Ministry of Defence

Headquarters Air Command

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ACP-2019-18 AIRSPACE DESIGN OPTIONS – STAKEHOLDER ENGAGEMENT

1 Introduction

1.1 This document forms part of the airspace change process as defined in Civil Airspace Publication (CAP)1616. ACP-2019-18[1] was commenced in 2019 to enable the operation of a large Remotely Piloted Air System (RPAS), Protector RG Mk1, from its main operating base when it comes into service at Royal Air Force (RAF) Waddington from the early-2020s. This requirement remains in place. The Change Sponsor for this ACP is the Ministry of Defence (MOD). There is an emerging requirement for the RAF Aerobatic Team (RAFAT), to be able to access airspace over RAF Waddington to conduct flying display activity from late 2023. The MOD feels that the best way to manage this new requirement is to combine both the Protector and RAFAT requirements within one airspace change. The Change Sponsor for ACP-2019-18 has consulted with the Civil Aviation Authority (CAA) on how best to manage this; this letter will detail the agreed way ahead.

2 Initial Scope of ACP

Protector has a 79ft wingspan and is 38ft long. It is powered by a single TPE 331-10 turbo-prop engine and will be certified to fly in UK airspace. The aircraft will be operated by fully qualified and instrument-rated RAF pilots.

2.1 UK military aviation is regulated by the Military Aviation Authority (MAA). Accordingly the Protector programme is subject to the MAA Regulatory Publications (MRP). Of particular relevance to the operation of Protector in UK airspace is MAA Regulatory Article (RA) 2320 – MAA regulation for operation of military RPAS. The RA states the criteria for beyond visual line of sight (BVLOS) RPAS operation such that within UK airspace, BVLOS operations should:

[1] Each airspace change proposal (ACP) has a unique identifier allocated by the CAA. ACP-2019-18 is the airspace change identification of the ACP which was originally entitled “Enabling Remotely Piloted Air System Operations out of RAF Waddington”.

- *Either* employ an appropriately approved Detect and Avoid (DAA) capability to enable compliance with the Rules of the Air appropriate to the class of airspace,
- *or* be flown using a Layered Safety Approach that specifically requires flight in segregated airspace.

2.2 When Protector comes into service it will be fitted with a limited DAA capability only, which is not likely to meet the requirements to fly in all classes of airspace. The working assumption is that Protector will be able to fly within classes A and C airspace without restriction. Since RAF Waddington is located within class G airspace, some form of airspace segregation is required for its transit through current class G airspace in order to be able to achieve onward transit using classes A and C airspace.

3 Reason for Integration of RAFAT Activity into this ACP

The Royal Air Force Aerobatic Team (RAFAT), better known as the Red Arrows, have represented the Royal Air Force and the United Kingdom since 1965. Widely acknowledged as one of the world's premier display teams, they represent the speed, agility and precision of the RAF, assist in Armed Forces recruitment and promote the best of British. The Team fly the BAE SYSTEMS Hawk TMk1 fast jet trainer.

3.1 In recent months a requirement has emerged for RAFAT to be able to conduct flying display activity over RAF Waddington and after discussions with the CAA it has been agreed that it would be appropriate for this new requirement to be integrated into the Protector ACP.

3.2 In 2018 RAFAT started an ACP, identification ACP-2018-72 (Relocation of RAFAT training airspace), which was subsequently withdrawn in May 2020. Through this RAFAT ACP the MOD was investigating options to develop airspace over one of 3 specific aerodromes from which RAFAT might conduct its aerobatic training practices in the event that the restricted airspace over Scampton (EG R313) became no longer available to them. The ACP passed through CAP1616 Stage 1 with a set of Design Principles (DPs) that had been developed via engagement with appropriate stakeholders. The 3 locations under consideration were RAF Waddington, RAF Wittering and RAF Leeming. Since the ACP was withdrawn in 2020, the availability of EG R313 has again been placed in doubt for use by RAFAT. Assessment of the viable options for RAFAT indicate that access to airspace over RAF Waddington would be beneficial to the team.

4 Actions required for Integration of RAFAT Activity into this ACP

4.1 The Change Sponsor for ACP-2019-18 has agreed with the CAA that the best way to meet both the Protector and RAFAT requirements is to do so under one ACP and has further agreed the means by which to do this without repeating Stage 1 of

ACP-2019-18. It was also felt that running two ACPs at the same location could be confusing to stakeholders and incur duplication of effort for all parties involved. Both the Protector and RAFAT ACPs have passed through the CAP1616 Stage 1, where a set of DPs was agreed for each ACP. The DPs were agreed through stakeholder engagement and many of you reading this letter will have been involved with one or other ACP, if not both.

4.2 DPs are developed with stakeholders to provide a shortlist of principles to inform the development of airspace design options. In order to ensure that the DPs agreed for ACP-2018-72 (Relocation of RAFAT training airspace) are covered sufficiently by those agreed for ACP-2018-19, the Change Sponsor has completed a comparison of the two sets of DPs and has offered a summarised rationale of this to the CAA. The summary is at Annex A; you are invited to take a look and provide comment. If no comment is received it will be assumed that you are in accord with the Change Sponsor's rationale. Table 1 shows the DPs for ACP-2019-18 following the Change Sponsor's rationalisation.

4.3 The Change Sponsor also completed a comparison of the stakeholder lists for both ACPs and has incorporated any stakeholders from the RAFAT ACP into the Protector ACP, if they were not already within the latter's stakeholder lists. Unfortunately there was a small group of RAFAT stakeholders (mainly from drop-in sessions and Facebook) who did not leave contact details, so the MOD has not been able to connect with them. The MOD will continue to try to reach as many stakeholders as possible through as many means as practicable.

