Units could be resolved, a parallel flexible use of airspace activity was facilitated by the Future Airspace Team (FAT). The activity brought together a group consisting of TAG, their service provider, FASVIG and stakeholder GA groups. The group was to **investigate ways of better facilitating flexible access to the 'new' airspace** should it be approved by GDSARG. Immediately prior to the commencement of Stage 5 the Future Airspace Team presented a report of this work back to the group and Airspace Regulation.

Shortly after the commencement of Stage 5 three stakeholder GA groups (Royal Aero Club of the United Kingdom, General Aviation Alliance, British Gliding Association and Lasham Gliding Society) submitted two detailed letters to the CAA expressing their concerns about the TAG Farnborough proposals, suggesting

alternatives and their considered next steps should the airspace change proposal be approved by DIR SARG.

GDSARG was keen to ensure that this additional material (the FUA report and three letters) was given full and proper consideration, and that it could be later demonstrated that this had occurred.

Two potential options were considered by the meeting. Treat the three letters and report as a second airspace change submission, to be run in parallel to the TAG ACP submission or solely run the standard ACP for the TAG submission, but simultaneously using another AR Case Officer to create a report on the additional material.

The option of running a parallel ACP was discussed at length. It was felt that whilst this normally ensured an appropriate degree of rigour, it did depend on submitted material being detailed, wide ranging, fully considered, consulted upon and having a sponsor; in other words having been progressed in accordance with ACP Stages 1 to 4; but it was agreed that this was not the case. Additionally, the two letters arrived after the closure of the second 12 week consultation and the FAT report was concluded as an independent activity, meaning none had been presented to the change sponsor during their consultation.

The second option involved the creation of a report that collated and reviewed the additional material. This would be undertaken by different AR Case Officer to that tasked with completing Stage 5 of the TAG airspace change submission, in **effect creating a 'Red Team'**. **It was anticipated that the report would identify and list any substantive airspace change elements presented within the additional material.** Each element would then be considered by the Case Officer and a determination made.

*Subsequent to the meeting AR worked up the following three possible determinations:*

*The item was not viable, with reasons given.*

*The item was potentially viable but needed a change sponsor and submission in accordance with the ACP to progress.*

*The item was potentially viable but had been captured and considered previously by TAG, and was consequently been dealt with by AR's TAG ACP Case Officer.*

Once the report was complete it would be appended to the ACP bundle being prepared for GDSARG and the TAG ACP Case Officer asked to reflect its presence within his summing up.

It was agreed by the meeting that option 2 was the most appropriate as it kept **the only airspace change proposal submitted by a sponsor 'clean' within the ACP,** whilst ensuring the additional material was properly considered.



**ANNEX 2**

**REVISED AIRSPACE DESIGN  
NON-CONFIDENTIAL VERSION**

**Date 20<sup>th</sup> December 2016**

## Summary

The design meets TAG's key operational efficiency goals by creating a "*known environment*" so as to minimise any potential disruption caused by "extraneous aircraft".

It incorporates changes to *address known feedback and criticism conveyed by TAG* regarding the earlier GA design proposals in recent face-to-face meetings.

It takes account that Farnborough is no longer obliged to implement SID and STAR procedures because AIC Y/092/2014 has been cancelled.

It provides two routing Options.

### "What Has Changed "In A Nutshell"

The CAS has changed from our previous proposal to be now CTR1, CTA1, and CTA4 extending to 6 miles to the southeast and parallel with the runway. CTR2 is replaced with a CTA with a base of 1500 ft amsl and an RMZ from SFC to 1500 ft amsl. Two Options are proposed using this same airspace.

In our Option 1, routes have been changed to use the initial departure of TAG's Option 36, to intercept a track of 160. Analysis is added to show that the route is currently flown and only attracted 6 noise complaints in 6 years.

In Option 2, a different route has been proposed that is also currently flown, attracts no noise complaints and overflies nearly the same number of dwellings as the TAG proposed route. This is also an NPR, and does not require CAS to comply with CAP 778. However, it remains within CAS, albeit not within the 3nm to comply with Containment Policy had the route been a SID.

## Introduction

At the meeting convened by the CAA on 7<sup>th</sup> December, it stated that the fundamental reason for TAG's ACP was TAG's executive board's requirement that all Farnborough movements be contained within controlled airspace (CAS). We noted that this had also been pointed out previously in FASVIG's report dated 13<sup>th</sup> May 2016.

At the CAA meeting held on 9<sup>th</sup> November, TAG reconfirmed its position, previously stated at the 22<sup>nd</sup> September CAA meeting, that its submitted airspace proposal would also contain SIDs and STARS procedures.

In short, TAG's board requires CAS to contain all movements and that these be undertaken using SIDs and STARS.

To achieve this and to adhere to CAA and ICAO guidelines, TAG requires the creation of an enormous amount of additional CAS in the southeast of England. This, in turn, means excluding other GA users from large proportions of today's existing Class G airspace. It also means significantly reducing the safety in the remaining airspace to the extent that it makes it manifestly dangerous, increasing the risk of collision by a factor of 10.

In summary, TAG's ACP submission is anything but "*proportionate with regard to others affected*", a stated CAA requirement in CAP 725.

As a result, an alternative and proportionate airspace design has been generated in which, apart from 1.5% of the time, TAG's arrivals and departures can use and remain within today's existing CAS. The original design concept was first put forward in Lasham's formal 2014 Consultation Response, then proposed in detail to the CAA on 2<sup>nd</sup> November 2015, 22<sup>nd</sup> September 2016, 9<sup>th</sup> November 2016, 1<sup>st</sup> December 2016, has been presented to TAG on 5<sup>th</sup> November 2015 and reviewed several times since then. Our proposed design has also been conceived as a "genesis" of a final solution (to quote the CAA's own terminology) and we are more than willing to discuss further modifications based on reasonable requirements and evidence.

Our proposal is specifically designed to create a known environment so that "extraneous" aircraft do not cause even the small delays to Farnborough departures, arrivals and approaches concerning Farnborough's runways 24 and 06. This document describes the airspace design and the known factors that have been taken into account in its development:

1. The updated design has two Options, each of which form a different trade-off between environmental noise and proximity to the CAS boundary, taking note of compliancy with the CAA's Containment Policy that would be required by a SID,
2. It maintains the philosophy of proposing CAS, with the addition of a VFR corridor, in which, with a small exception, arrivals and departures can use and remain within the existing CAS,
3. It has been modified to respond to the criticisms from TAG that have been articulated,
4. It satisfies the fundamental needs of the Gliding/GA organisations and pilots.

### 1 The updated design has two Options

The revised "genesis" design consists of two Options, each of which we request the CAA to consider carefully. Both Options keep TAG aircraft within CAS for:

- All departures,
- All arrivals,

- The ILS approach for runway 24,
- A visual JFK Canarsie type approach for runway 06.

ILS approaches for runway 06 would go outside of CAS, but this would be required for only 1.5% of operating hours and not be unsafe.

The alternatives are presented below and labelled Option 1 and Option 2. Both use the same airspace shown in Figure 1A below.

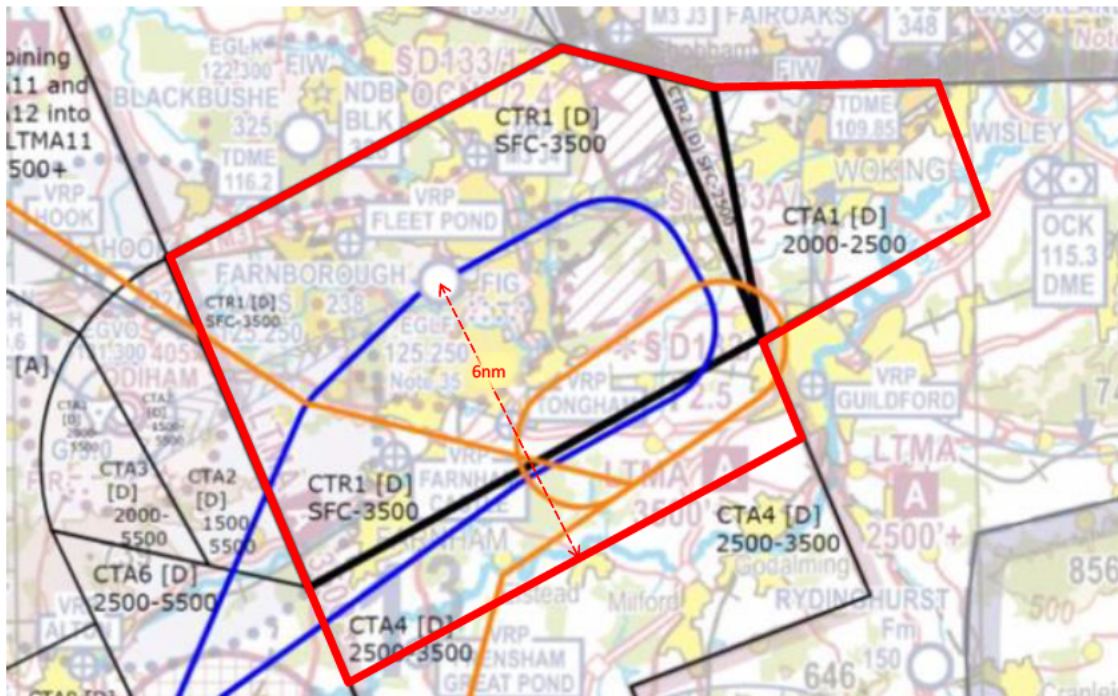


Figure 1A

### 1.1 Option 1

This has the following basic design features and is a *revised* version of the option presented at the CAA meeting on 9<sup>th</sup> November 2016 and described in our e-mail communication to the CAA dated 1<sup>st</sup> December 2016. This latter version used TAG's published NPR. This has now been dropped since we inferred after that meeting that TAG was not proposing to use it. The Option 1 design can be described as follows:

**The departure route** is an NPR, which if it had been a SID would, incidentally, comply with the CAA's Containment Policy being 3 nm from a CAS boundary. The design consists of the following basic features:

- For runway 24, the route is as proposed in TAG's Option 36 until 2 nm, then a turn is made onto a track of 160 degrees, climbing to 4000 ft into LTMA4 (see Figure 1.1A below),
- For runway 06, the route is as proposed in TAG's Option 36, then intercepts the same track of 160 degree with a final stop altitude of 4000 ft into LTMA4. There may be need to be an intermediate stop altitude due to deconfliction from Heathrow MID departures, but this proposal is made

without knowledge of any special arrangements made between Heathrow and TAG/NATS Farnborough.

The airspace extent consists of: CTR1, CTA1 and the part of CTA 4 extending to 6 nm from the aerodrome and parallel with the runway. CTR2 is replaced with a CTA with a base of 1500 ft amsl and an RMZ from SFC to 1500 ft amsl in the form proposed by TAG in its original 2014 Consultation.

The climb gradient required is 7% (whereas it was 9.5% in our previous design).

This design option is, in practice, flown by TAG now and attracts a very small number of noise complaints. This is corroborated by the following:

- Data plotting existing tracks, shown later in Figure 3.2A,
- A review of noise complaints showing that this “status quo” route has attracted only 6 noise complaints in 6 years . This is described later in Section 3.2.

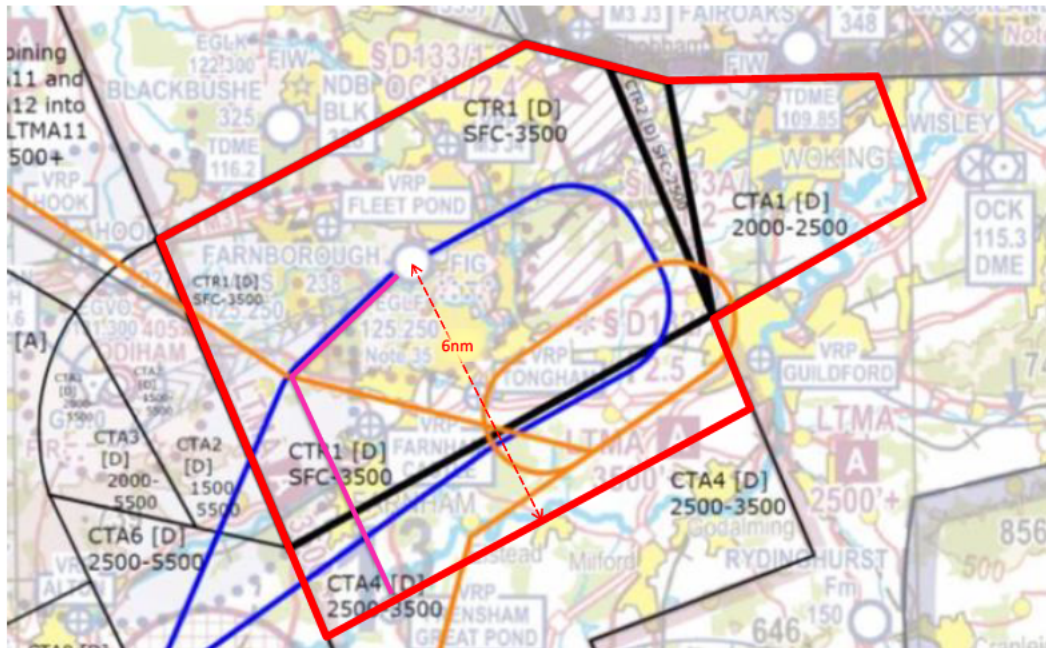


Figure 1.1A

## 1.2. Option 2

This Option is again based on TAG’s CTR, its most easterly CTA and part of CTA4, as shown in Figure 1A above. Note that because it is an NPR it does not need to comply with the CAA’s Containment Policy. This Option’s NPR is only 1 nm from a CAS boundary and not the 3 nm that would apply if it were a SID and the 3 nm used in Option 1 above. It has the following basic design features:

The departure route (also an NPR) and shown in Figure 1.1B below consists of the following:

- For runway 24, the route is as proposed in TAG’s Option 36, then follows the magenta line shown climbing to 4000 ft into LTMA4,

- For runway 06, the route is that proposed in TAG’s Option 36, then intercepts the magenta line with a final stop altitude of 4000 ft into LTMA4. There may need to be an intermediate stop altitude due to deconfliction from Heathrow MID departures, but this is not changed by this proposal.

The airspace extent again consists of: CTR1, CTA1 and the part of CTA 4 extending to 6 nm from the aerodrome and parallel with the runway, shown in Figure 1A above. CTR2 is again replaced with a CTA with a base of 1500 ft amsl and an RMZ from SFC to 1500 ft amsl in the form proposed by TAG in its original 2014 Consultation.

The climb gradient required is 7% to remain 500 ft from the base of the proposed CAS and also the existing LTMA.

This design option is based on the median of the tracks currently flown by Farnborough aircraft and attracts no noise complaints, as demonstrated by the following:

- A review of noise complaints from overflown residents, shown later in Section 3.2.
- Noting that it remains within CAS, although it does not emulate the lateral distance from the edge of CAS as defined in the CAA’s Containment Policy, but also noting that this is not a SID but an NPR and the Policy does not require these to be contained within CAS,
- The track keeping the accuracy attained during the Heathrow trial and used in the NATS DEP Report referred to in CAP 1385, page 35.

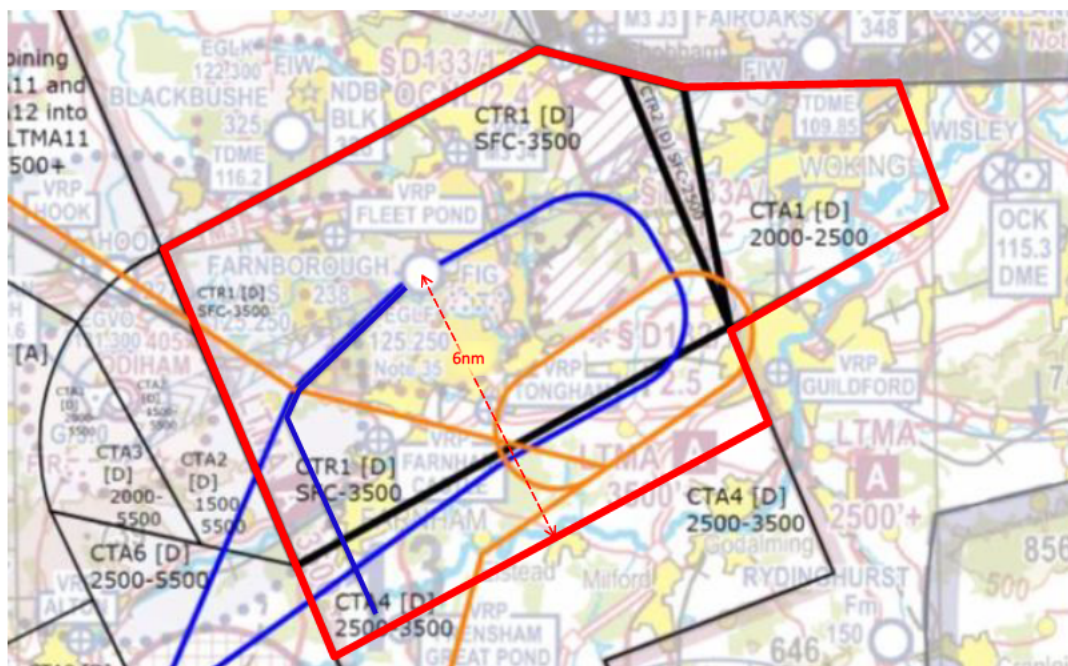


Figure 1.1B

2. It maintains the philosophy of proposing airspace with the addition of a VFR corridor in which, with a small exception, arrivals and departures can use and remain within the existing controlled airspace

With our proposal:

- For all runway 24 movements, observation of flights shows that the majority of aircraft can remain within existing controlled airspace or within the our proposed airspace,
- For runway 06 arrivals, only 1.5% of movements would need to go outside of the proposed airspace limit,
- All 06 departures can enter and remain with the proposed and existing controlled airspace,
- = Examination shows that aircraft are leaving existing controlled airspace prematurely in order to take direct routings,
- Excursions outside of the proposed airspace could also be avoided for both runway directions if all aircraft speeds were kept within legal limits,
- The current handover from Farnborough Radar to London Terminal Control is inconsistent and, with improved coordination, aircraft could be climbed into controlled airspace more quickly,
- North/South transit of powered GA traffic can be achieved by a low-level VFR corridor – The Bagshot Gap.

**2.1 For all runway 24 movements, observation of flights shows that the majority of aircraft can remain within existing controlled airspace or within our proposed airspace**

By way of example, an analysis of flights arriving and departing Farnborough and that used Runway 24 for the period 25<sup>th</sup> to 26<sup>th</sup> September and 7<sup>th</sup> to 8<sup>th</sup> October 2015 was undertaken.

This showed that:

- the vast majority of movements to the East remain within the proposed airspace – the outliers were due to poor vectoring, excessive speed or Fair Oaks' movements,
- some movements to the west of Godalming and south of Farnham were taking a “short route” to the 24 base leg which could be avoided by continuing the inbound track to ROVUS,
- to the southwest of Farnham, the tracks could be mitigated by turning to the southeast and making use of the existing LTMA4.

**2.1.1 The vast majority of movements to the East remain within the proposed airspace – the outliers were due to poor vectoring or excessive speed**

We examined all of the outliers and eliminated those going to or from Fair Oaks. Of the remainder, we discovered that approximately half were travelling at speeds inappropriate for the phase of flight. Half were turned “late” by air traffic control.

**2.1.2 Some movements to the west of Godalming and south of Farnham were taking a “short route” to the 24 base leg which could be avoided by continuing the inbound track to ROVUS**

Inspection of all of such tracks revealed that if the aircraft continued to ROVUS above 3500 ft, they could then be turned and descended onto a downwind leg within the Lasham Proposed Airspace.

**2.1.3 To the southwest of Farnham, the tracks could be mitigated by turning to the southeast and making use of the existing LTMA4**

These tracks were and are presently routing to GWC or HAZEL. This takes them beneath LTMA13, which has a base of 5500 ft. These aircraft could be turned to the southeast and climbed into LTMA4, which has a base of 3500 ft. Arrivals could make use of the existing LTMA to the North West and from the South descending to 5000 ft, coordinated with London.

**2.2 For runway 06 arrivals, only 1.5% of movements would need to go outside of the proposed Airspace Limit**

From an analysis of METAR data, it can be easily shown that it is necessary to fly a full ILS for Runway 06 for only 1.5% of the time. The remainder of the time, a JFK Canarsie approach could be flown. Note that 1.5% refers to time and not number of arrival movements. In such IMC weather, there would be almost no VFR traffic and, in particular, there would be no gliding movements.

Examination of sample tracks showed that many of the flights could remain within the existing and proposed airspace. It was noted that several aircraft took “shortcuts” (e.g. direct from Newbury to the final approach for 06). It would not be possible to contain such “shortcuts” in CAS under either TAG’s or our proposals

A full ILS approach would be outside of the proposed CAS Limit in weather conditions in which there would be almost no VFR traffic.

**2.3 All 06 departures can enter and remain with the proposed and existing controlled airspace**

We analysed the departures from Runway 06 for the period 25<sup>th</sup> September to 14<sup>th</sup> October 2015.

To the southwest of Farnham, it could be seen that the tracks could be kept within existing CAS by turning to the southeast and making use of the existing LTMA4. These tracks are presently routing to GWC or HAZEL. This takes them beneath LTMA13, which has a base of 5500 ft. These aircraft could be turned to the southeast and climbed into LTMA4, which has a base of 3500 ft.

**2.4 Examination shows that aircraft are leaving existing controlled airspace prematurely in order to take direct routings**

We examined the reason why these aircraft had taken such routings. This was achieved by relating the RT from Farnborough Radar, Farnborough Tower, LTC WILLO sector and LTC OCK sector with the aircraft tracks. In this way we were able to determine if the routings were caused by avoidance of other traffic, weather or whether the tracks were just convenient “shortcuts”. The results of this analysis is that there was no traffic or weather imperative for these flights to leave the existing CAS prematurely.

**2.5 Excursions outside of the proposed airspace could also be avoided for both runway directions if all aircraft speeds were kept within legal limits**

We analysed the movements of arriving and departing Farnborough traffic from 10<sup>th</sup> October to 14<sup>th</sup> October 2015.



We specifically noted that a significant proportion of the aircraft were flying excessively fast in Class G airspace. Many had speeds in excess of 250 kt, one being as high as 294 kt. An example is provided in Figure 2.5A summarising movements for 10<sup>th</sup> to 14<sup>th</sup> October 2015 for aircraft that were ADS-B equipped. The average speed of 11% exceeded the 250 kt Class G speed limit and 34% exceeded it at some point during their movements in Class G.

2015	Number exceeding in Class G airspace*			
	Total flights	>250kt avg	>260kt max	Max
10 Oct	19	0	6	294
11 Oct	34	3	11	278
12 Oct	15	3	6	277
13 Oct	24	4	9	294
14 Oct	36	4	11	288
<b>10-14 Oct</b>	<b>128</b>	<b>14</b>	<b>43</b>	<b>294</b>
		<b>11%</b>	<b>34%</b>	

\*Groundspeed data from ADSB transmissions

**Figure 2.5A**

Apart from the safety aspects attributable to this unlawful conduct, it can increase the distance flown in Class G airspace and can significantly increase the radius of turns. The corollary is that the requesting of a lower speed by ATC would in some cases significantly reduce the extent of the distance covered prior to or after exit from the overhead TMA. It would also make it feasible for many flights to remain in the proposed airspace.

We understand that there used to be a Standing Agreement between Farnborough and LTC for arrivals to be transferred at 220 kt. Our observations suggest that this agreement is no longer being used.

**2.6 The current handover from Farnborough Radar to London Terminal Control is inconsistent and, with improved coordination, aircraft could be climbed into controlled airspace more quickly**

We noted specifically that:

- Sometimes, aircraft were handed over to LTC at 3400 ft in Class G and told to remain clear of CAS,
- On other occasions, aircraft were climbed into CAS, and then provided with a Radar Control Service on the Farnborough radar frequency.

By way of example, we noted that, on Saturday 10th October 2015 between 14-00 and 15-00 hrs UTC, there were 6 departures, all cleared directly into controlled airspace. By contrast, in the same period on Saturday 17th October 2015, there were 4 movements of which 2 were cleared directly into controlled airspace.

By definition, if Farnborough climbs aircraft sooner into CAS, then this reduces their period in Class G.

The ability to make this coordination may be on occasion constrained by the activity in WILLO and OCK Sectors, but clearly it is possible to do this and it should be maximised.

We are aware that the present system normally works well and is safe and efficient. We are also aware that any procedure to give quicker access to the presently configured LTMA clearly would have to take account of the periods when LTC was operating at 100% workload and that it would have to maintain separation with Heathrow, Gatwick and Southampton traffic.

We noted that TAG stated in its original Consultation Document that: *“Departing Farnborough aircraft are currently regularly delayed on the ground, often on the runway engines running awaiting take-off clearance, whilst other Farnborough departures/arrivals are handled, and/or GA traffic is coordinated by LARS, and/or unknown traffic passes by”*.

TAG was requested on several occasions to quantify these delays. It stated that this data was not recorded. We found that the delays are minor and infrequent and caused by waiting for release by Farnborough Radar against its own traffic. Such minor delays would not be alleviated by the introduction of controlled airspace. No incidence of delayed release was noted due to GA. We found no incidence of waiting for release by London.

## **2.7 North/South transit of powered GA traffic can be achieved by a low-level VFR corridor – The Bagshot Gap**

TAG’s ACP, as submitted, creates serious safety hazards for powered GA in that north/south flight in class G airspace around London would require routing either east of London City or west of Lasham, both of which areas are already choke points.

Thus an integral part of our proposal is for the reclassification of a small portion of the Heathrow CTR, south of a line from Woolley NDB to Ockham VOR, to become Class G airspace. We call this the Bagshot Gap (SFC to 2000 amsl).

Powered GA aircraft would then have assured transit as needed without crossing Class D airspace, and thus without the requirement to obtain an ATC clearance.

It will be remembered that the Bagshot Gap was first created during the Olympic Airspace period in 2012, and operated without difficulty.

We recognise that, because of the proximity of Heathrow and Farnborough, a known traffic environment is desirable, and that the Bagshot Gap could be designated either a RMZ or a TMZ.

Aircraft using the Bagshot Gap would either route around the Fair Oaks ATZ, or request a clearance through it.

There is only one conflict with the TAG proposed airspace, namely its proposed area CTR2. However, TAG have only proposed CTR2, not because it is needed for aircraft use, but to avoid TCAS alerts to their aircraft inbound on their runway 24 ILS. Given that there are only approximately 2 landings per hour at Farnborough, and that CTR2 is only about one mile wide, inbound Farnborough aircraft would fly over this

airspace for less than 60 seconds per hour on average. Such low usage does not warrant 24/7 Class D airspace, and would be extremely disproportionate.

Thus we urge that CTR2 is denied to Farnborough. TAG can manage their traffic without it, especially in a known traffic environment.

Alternatively, should the Bagshot Gap airspace remain Class D, a low level corridor could be created as exists at Manchester, using the Bagshot Gap airspace.

The above provisions are absolutely essential for powered GA operations in the southern UK. Whilst TAG Farnborough would be obliged to provide a crossing service of their Class D airspace, this would always be dependent on its ATC capacity and traffic, and thus is not an assured or effective solution in this critical location.

We had accepted that this feature of the proposal might well require a separate limited consultation rather like that undertaken for Option 36, since TAG/NATS pointed out at the CAA's 7<sup>th</sup> December meeting that this design feature differed markedly from Option 34/36 that had been subject to a public consultation. However, we have since noted that Option 34 containing CTR2 had never been consulted, only the original Option 25. The latter did contain the low-level corridor (see Feedback Report B section 5.13 on page B33 and Figure 12 plus TAG's original Consultation Document Part E, Figure E5 on page E48). On the basis of this argument and following the logic of TAG/NATS objection, the low-level corridor has already been subject to a public consultation. By contrast, Option 34 and its subsequent derivatives, Options 36 and 38, have not.

The proposed corridor is shown in Figure 2.7A below.



Figure 2.7A

### 3. It has been modified to respond to the criticisms from TAG that have been articulated

These points are the following:

- In answer to the observation that our design does not take account of NW departures, we have adopted an identical position to TAG, which did not propose any NW departures in its proposal,
- TAG stated that arrivals from the south must go into Class G for a short period in our design. This is entirely incorrect because our CAS is designed to contain the existing flight paths, except that the aircraft would have to route towards ROVUS until being turned on to a downwind leg within the proposed CAS,
- In answer to TAG’s criticism that departing aircraft turning south would enter Class G briefly, this is wrong since both Options 1 and 2 require a 7% climb gradient to remain within the proposed CAS and the existing LTMA,
- TAG stated that it needs a solution for arrivals onto 06 which would prevent them having to go into Class G prior to joining the ILS (if possible). However, their aircraft only need to fly an ILS for runway 06 for 1.5% of the operating hours and this also in conditions when no other VFR aircraft would be flying. In addition, they do this safely now,
- Our design contains a known environment to address TAG’s stated issues regarding unknown aircraft, even though there is no data to support TAG’s operating efficiency claims. An analysis of the “event log” data supplied by TAG shows that only between 0.2% and 0.3% of movements experienced any delay of which the average was less than 7 minutes (see Section 3.1 below). Our proposed airspace would remove most of even these small numbers.
- Our design takes note of FASVIG’s incorrectly stated assertion at the 7th November meeting that the CAA does not require SIDs and STARs to be in CAS. This is contrary to the currently published Containment Policy and CAP 778,
- For some years, we have pointed out to TAG that, despite its assertions to the contrary, there was no European or UK legislation that required Farnborough to implement SIDs and STARs procedures. AIC Y 092/2014 was then put in place in December 2014 that unexpectedly mandated such and that temporarily enabled TAG to use it as a fundamental justification for its ACP design. We pointed out that there was no basis for this regarding Farnborough, in particular. The AIC was withdrawn on 15<sup>th</sup> December 2016. Our proposed design is based on there being no obligation for SIDs and STARs to be implemented at Farnborough,
- Our proposed design takes account of TAG’s fundamental requirement that has driven the ACP being entirely an internal management decision that all its movements must be in CAS (stated by the CAA on 7th December 2016). It is *self-imposed and not a CAA requirement*,
- During the discussions at the 7th December meeting and TAG/NATS objections, we had recognised that the proposed low-level corridor would require an additional consultation, rather like that undertaken for Option 36. However, as explained in Section 2.7 above, we discovered that it has been consulted as part of the original Option 25 public consultation. By contrast, using the logic of TAG/NATS objection, Option 34 containing CTR2 and its derivatives, Options 36 and 38, have not,
- Our design recognises that to achieve TAG’s management objective, the remaining aviation community has to accept a tenfold and entirely unacceptable real risk of collision in the choke points created, particularly near and overhead Lasham, and that TAG’s proposed crossing service cannot remove this. To this end our design minimises the extent of the known environment created,

- Our design takes account of Farnborough noise abatement procedures and overcomes TAG’s observation that the route proposed at the 9<sup>th</sup> November meeting overflew Farnham, which was unacceptable (see Section 3.2 below,
- Our proposed design takes account of noise complaints and, in particular, overflight of Farnham by reference to analysis of recorded data (see also Section 3.2 below,
- In answer to the query raised at the 7<sup>th</sup> December meeting, we confirm that departures to the south using 160 initially use TAG’s proposed procedures,
- We carefully checked by flight simulation that the procedures that we have proposed are flyable, see Section 3.3 below.
- TAG stated that it required a known environment through to the en route phase of flight. Our proposed design provides this,
- TAG stated that it did not want the southern boundary of its CTR to be any further south because the ILS for Odiham crossed that boundary. Once inside the CTR, Farnborough would have to provide IFR/IFR standard separation. If the boundary were further south, the traffic would cross the line earlier and closer to Farnborough, which would be a problem for separation with IFR traffic on Farnborough finals. This objection has no merit. Under our amended proposal the lateral dimensions of CTR1 remain unchanged and so this objection would not have any effect. However, the Final Approach Track for Odiham remains within the lateral extent of CTR1, in any event, and so this objection had no validity,
- Our design recognises TAG’s objection that using the current NPR would mean that it would have to reconsult. During the meeting process TAG misleadingly never informed us that they no longer were using their own published NPR and so we continued to assume that they were. Having discovered this, we are now using TAG’s Option 36/38 routing,
- TAG queried that if departures follow the current NPR, would it be able to operate the current departure route. We are proposing that they follow their Option 36/38 initially,
- The CAA and presumably TAG have asked for confirmation that our design is a “genesis” and that we are willing to develop it further. We confirm that this is indeed the case.

At the 9th November 2016 CAA meeting, TAG read out a list of criticisms to Lasham’s then proposed airspace. However, it was not understandable, even to the CAA. It was agreed that TAG would supply these in writing to all participants. This did not happen and the matter was raised several times at the 7th December 2016 meeting. Since nothing has been supplied in this regard, our proposed design necessarily cannot take account of those criticisms for which we have not had sight.

### **3.1 Analysis of the “event log” data supplied by TAG/NATS**

This event log data was eventually supplied by the CAA to the GA community on 28<sup>th</sup> November 2016. It had been redacted and, for example, it was not possible to distinguish between arrivals and departures.

Nevertheless, the results of its analysis reveals per period that:

#### **For 2013 (7 month period provided):**

- From June 2013 to December 2013 there were 13,915 FAB movements (business and helicopters),
- 22 single delays were reported, one multiple delay and cancellation of 29 noise abatement procedures,

- The delays to 19 aircraft totalled 116 minutes, where quantified, and so averaged only 6 minutes per delay,
- The number of movements delayed represented less than 0.2% of the total movements,
- The cancellation of noise abatement was also 0.2%,
- There was one delay of 30 minutes to 7 seven aircraft due to ILS Calibration at EGVO (Odiham), aerobatics on the Hogs Back and busy FIR. This event has been excluded since the EGVO ILS calibration seems the most likely cause and would likely occur with or without CAS.

**2014 (full year):**

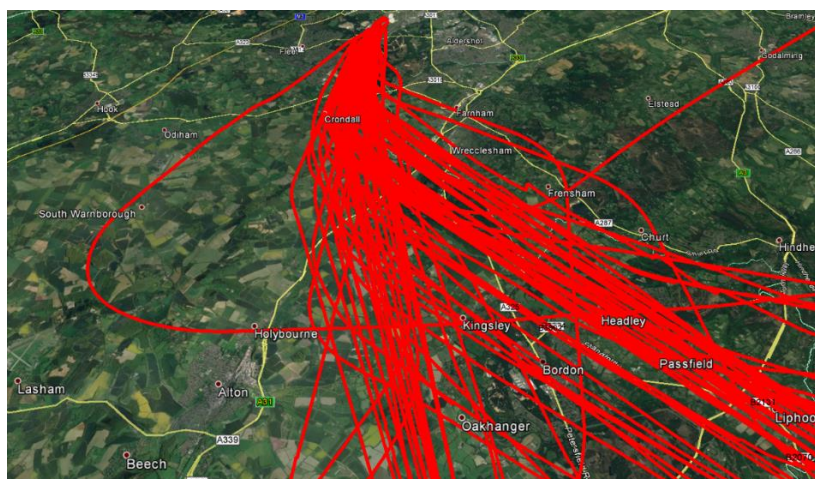
- For the year 2014 there were 23,944 movements,
- The list reported 46 single delays, one multiple delay of "several" and cancellation of 41 noise abatement procedures,
- The 29 delays, where quantified, averaged about 8 minutes,
- The number of movements delayed was about 0.2% of total movements in the year.

**2015 (6 month period):**

- From January 2015 to June 2015 there were 12,099 movements,
- There were 30 single delays and 2 delays described as multiple but the number of aircraft were not specified and 15 noise abatement procedures were cancelled,
- The average of the reported delays in this period, when they were quantified, was less than 7 minutes,
- The 'multiple' delays were not described in any detail,
- The flights delayed by single events represented about 0.3% of total movements.

**3.2 Farnborough Noise Abatement and overflight of Farnham**

TAG stated that our proposed routings overfly Farnham which was unacceptable. Our route, however, was just the present status quo, which is shown in Figure 3.2A below displaying 70 tracks selected statistically at random of runway 24 departures since August 2015.



**Figure 3.2A**

Our Option 1 route is also represented by the magenta line from LF001 in Figure 3.2B below. Analysis of Rushmoor Council’s historical data reveals that this has attracted 6 noise complaints in 6 years. It therefore appears that this route is acceptable and viable.

Nevertheless, this we have considered two further routes via LF0002 and LF003, shown in Figure 3.2B, which have attracted one and no complaints respectively, but are closer to the edge of CAS, at 1.5 nm and 0.5 nm, in turn. These are NPRs and not SIDs and so for the purposes of CAP 778 require no CAS at all. So whilst they do not “replicate” the lateral distance criterion to the edge of CAS as stated in the CAA’s Containment Policy, they are still enclosed within CAS.

We also examined the overflying of the surrounding population by these routes as well as those of TAG’s proposal. The results are as follows:

- Option 1, which routes via LF001 (magenta), overflies 4000-4500 houses,
- Option 2, which routes via LF002 (blue), overflies 2510-2560 houses,
- An additional routing that was considered, which has not been pursued further, via LF003 (green), overflies 1650-1700 houses,
- TAG’s proposal (red) overflies 1650-1700 houses.

It can therefore be concluded that both the green and TAG’s route are environmentally equivalent in this respect, that the blue Option 2 route is nearly as effective and that Option 2 is environmentally better than Option 1.

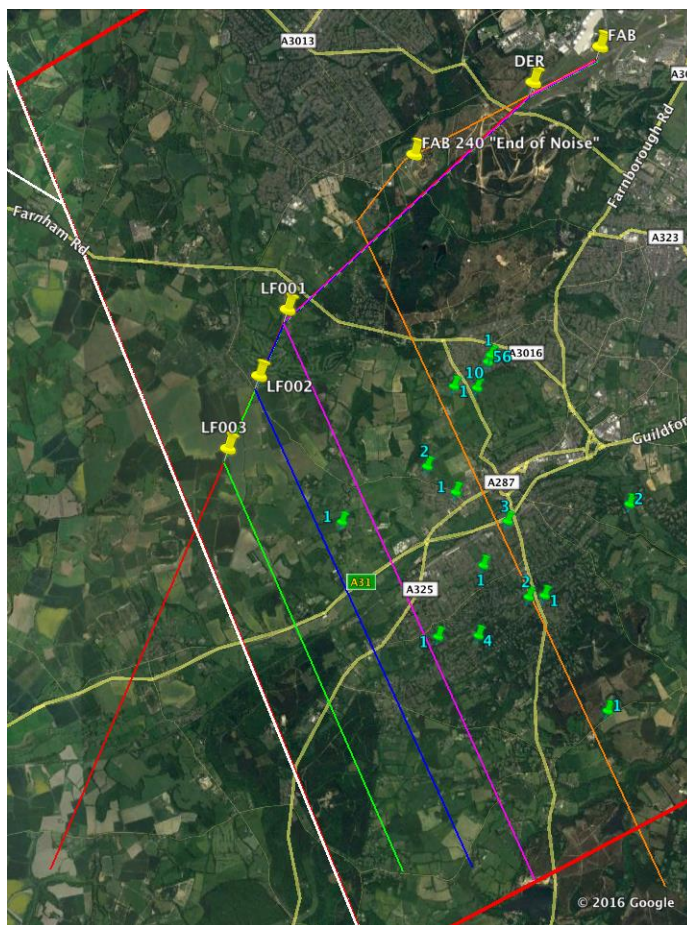


Figure 3.2B

### 3.3 Check by flight simulation – Flyability

We checked the flyability of the arrivals and departures that we proposed to ensure that the theoretical designs could be flown and were not arduous to perform. The 24 departure simulations were undertaken at 30 degrees, and with the aircraft at maximum structural weight to represent a worst case. All the simulations were successful and well within aircraft performance.

Figures 3.3A and 3.3B show example charts of the results, respectively. If required, we are more than willing to provide the technical details of the results obtained.

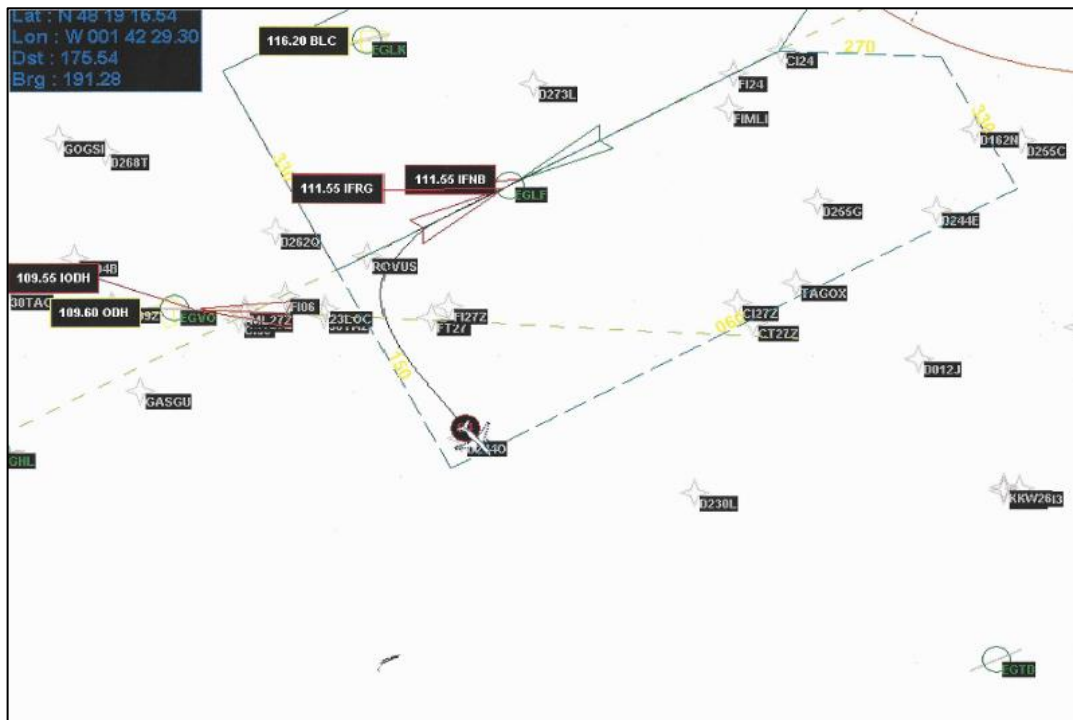


Figure 3.3A

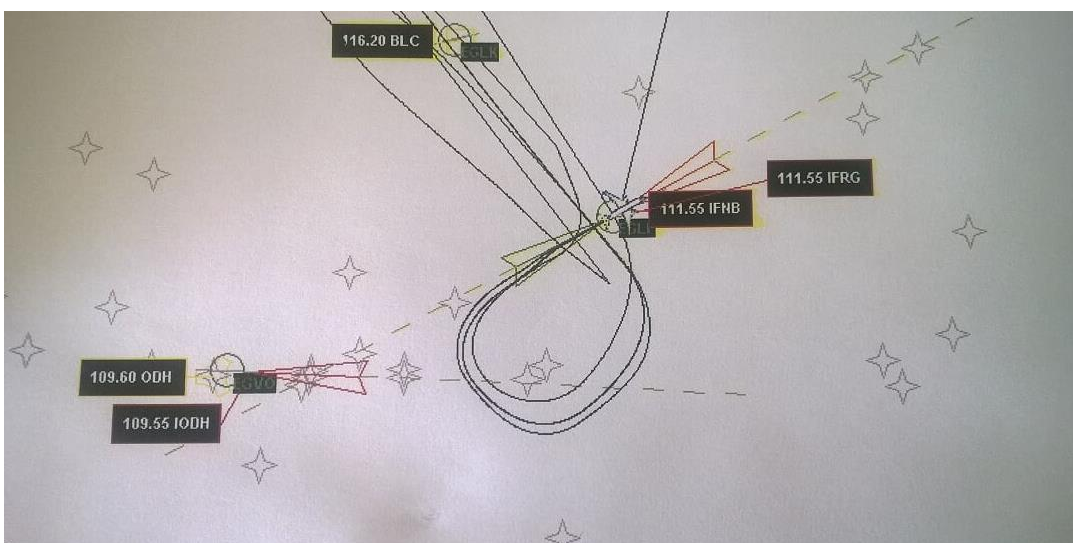


Figure 3.3B



#### 4 It satisfies the fundamental needs of the Gliding/GA organisations and pilots

At the 7th November 2016 CAA meeting, Gliding/GA was unexpectedly confronted with the question regarding what it really needed in terms of airspace, although it was self-evident that TAG's requested airspace radically removed a significant proportion of the Class G currently available and made the remaining airspace significantly less safe.

In a spirit of transparency and willingness to collaborate in the generation of a safe and proportionate solution, the following form the basic requirements in answer to the CAA's question:

- To run GA/Gliding airfield *operations* unchanged and as safely as today, taking into account both local and visiting pilots,
- To have the same *flight* safety or better for the overhead and nearby airspace covering Training, Cross-country and Competitions (TCC),
- To have safe access to airspace in which TCC can be undertaken: including destinations, en route phase and involving altitude as well as lateral extents of airspace,
- To maintain the present financial viability of airfield organisations,
- To maintain the current flexibility to unilaterally initiate or stop operations as well as undertaking or curtailing flights depending on immediate meteorological conditions,
- To recognise that some aircraft cannot be fitted with transponders because of either the unacceptably high costs of certification or the physical inability to carry such equipment and power supplies – this affects both local and en route flying,
- To recognise that extended ATC radio exchanges are much more difficult in gliders than in powered aircraft and, in the case of functioning turbo power plants, impossible.

At the 7<sup>th</sup> December meeting, because of the CAA's great insistence on this point, we have therefore provided detailed explanations of these points below that specifically include the impact of TAG's proposals.

##### 4.1. To run GA/Gliding airfield *operations* unchanged and as safely as today, taking into account both local and visiting pilots

For Lasham, the TAG proposed Option 34/36/38 airspace will introduce CAS that is very close to the airfield – only 45 seconds flying time from the airfield boundary – and over 600 ft below the altitude of a normal aerotow.

The fundamental issue is that both TAG and Lasham need to operate in their easterly runway directions when the wind direction and strength dictates this. In practice this currently works safely and satisfactorily. However, there are IMC conditions when Lasham would certainly not be using its 09 runway and TAG would want to fly full ILS approaches for its 06 runway. These appear to be:

- Runway 06 is in use i.e. the wind component on 24 is greater than 5 kts tailwind,
- Either
  - Cloud base at Farnborough is below 1000 ft aal,
  - Visibility is less than 4100 m.

There are three main concerns with safety in the area around Lasham:

- There is an increased and very real risk of collisions because the class D airspace to the east of Lasham and the reduction in the height of the airspace to the south creates a narrow corridor approximately half the size of its present extent. This will create a serious choke point with Lasham on one edge and with the area where Lasham aircraft operate situated right in the centre – especially so given the large

number of light aircraft that will divert closer to Lasham to fly around TAG's airspace,

- There is a greater risk of gliders landing out in an easterly wind because they cannot operate up-wind,
- Because of the curved track that will be required when aerotowing in an easterly direction, there will be occasions when gliders will be out of range of the airfield for part of the tow.

This will make basic training much more difficult.

Because of the reduction of the airspace to the south and elimination of flying to the east there is a reduced area available in which to operate in around Lasham. There will therefore be a significant safety issue on a busy day if pilots cannot head off quickly. In a gliding competition it is a guaranteed safety issue.

There is a high likelihood that it will prove to be too risky for air experience flights to take place for the general public and for some members. During the Olympics, a similar choke point risk was created by the temporary airspace implemented. Lasham discontinued air experience flights over the Olympic period and was commended by the CEO of the CAA for its responsible attitude. Many members chose not to fly or moved elsewhere.

For Parham, there are three major safety concerns raised by TAG's proposed airspace Options 34/36/38:

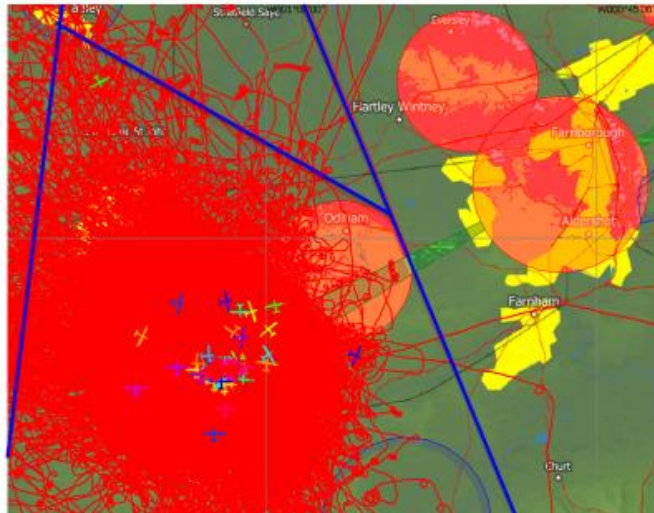
- Pilots will be unable to return in the afternoon in an uninterrupted final glide through non-convective air caused by the sea-breeze front advancing northwards during the day. This will significantly increase the risk of landing out in fields when they are unable to reach the Parham airfield. Lasham pilots have a similar problem returning in the opposite direction,
- Pilots will have a restricted area in which to climb and undertake the en route phase of flight on leaving Parham because TAG's proposed airspace provides less lateral area in which to seek out thermals and also restricts the height to which gliders can climb by 1,000 ft because of SERA 5001 legal restrictions within any form of controlled airspace. The CAA's current derogation does not assist here. Lasham pilots have a similar problem in the opposite direction,
- In flights to and from the north, Parham aircraft will have to fly through the dangerous choke point area near and above Lasham.

#### **4.2 To have the same *flight safety or better* for the overhead and nearby airspace covering Training, Cross-country and Competitions (TCC)**

For reasons that are unclear, this safety point, which is required to be scrutinised as a fundamental duty of the CAA, has never been addressed by TAG – not even in the July to December 2016 CAA meetings. The GA community is genuinely perplexed and remains highly concerned by this.

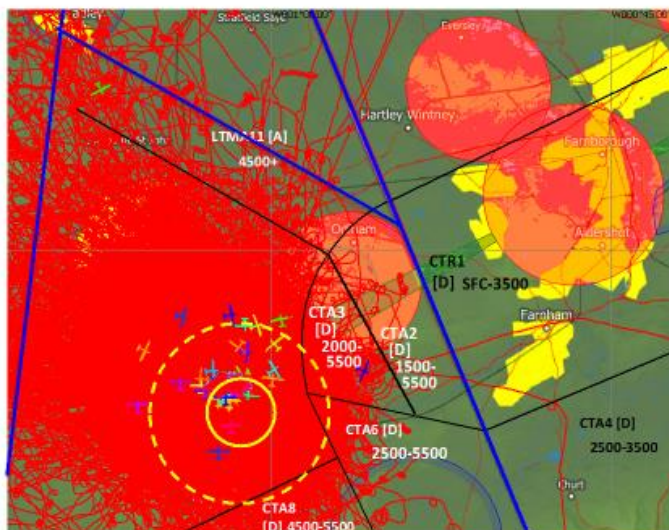
The reasons for this are once again explained below. It is one of the major drivers behind the airspace designs contained within this document, which represents a concerted effort to generate a design that is much safer as opposed to TAG's, which is unequivocally unsafe for GA, including gliding.

Figure 4.2A shows all of the Lasham *training fleet* glider tracks from 18<sup>th</sup> September 2012 to 30<sup>th</sup> September 2015 that at some point were east of 1 degree West, North of 51.2 and South of 51.4. Such movements on this chart represent some 2% of Lasham’s 64,000 annual movements. To be precise, this means that 98% of Lasham’s movements, all of which necessarily must start and finish at Lasham, are not displayed. Self-evidently, the resulting total movements would be significantly denser.



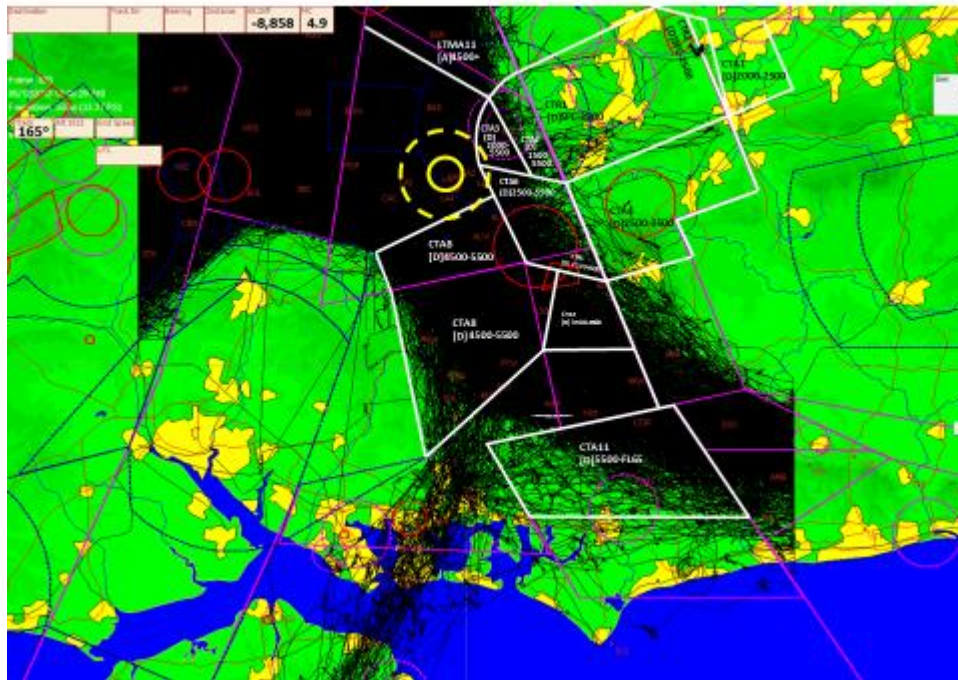
**Figure 4.2A**

The proposed airspace is sufficiently east of Lasham to avoid the safety aspects associated with these to be removed and for the obviously high risk of local airspace infringements to be eradicated (see Figure 4.2B below, which shows TAG’s Option 34 – Option 38 is identical here – airspace superimposed on Figure 4.2A above.



**Figure 4.2B**

Figure 4.2C below shows where cross-country or en-route phases of flight take place.



**Figure 4.2C**

This shows the high concentration of glider flights in the currently available Class G airspace. This concentration is repeated for GA powered aircraft.

There is an obviously busy area where aircraft travelling from north to south and from east to west are funnelled by the existing airspace.

The proposed TAG airspace would significantly remove parts of this and aircraft would route through a smaller gap, particularly overhead and near to Lasham. This is explained below and extracted from Lasham’s initial formal Consultation Response Document. In 2010, QinetiQ undertook a study into the feasibility of modelling air traffic in Class G airspace in the area between Brize, Lyneham, Salisbury Plain, Southampton, and the London TMA/Zs. Data from a survey of a wide range of aviation users was used, including glider GPS flight-log traces held in the BGA National Ladder databases. The modelling output was successfully validated against radar data for the area provided by NATS. The study was sponsored by the CAA under The Airspace Safety Initiative. A key assumption shown in this was that 70% of Light Single aircraft will avoid going through class D airspace – i.e. would route around it.

The CAA’s document, Guidance for Visual Flight Rules (VFR) in the UK, also states that, “*If you plan a route through controlled airspace, remember that a crossing clearance may not always be possible and consider that route as your ‘secondary’ plan. **Your primary plan should avoid controlled airspace** – and don’t forget to make your overall time and fuel calculations using the longer, primary route!*”

While some non-gliding traffic is expected to continue to route to the east of Lasham through the proposed new Class D, most will divert to the west. TAG’s proposed crossing service and dedicated frequency cannot be expected to stop this. It would take years of dedicated education of both controllers and pilots to change this fundamentally engrained

behaviour. Hoping that this could be achieved almost immediately or even within one year is speculative, untested and entirely unrealistic.

The overall effect will be a certain and significant increase in concentration in the corridor bounded by the western end of the proposed Farnborough Class D (i.e. at Lasham) and at Midhurst, and on the west by the Southampton airspace.

The following “tomorrow” diagram shows the expected effect on the routing around the proposed Farnborough airspace. The dashed red lines, together with the adjacent shaded pink areas are to identify and highlight the limits of the practically usable Class G airspace for most traffic.

In the “tomorrow” diagram (using the Option 38 airspace), Figure **4.2D** comprises the following:

- The solid blue arrows show how most of the traffic will be diverted to the west of the Farnborough Class D and concentrated into a gap between Farnborough and Southampton airspace (which is approximately 36% of the size it was before).
- The dashed blue arrows represent an additional small proportion of GA traffic which may choose (and subject to clearance from Farnborough ATC, be permitted) to route through the new Class D,
- Gliding traffic will be substantially displaced to the west into the remaining narrow corridor with airspace not lower than 4,000 feet AMSL. This is because it is difficult and slow for gliders to make progress securely below about 2,000 to 2,500 feet (depending on the height of terrain) because thermal search ranges are small and the probability of off-airfield landings becomes unacceptably high.

# Available airspace & traffic flows tomorrow



**Figure 4.2D**

GA aircraft routing around the Class D in the airspace near Lasham will naturally choose to fly at the lowest en-route airspace under which they have to fly. This complexity will drive aircraft down towards Lasham circuit patterns.

A further analysis, similar to that undertaken for the imposed Olympic airspace reveals the factor by which the conflict probability for GA aircraft will be changed in the remaining Class G in this region by the presence of both other aircraft and gliders. **For GA traffic routing through the Lasham area which would previously have been able to route elsewhere, the conflict rate will be of the order of 10 times greater.** Since the usable part of the Lasham choke point in the Farnborough proposal is almost the same width as and almost exactly aligned with the densest area of the Lasham glider operating area, transiting traffic will not be able to avoid this multiplier effect. **This will generate a major decrease in safety.**

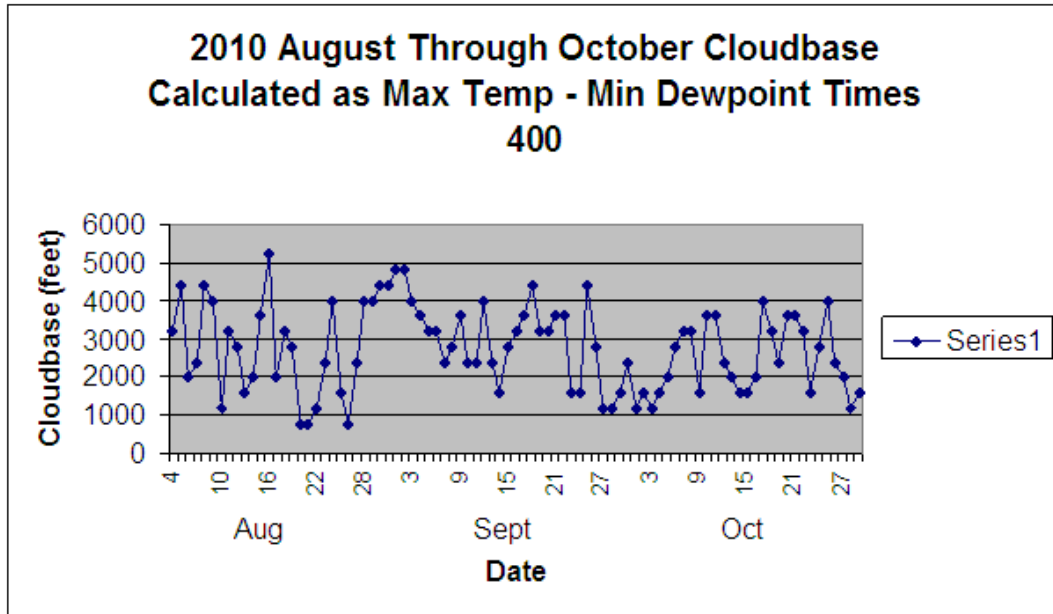
We would submit that this outcome from TAG Farnborough's airspace change proposal is entirely unacceptable.

**4.3 To have safe access to airspace in which TCC can be undertaken: including destinations, en route phase and involving altitude as well as lateral extents of airspace**

As well as being able to proceed through the available Class G airspace, gliders in particular need to be able to ascend to a sufficiently height above the ground in a thermal to be able to proceed en route to "top up" at a subsequent thermal. Once gliders are about 2,000 ft agl, they need to begin to identify areas where landing in a field might be a precautionary outcome. At 1500 ft agl, they are obliged to start selecting particular possible fields. The outcome of this is that a height of 3,000 ft agl is the generally desirable point at which flying across country becomes practicable. Obviously being higher than this is necessary in order for en route flying to proceed safely and efficiently. In this context, the higher the cloudbase the better – gliders are permitted to fly up to cloudbase (we noted TAG's assertion that this is not so. TAG is incorrect in law (see Commission Regulation 245/2014: FCL.600 IR General, FCL.830 Sailplane Cloud Flying Rating and SERA.5001).

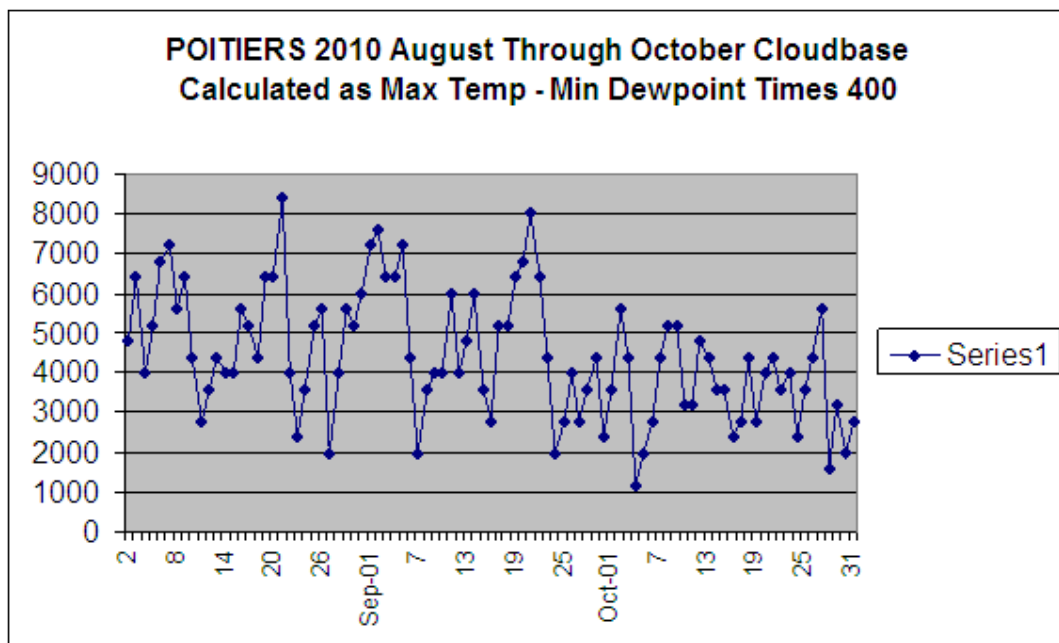
In this context, there are severe limitations imposed by controlled airspace. This is an important design criterion.

It may be thought that requesting permission to transit Class D or even Class E airspace would be the only potential barrier to traversing CAS in the same way as Class G. This would be a wrong conclusion. Apart from the well-known difficulty in maintaining accurate flight coupled with the consequence of the significant extra workload involved in dialoguing with controllers, there is an additional substantial problem to penetrating this airspace that is caused by legal constraints. Current legislation applicable in the UK in the form of SERA 5001 states that in CAS, under VFR conditions and above 3,000 ft amsl, all aircraft including gliders must remain clear of cloud by 1,000 ft vertically and 1,500 metres horizontally. There is no UK-specific modifying derogation, temporary or otherwise, for this. By way of example, Option 36's CTA7 is proposed to be between 3,500 ft and 4,500 amsl. Under SERA, gliders could not enter this airspace at all unless the cloudbase was 4,500 ft amsl or higher. They could not fly to the top of this airspace unless the cloudbase was 5,500 ft amsl or higher. This same restriction applies to all aircraft flying VFR. When SERA was in its consultative stage, data was supplied by Lasham to contrast southern UK cloudbase conditions with a Continental European site – Poitiers was selected for the latter. The following two charts (with apologies for their quality), produced at the time show the cloudbases between August and October 2010, these reflecting the wide range of conditions that occur during the year. The first Figure **4.3A** below shows the cloudbase at Odiham.



**Figure 4.3A**

By contrast, the second Figure **4.3B** below, reproduced for interest, shows the cloudbase at Poitiers for the same period and illustrates that in such areas of Continental Europe, this legal constraint would have significantly less impact.



**Figure 4.3B**



It can be seen from the UK data that there was only one occasion when the airspace corresponding to the entire CTA7 could be accessed and only approximately 9% of days when it could be entered at all.

In conclusion, not only does the airspace have to be sufficiently wide in a particular area to remove the danger of choke-point funnelling, for gliding it must be reliably accessible to at least 4,000 ft agl to permit efficient en route flying. As explained above CAS, removes 1000 ft at a stroke from this and, paradoxically, reduces safety.

#### **4.4 To maintain the present financial viability of airfield organisations**

It is self-evident but worth stating that no airfield organisation should have to suffer a financial penalty that impacts in any way its viability because airspace has been inflicted upon it by an ACP that is almost entirely driven by the proposer's desire to increase or even simply maintain its own its own financial position at another airfield's expense.

Airfields such as Parham, Lasham and Goodwood, for example, are fundamentally commercial organisations. They have an equal right and a requirement to be able to continue to operate in a financially unimpaired way.

In Parham's specific case, TAG's proposals essentially bring to an end cross-country flying from its airfield and will impact the organisation's finances to such an extent that it will almost certainly bring about its rapid demise.

In Lasham's case, longstanding aviation operations at the largest gliding aviation centre in the world with an internationally recognised reputation for training, competitions, a Heritage Centre and young persons' aviation, will be severely and critically curtailed and may well become unviable, leading to an overall loss of employment amounting to several hundred jobs in the area.

#### **4.5 To maintain the current flexibility to unilaterally initiate or stop operations as well as undertaking or curtailing flights depending on immediate meteorological conditions**

GA and gliding movements in particular can be initiated or curtailed by rapid changes in weather. This means that the operations for launching and recovering aircraft can suddenly swing into action – or the reverse – when, for example a weather trough suddenly passes through. This flexibility is fundamental to pilots wishing to depart or return and to the consequent financial results of the airfield operations supporting them.

The notion of having protocols or permission arrangements controlled by another airfield that are initiated hours or days in advance, or withdrawn unilaterally, is simply impractical in this context.

#### **4.6 To recognise that some aircraft cannot be fitted with transponders because of either the unacceptably high costs of certification or the physical inability to carry such equipment and power supplies – this affects both local and en route flying**

CS-STAN CS-SC002a applies to the installation of transponders in EASA sailplanes and certain other categories of aircraft where not in conflict with type certificate holder data. Required functional hazard assessments can result in the need to recertify aircraft to demonstrate safe function when modified with a transponder and associated power supply. Installation/modification and ongoing maintenance costs are very high and normally beyond the ability of a sporting and recreational pilot or club owner.

Some aircraft, particularly those in the Annex 2 category, although shielded from the above costs, simply do not have the panel or power supply space to enable the carriage of such equipment. Most, but not all, typically tend to fly locally to their airfields.

#### **4.7 To recognise that extended ATC radio exchanges are much more difficult in gliders than in powered aircraft and, in the case of functioning turbo power plants, impossible**

Air traffic controllers frequently react with scepticism that the act of asking for permission to transit or penetrate controlled airspace can possibly be difficult in any way, providing that the pilot has been properly trained in radio communications.

Unfortunately, this is not so. Unlike a powered aircraft progressing steadily under its own power, a glider has either to circle in a thermal of rising air or proceed in air that is not sinking to the next thermal. The pilot is constantly adjusting the flight controls using both stick and rudder as well as frequently adjusting the flap settings, where fitted – at the same time as monitoring the rate of rising or sinking air and navigating. This produces quite a high workload. Adding radio communications to this can frequently lead to overload and lead to a significantly increased risk of inaccurate flight and navigation (the analogy of using a mobile phone in a car is a valid but significant understatement). This is not theoretical. Commercial air transport pilots who fly gliders regularly point this out. Even those glider pilots who teach R/T make the same observation. The result is that if a pilot can avoid an extensive R/T interchange with a controller, he or she will.

In the case of a turbo power plant being operated, radio communications become impossible. Gliders use microphones and loudspeakers instead of head-sets. Ear defenders have to be worn when a turbo is running to avoid damage to hearing. Transiting controlled airspace with a running turbo whilst speaking to a controller is not generally possible.

## RESPONSE TO DOCUMENT SENT TO THE SOUTHDOWN GLIDING CLUB BY [REDACTED] ON 14TH DECEMBER 2016

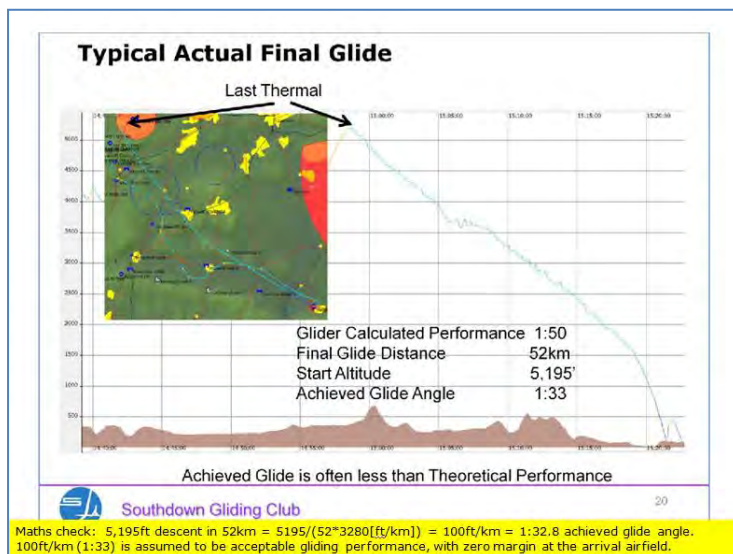
The plan view that was requested and was sent by [REDACTED] on the 14th December, forms parts of Option 39 and is consistent with the December 2016 Airspace change submission to the CAA by TAG.

In the letter sent by [REDACTED], he seems to claim that a very minor change to the Option 36 design will make it possible for Southdown Gliders to return home after inland cross-countries.

Unfortunately, **THIS IS NOT THE CASE** and the Southdown Gliding Club (SGC) would like to be very clear that the Option 39 design continues to have devastating consequences on the club and its future.

The following paragraphs explain the reasons for this and highlights shortcomings in the latest TAG proposal. Options of a less disruptive solution are discussed as a win-win solution for all parties.

### 1. The Final Glide Case



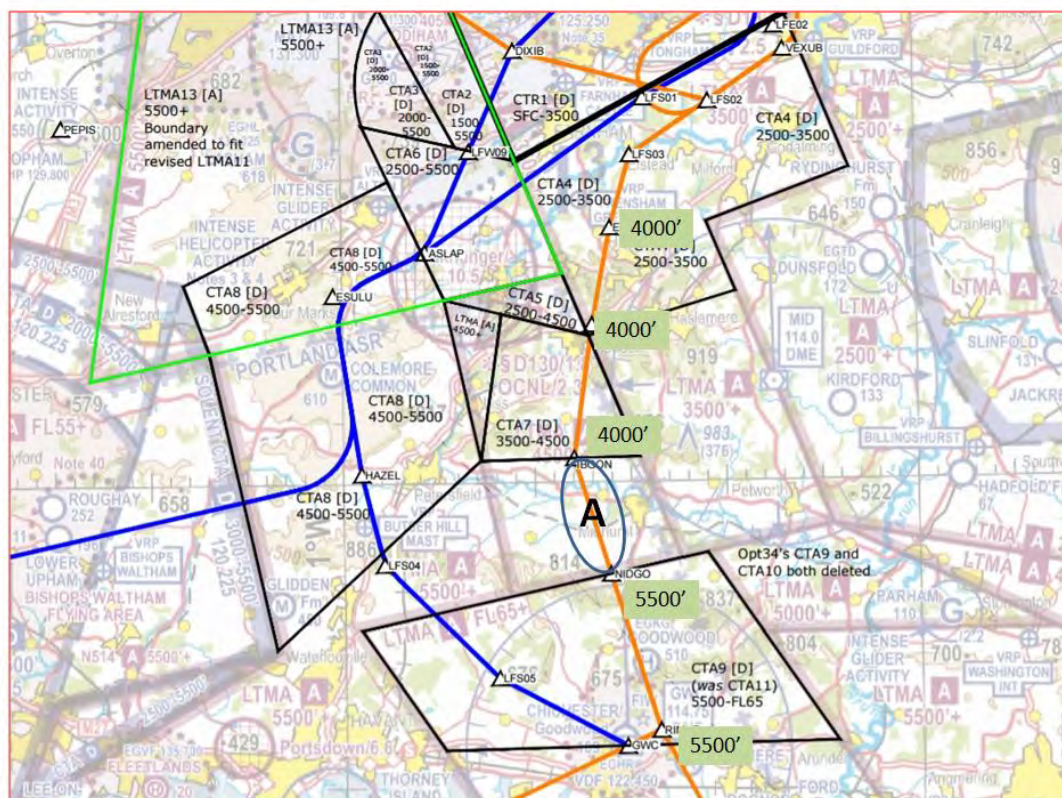
TAG have taken the above slide out of context and have attempted to use this to demonstrate that in perfect conditions, it might just be possible to glide back to Southdown Gliding Club through still air. The context of this slide was different (as was explained in the face-to-face meetings) as it was **created to show that gliding home through sea air would result in a much worse glide performance than the calculated performance** (due to sea air headwind, sinking air after crossing the front and accumulated 'bug' debris on the wings).

In practice the vast majority of our cross country gliders based at Parham have a much worse calculated glider performance than 1:50.

So to summarise the issue of the Final Glide and the use of this slide by TAG :-

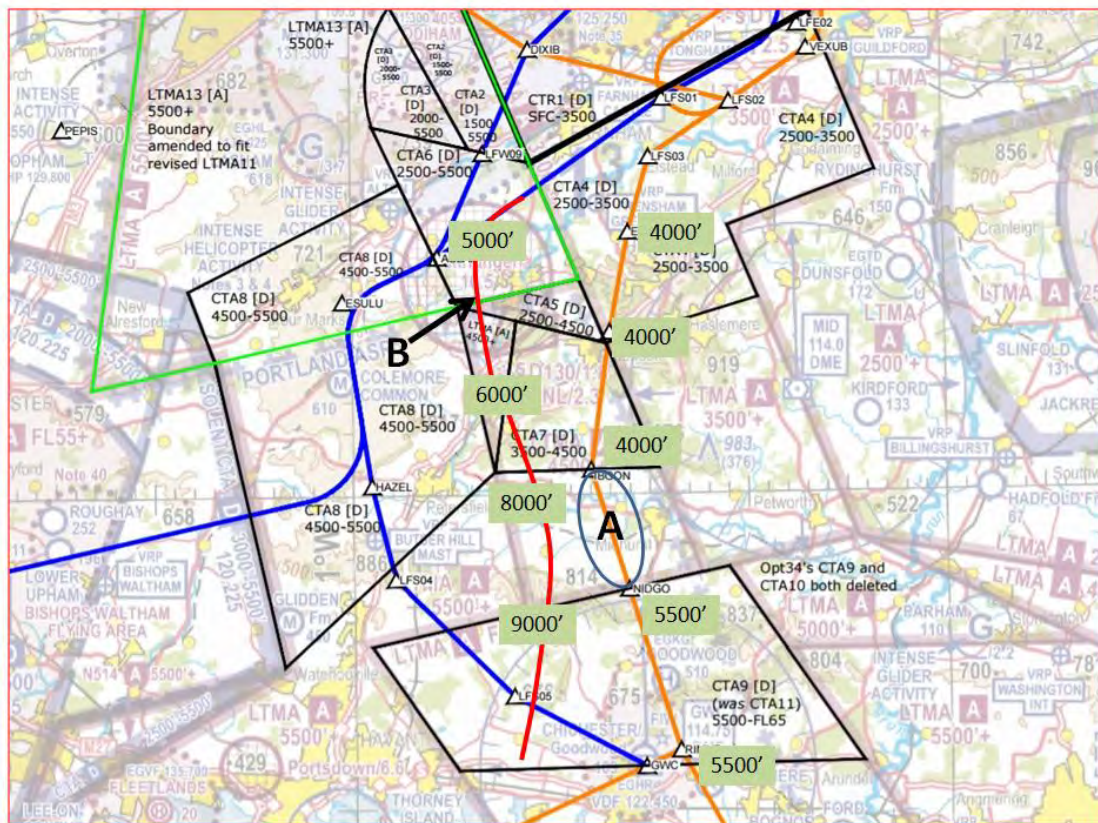
- The slide was created to illustrate the degradation of theoretical glide performance .vs. actual.... Not to illustrate typical absolute glide performance.
- It is based on a 50:1 glide angle (most Parham glider performances are worse than this)
- Whilst today the vast majority of gliders are able to final-glide to Parham most of the time, the Option 39 airspace will mean that the vast majority of the gliders will be forced to land in fields short of the airfield most of the time. It is not reasonable to be impose this upon on an established flying community, where other sensible alternatives exist.

## 2. SGC Observations regarding the Option 39 design.



- The design creates large areas low altitude airspace underneath existing LTMA which forces arrivals from the south to descend *much earlier* than normal and fly very inefficient paths not consistent with CDO or CAA FAS.
- Noise levels on the ground will be much higher than occur during typical arrivals over the last decade which are much higher and ARE consistent with CDO & FAS
- TAG have expressed their desire to have their 'OWN' airspace to avoid the need to liaise with Gatwick, however, arrivals from the South are unable to transit from NIDGO to IBGON **without first liaising with Gatwick** as aircraft must **pass through Gatwick Departures** in the area labelled **A** in the above chart.
- Once the precedent of necessary liaison with Gatwick to penetrate the Gatwick departures is established, this gives opportunities for a much better and less disruptive airspace design.

### 3. SGC's views of A Better Way for All



The 'better way' originates from what arrivals from the South have been doing for decades. Liaison with Gatwick departures is needed, but as can be seen above, this is **necessary anyway**.

- The RED line shows typical ACTUAL flight arrival data into Farnborough.
- Re-consultation on this would not be needed as this is exactly what TAG have been doing for many years
- No additional controlled airspace is required until the aircraft emerge from the Northern edge of Gatwick Departures at Point 'B'.
- From this point onwards, the Revised design proposed by the GA community (20th Dec 2016) would ensure that the traffic remained in a known environment giving the functional efficiency improvements that TAG have continued to state as being their key driver for this airspace change.
- In addition, the profile of the RED line is consistent with both CDO and the CAA FAS and would generate much less noise for all, so has major environmental benefits.

### In Conclusion

From an early stage and in every consultation response, the Southdown Gliding Club have acknowledged the issues that TAG face and have supported the introduction of *some* controlled airspace in the vicinity of Farnborough to address these. This document, specific to the Southdown Gliding club final-glide case only adds weight to the GA community Revised airspace design, and which has the full support of the Southdown Gliding Club.

Dec 27, 2016.



2<sup>nd</sup> January 2017

[REDACTED]  
[REDACTED]  
Civil Aviation Authority  
CAA House  
45 - 49 Kingsway  
London  
WC2B 6TE

Dear [REDACTED],

## **TAG FARNBOROUGH Airspace Change Proposal(s)**

We write to you on behalf of the entire general aviation community because of the overwhelming importance to us of the forthcoming decision on the TAG Farnborough ACP.

Whilst we are unsighted on the detail of TAG's latest proposal, we expect the basic airspace design, together with the supporting rationale, to be little different from that previously published for consultation. As a consequence, we believe that the fundamental issues that we have shown to exist with TAG's proposals since the outset will be unchanged. These would, if implemented, give rise to extremely serious consequences for the safety and operational viability of a large volume of general aviation activity over a significant geographic area. We must, therefore, ensure that you are in no doubt of the concerns of our members and the strength of our resolve to oppose TAG's application in its current form.

Airspace is a critically scarce national resource. The decision to re-allocate or re-classify airspace in such a way that changes the balance of priority over a given volume of airspace in favour of certain users and away from others, must only be taken after the most rigorous scrutiny of the case for change, and the consequential impact on parties other than the primary beneficiary. The GA community has invested significantly in understanding both TAG's rationale for its proposals, and the impact that these give rise to on other airspace users. We have done so in the most rigorous and evidence-based way, and have concluded that, in summary:

- ***There is absolutely no case for change along the lines proposed by TAG***

There are no commercial air transport considerations at play here, and TAG has clearly and repeatedly stated that there are no safety-related requirements related to their ACP. In addition, it has also stated that controlled airspace is not needed to enable future growth in Farnborough traffic.

TAG's sole reason for requiring controlled airspace is to enable it to manage its inbound and outbound movements in such a way as to minimise delays to its traffic. What is meant by 'delay' in this context is far from clear – particularly given the fact that Farnborough aircraft are not scheduled and that a large proportion of movements are positioning flights with crew only on-board. Such data as TAG has been prepared to share with us on this subject clearly shows that what are counted as 'delays' actually happen infrequently, and the extra time required for an in-bound or out-bound movement amounts to no more than a few minutes - far from a compelling justification for vast swathes of controlled airspace. Indeed, the application beggars belief.

Any argument becomes weaker still when it is recognised that Farnborough traffic amounts to no more than 10% of total movements at airfields in the area.

- ***TAG have given no consideration whatsoever to the very real safety consequences that its airspace design will create***

The Class G airspace from Oxford to the south coast, west of London, is among the busiest in the country. Traffic density and conflict risk levels in the area have been analysed in detail, especially in the area between Odiham/Lasham and Southampton. Such work has been undertaken not only in connection with this ACP, but also for previous studies associated with the 2012 Olympics and following the Benson collision.

Our analysis clearly shows the significant increase in conflict risk that would occur were TAG's proposals to be implemented. These calculations have been carried out on the basis of current traffic levels in the area – and have not made any assumption about increases in traffic levels that would occur as a result of transit traffic electing to re-route to the west around TAG's controlled airspace. We have been deliberately prudent on this point – despite the fact that separate analysis of traffic patterns following the introduction of controlled airspace consistently show that the majority of traffic would re-route rather than seek a crossing service.

Despite raising our safety-related concerns with TAG time and time again, it has consistently refused to acknowledge the importance of taking such potential increased risk in the vicinity of the westerly 'choke point' into account, nor has it conducted any independent analysis of its own. We consider this attitude – tantamount to a gross lack of concern for other aviation stakeholders – to be bordering on the negligent.

- ***There are far better ways to create an increased 'known traffic environment' in the vicinity of Farnborough airfield that meets the needs of all airspace users in a workable and practical way***

The GA community understands the importance of ensuring appropriate interoperability between different airspace users, especially in congested areas. We actively participate in a range of CAA-sponsored programmes to explore new forms of conspicuity-related technology, and are well-used to developing and agreeing the use of various airspace sharing mechanisms (e.g. surveillance areas, LOAs, etc.).

Throughout this entire process, however, TAG have repeatedly rejected any proposals put forward by the GA community that involved means for increasing levels of known traffic in an area. It has been completely intransigent and steadfastly refused to move from its position of demanding an enormous volume of controlled airspace primarily for its own benefit.

The GA community has invested significant amounts of its own resources to analyse TAG's actual flight patterns, consider the needs and safety of all users, and develop what we believe to be the basis of a sound and responsible airspace construct for use in the vicinity of Farnborough. This has been shared with TAG, and has also been sent to the CAA. The proposal is by its nature lengthy and detailed, and was sent to [REDACTED] on 20<sup>th</sup> December.

In simple summary, it proposes controlled airspace immediately surrounding Farnborough itself where TAG traffic would predominate, provides for more than 98% of TAG flights to be contained within controlled airspace, continues to leave airspace further from Farnborough accessible to other aviation who predominate in those areas, and in so doing removes the dangers of choke points.

We believe it to be the most practical way of increasing known traffic in the vicinity of Farnborough without fundamentally undermining GA in the area.

The above points provide a high-level summary of the issues of greatest concern in TAG's proposals to the GA community. We have a library of data and detail behind each and remain willing to share the full workings of our efforts with the CAA.

It was no surprise that TAG's consultations received unprecedented numbers of objections from aviation stakeholders. What is surprising and shocking is that after such feedback successive evolutions of their proposals have not only disregarded the operational impact on GA but appear to have wantonly ignored the obligation to assess and adapt proposals in the interests of the needs and safety of all airspace users.

We fully appreciate the challenge that the CAA now faces. It is vital that TAG's proposals are subjected to the highest possible level of rigorous, quantitative and objective scrutiny. On that basis it is our belief that the proposals should simply be refused. If the CAA should be minded to introduce any controlled airspace in the vicinity of Farnborough, we urge you to consider the GA proposal as the basis on its own merits.

We remain at your disposal and offer whatever help and support you may require.

Yours sincerely,

[REDACTED]

[REDACTED]  
[REDACTED]

Royal Aero Club of the United Kingdom

[REDACTED]

[REDACTED]  
[REDACTED]

General Aviation Alliance

[REDACTED]

[REDACTED]  
[REDACTED]

British Gliding Association

Cc: [REDACTED] CAA

Annex H

## UK's work on Conspicuity

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### Background

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#### ELECTRONIC CONSPICUITY

The CAA is working towards recognition of the need for widespread uptake of a broadly universal Electronic Conspicuity device by the General Aviation (GA) community within the UK FIR. For reasons of interoperability, simplicity and cost, the CAA favours the technology known as ADS-B (Automatic Dependent Surveillance – Broadcast).

ADS-B differs from the conventional methods of surveillance (Mode S or Primary Radar) which rely on an expensive ground infrastructure to interrogate an aircraft to build a surveillance picture. ADS-B allows the aircraft to determine its own position (via GPS) then broadcast that information so that other aircraft in its vicinity, and receiving stations on the ground, can build up a known air picture (aka – improved situational awareness).

For larger (more complex) aircraft, the technology is at an advanced level of maturity and subject to the usual international aviation standard for its build, installation and use. When exploring a suitable solution for the GA fleet, it is possible to scale down the full capability for ADS-B to develop a subset of requirements that are less costly, but still provide a proportionate level of functionality that is required for the lesser task. A key positive outcome of following this methodology is that it offers interoperability with existing systems as it uses a common broadcast frequency (1090mHz).

In the short-term, a low powered/low cost ADS-B offers a proportionate aid to reducing the incidences of mid-air collision (MAC); in the longer term, the benefits of ADS-B and its interoperability include the ability to integrate commercial, military, GA and unmanned traffic into the same situational awareness picture.



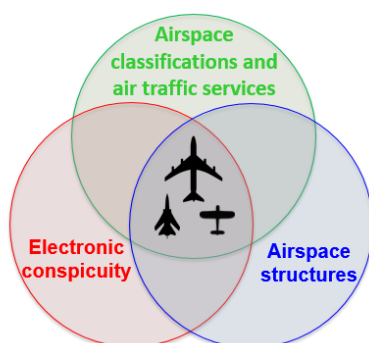
As the primary aim of increased conspicuity at this time is to reduce the incidence of mid-air collisions, the most immediate effect of such an equipage aim should be sought through 'an inkblot mentality'; through the identification of known 'hotspots' for GA traffic operations. The ongoing trials and development work parented by the CAA aligns its output with the work of the Airprox Board – identifying choke points and high traffic intensity sights that bring greater volumes of GA traffic together, with a commensurate increased likelihood of catastrophic events, to highlight those 'inkblot' starting points.

It is the intention of the CAA to encourage uptake via the identification of the benefits associated with equipage – such as enhancing lookout to bring to the attention of the pilot other aircraft within the immediate proximity carrying such devices; and, providing additional information services (such as live weather data feeds) into the cockpit to improve the situational awareness facilitating generically improved decision-making by the GA community. As the concept of 'see, be seen and avoid' relies on greater conspicuity (both visual and electronic) of ALL airborne vehicles in a defined volume of airspace, the initial 'voluntary carriage' methodology could move relatively quickly towards compulsion – through mandating of carriage in these clearly defined blocks of high density/high risk airspace identified in the CAAs work with the Airprox Board.

When assessing potential solutions for MAC we acknowledge other issues that can be addressed by electronic conspicuity and how the choice of technology quickly becomes essential to wider issues faced in the UK. Two of these challenges come in the form of the need for airspace modernisation to facilitate new market entrants and user requirements, and the changes we will need to deliver to Air Traffic Services (ATS) with the introduction of the Air Traffic Management Implementing Rule (ATM IR), specifically the part relating to Air Traffic Services (Part ATS). The current ethos to airspace construction and operation system (segregation, not integration) limits options for the Flexible Use of Airspace (FUA) – a key concept in future development within the UK. Often airspace is categorised in a way that prohibits use to others although that airspace is not being entirely efficiently utilised for its intended purpose. It can be prohibitive to new technologies – when a new technology wishes to enter the airspace, it creates new problems for existing users and sets barriers to that new technology; the behaviour of the new technology (such as drones or space vehicles)

can be contrary to that of regular users and therefore, unless addressed now, has the potential to create further segregation parameters and complexity.

It is widely acknowledged that electronic conspicuity will act as a key enabler to both of these challenges. It is therefore essential that we act to equip the GA fleet with an interoperable solution to facilitate the safety benefits simplified airspace structures and ATS services can deliver. The Venn diagram below shows, in graphical form, the interaction required between technology, airspace design and the services available to all.



**You can't have one without the others – you need all three complementing each other to achieve sustainable airspace and ATS arrangements**

Annex I

## Access Arrangements open to all

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**TAG Farnborough Airport Limited**  
Farnborough Airport  
Hampshire  
GU14 6XA

Tel: +44 1252 379000  
Fax: +44 1252 379051  
[www.tagfarnborough.com](http://www.tagfarnborough.com)



4 September 2017

Airspace Regulator (Coordination)  
Civil Aviation Authority  
CAA House K601  
45-59 Kingsway  
London  
WC2B 6TE

Dear

Thank you for your letter dated 25 August 2017 regarding access arrangements to the proposed Class D CTAs.

TAG Farnborough is happy to summarise the CTA access arrangements from the ACP, as requested;

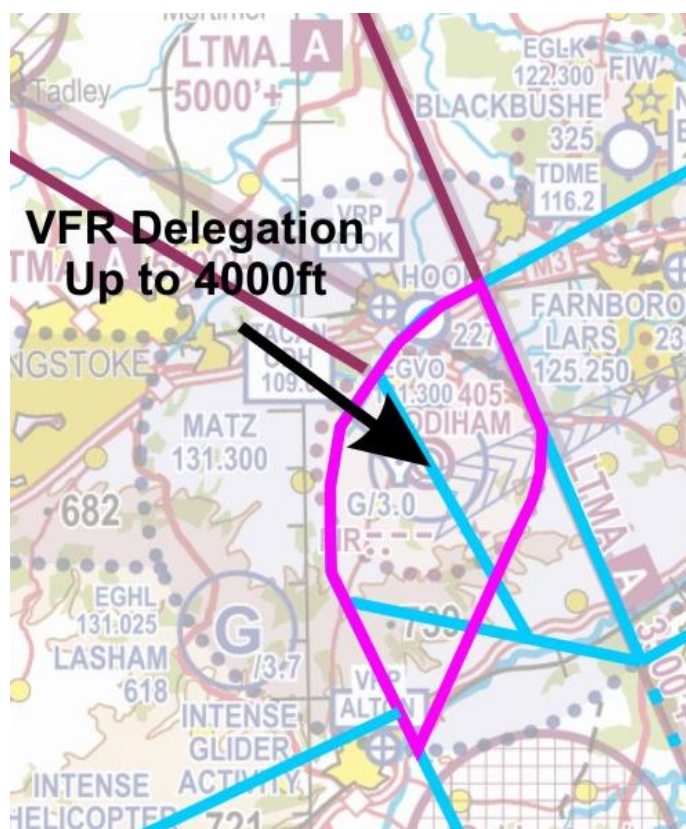
- CTA 1: Access to CTA 1 will be afforded by means of ATC clearance issued by Farnborough ATC via RTF.\*

East / West VFR transits are expected in this area and our ability to service the request was simulated on 3 occasions, each of which was subject to CAA oversight. The base of CTA 1 has been vertically defined in order to facilitate Fairoaks inbound and outbound traffic without requirement for a clearance. This element of the design has been derived with input from Fairoaks ATSU.

- CTA 2 and 3: Access to CTA 2/3 will be afforded by means of ATC clearance issued by Farnborough ATC via RTF.\*

CTA 2 and 3 both encompass certain elements of the existing RAF Odiham operation. To enable the Odiham and Farnborough ATC operations to integrate effectively, Letter of Agreement (LoA) measures have been agreed in draft, and the procedures have been simulated successfully.

Additional airspace sharing can be provided by replicating the current arrangement agreed with Kestrel Gliding Club. This current arrangement has identified an area “The Eye”, hi-lighted in pink below, within which light aircraft and gliding operations take place concurrent with Farnborough operations. This arrangement also takes place without RTF contact with Farnborough ATC.



A draft LoA for ACP implementation has been agreed in principle with RAF Odiham and Kestrel Gliding Club which replicates the current arrangement.

This area could provide additional airspace sharing arrangements subject to agreement with RAF Odiham and Kestrel Gliding Club

- CTA 4, 5 and 6: Access to CTA 4, 5 and 6 will be afforded by means of ATC clearance issued by Farnborough ATC via RTF.\* It should be noted that part of CTA 6 is encompassed by "The Eye".
- CTA 7 and 8: Access to CTA 7 and 8 will be afforded by means of ATC clearance issued by Farnborough ATC via RTF.\*

Greater airspace sharing arrangements could be available to GA users who enter into an agreement within which, at times of the day which are more critical to their operation, tactical amendments can be made to the inbound and outbound procedures. There is a potential workload impact

for ATC in the amendment of the procedures, however for agreed periods of the day this can be managed tactically. The tactical amendments to inbound and outbound procedures would remain within the consulted-upon flow swathes. The periods can be flexible on a daily basis in order to best meet the requirements of both parties. This access can be further enhanced with aircraft surveillance equipment, currently transponder but in the future ADS-B could also provide a benefit.

- CTA 9: Access to CTA 9 will be afforded by means of ATC clearance issued by Farnborough ATC via RTF.\*

*(\* - There may be occasions when clearance is issued by another ATSU on behalf of Farnborough ATC)*

TAG Farnborough remains committed to providing access to airspace users and to holding discussions over any new proposals with other parties where we could both benefit from the practical application of airspace sharing agreements, aligned with the submitted consultation.

The series of meetings requested and hosted by the CAA in the second half of 2016 did produce new information from Southdown Gliding Club which TAG continues to seek clarification on but any further information has not been forthcoming. Unfortunately, all other information presented at the meetings by members of the GA community did not offer the opportunity for TAG to refine its submission as this information been previously rejected as a consultation submission.

I trust this letter satisfies the CAA's final query for our Airspace Change and I would like to request a CAA decision timeline to be provided as soon as possible.

Yours sincerely

██████████

████████████████████

## Annex J

## Glossary

A	ACAS	Airbourne Collision Avoidance System
	ACP	Airspace change process
	ADS-B	Automatic dependent surveillance - Broadcast
	AIP	Aeronautical Information Publication
	AMSL	Above mean sea level
	ANO	Air Navigation Order
	ANSP	Air Navigation Service Provider
	AONB	Area of Outstanding Beauty
	APD	Approved Procedure Designer
	ATC	Air Traffic Control
	ATM	Air Traffic Management
	ATS	Air Traffic Service
C	CAA	Civil Aviation Authority
	CAS	Controlled airspace
	Class D Airspace	Class D airspace is for IFR and VFR use. An ATC clearance is needed and compliance with ATC instructions is mandatory. Control areas around aerodromes are typically class D and a speed limit of 250 knots applies if the aircraft is below FL 100 (10,000 feet).
	Class E Airspace	Class E airspace is for IFR and VFR use. IFR aircraft require ATC clearance and compliance with ATC instructions is mandatory for separation purposes. VFR

		traffic does not require clearance to enter class E airspace but must comply with ATC instructions.
	Class G Airspace	Class G airspace is for IFR and VFR use. No ATC clearance is required to fly and pilots can fly aircraft where and when they choose, providing they follow aviation legislation and there are no other restrictions.
	CONOPS	Concept of Operations
	CTA	Control Area
	CTR	Control Zone
D	dB	Decibel units
	dBA	Decibel units measured on an A-weighted scale
	DfT	Department for Transport
	DER	Departure end of runway
E	EASA	European Aviation Safety Agency
	EGLF	ICAO code for Farnborough Airport
	ERCD	Environmental Research and Consultancy Department
F	FASVIG	Future Airspace Strategy VFR Implementation Group
	FMS	Flight management system
	FWB	Framework Briefing
G	GA	General Aviation
I	ICAO	International Civil Aviation Organisation
	IFP	Instrument flight procedure
	IFR	Instrument flight rules
	ILS	Instrument landing system
L	Leq	Equivalent continuous sound level
	LGS	Lasham Gliding Society
	LoA	Local operating agreement



	LTMA	London Terminal Control Area
N	NADP	Noise abatement departure procedures
	NATMAC	National Air Traffic Management Advisory Committee
	NPR	Noise preferential route
	NMS or nms	Nautical miles
P	PANS OPS	Procedures for air navigation services operations
	PBN	Performance-based navigation
	PIR	Post implementation review
R	RAF	Royal Air Force
	RNAV	Area Navigation
	RNP	Required navigation performance
	R/T	Radio telephony
S	SARG	Safety and Airspace Regulation Group (CAA)
	SDGC	Southdown Gliding Club
	SEL	Sound exposure level
	SID	Standard instrument departure
	STAR	Standard terminal arrival route
T	TC	Terminal Control - NATS ATC Unit
	TMZ	Transponder Mandatory Zone
V	VFR	Visual Flight Rules