4.4 More details on how the Change Sponsor agreed the above actions with the CAA can be found on the CAA Airspace Change Portal here[2].

5 Layout of this Letter

5.1 A new Statement of Need has been produced to incorporate the RAFAT activity. This is provided below and the extant DPs are re-iterated before the document outlines the various airspace design options considered to meet the Statement of Need.

6 Statement of Need

6.1 There is a requirement for a large Remotely Piloted Air System (RPAS) to operate out of RAF Waddington from the mid-2020s. Pursuit of an ACP optimises an approach, in terms of efficiency and safety, for RPAS to operate from and to RAF Waddington. Furthermore, this approach will support the safe integration of the RPAS into the national airspace structures, given the anticipated performance of on-board systems and the surrounding airspace classification. Access to existing training areas around the UK will also be considered as part of the integration into the national airspace structures. There is an emerging requirement for the RAF Aerobatic Team to conduct display flying activity over RAF Waddington from early 2023 following the Team's relocation from RAF Scampton in late 2022. Integration of this requirement within the Protector ACP is considered the safest operating model.

[2] Airspace change proposal public view (caa.co.uk)

7 Design Principles

7.1 Table 1 shows the DPs for ACP-2019-18 following the Change Sponsor's rationalisation.

Priority	Design Principle
1	DP(a) Provide a safe environment for airspace users *including consideration of the risk to life of those on the ground during RAFAT display practices*
2	DP(b) Provide access to sufficient area for both training and operational objectives
3	DP(c) Where possible and practicable, accommodate the emerging Airspace Modernisation Strategy DP(d) Minimise the impact to other airspace users
4	DP(e) Endeavour to make the airspace as accessible as possible DP(f) Use Flexible Use of Airspace (FUA) principles to manage the airspace as far as is practicable (Efficiency and Airspace Sharing)
5	DP(g) Use standard airspace structure where possible (Conformity, Simplicity and Safety)

Table 1 - ACP-2019-18 DPs following rationalisation with ACP-2018-72 DPs

7.2 Taking into account feedback received, the MOD undertook a number of engagement activities to help shape the DPs for both the Protector and RAFAT activities. Safety is the highest priority and so DP(a) was automatically assigned Priority 1. During the rationalisation of the RAFAT DPs with the Protector DPs it was felt that there was merit in including the amplifying text "including consideration of the risk to life of those on the ground during RAFAT display practices" since the original Protector DP made no specific mention of the safety of those on the ground. MAA RA 2320[3] stipulates the MOD's responsibility towards risk to life from the collision of RPAS and, therefore, the DP does not need further amplification for Protector. The DP has been amended to reflect the requirement for RAFAT only (amplifying text in italics in Table 1).

7.3 The MOD feels that the ability to complete its training and operational objectives is next in priority after safety and so DP(b) is assigned Priority 2.

7.4 Comparison of the RAFAT and Protector DPs revealed that one RAFAT DP was not covered by the Protector DPs. This DP stated that "The design must consider sensitive areas. Specific sensitive areas for military aircraft will be determined through consultation. Examples may include, but not be limited to: hospitals, industrial hazards and equestrian facilities". The MOD feels that its obligation through the CAP1616 process is to assess how the RAFAT activity might affect ***civil airspace users*** which might, in turn, affect sensitive areas and **not** the direct impact of the **military activity**. For this reason, it is not felt to be appropriate for measurement though a DP and, therefore, this DP has been excluded. That said, the MOD will endeavour to minimise any such impact if identified through the engagement and consultation phases and more specifically once the airspace design options have been finalised.

7.5 The method of allocating the remaining DPs in order of priority was determined by the comments received, not just upon the volume of responses.

[3] MAA RA 2320 - MAA regulation for operation of military RPAS, issue 4, paragraph 2 states *"ADHs/AM(MF)s **should** ensure that the RtL from collision of RPAS with any vessels, vehicles, structures, personnel or the surface is ALARP and Tolerable."*

8 Design Options

8.1 In accordance with the CAP1616 process, the MOD engaged extensively earlier this year in the run up to the establishment of a Temporary Danger Area at RAF Waddington for the operation of SkyGuardian, the Protector prototype. Whilst the MOD cannot use this information directly within this joint Protector and RAFAT ACP, we were able to determine what was important to other airspace users, in particular in the Waddington area. We have used some of the feedback received from the SkyGuardian engagement in the development of the initial airspace design options.

8.2 The MOD has prepared a comprehensive range of airspace design options upon which it is inviting feedback and comment from those stakeholders engaged with to date. The options are broken into two categories:

a. Airspace designs for the airspace in the vicinity of RAF Waddington below 9500 ft above mean sea level (AMSL) (known as **low level airspace design options**);
b. Airspace designs for the airspace in the vicinity of RAF Waddington 9500 ft AMSL – FL195 (known as **medium level airspace design options**).

8.3 At least one low level and one medium level airspace design will be required to accommodate Protector's operation in the UK; the RAFAT activity will only require one low level airspace design; RAFAT will not require access to any medium level airspace designs.

8.4 Low Level Airspace Design Options:

8.4.1 The MOD has prepared six low level airspace design options for the airspace in the vicinity of RAF Waddington below 9500 ft AMSL. Responses from stakeholders on how they perceive the suitability of these options and their preferences are invited, as this will help determine the airspace design options to take through to Stage 3. All except Option 1 LOW will accommodate both the Protector and RAFAT activities. Continuing work is being conducted within the MOD to see if the airspace design could be reduced to the volume of airspace depicted by Option 1 LOW without unacceptable impact on safety or operational capability for Protector in the UK. For this reason it is included here. Option 1 LOW would be the MOD's preferred airspace design option within the low level design category if it could be made to work for Protector. Option 1 LOW will accommodate the RAFAT activity.

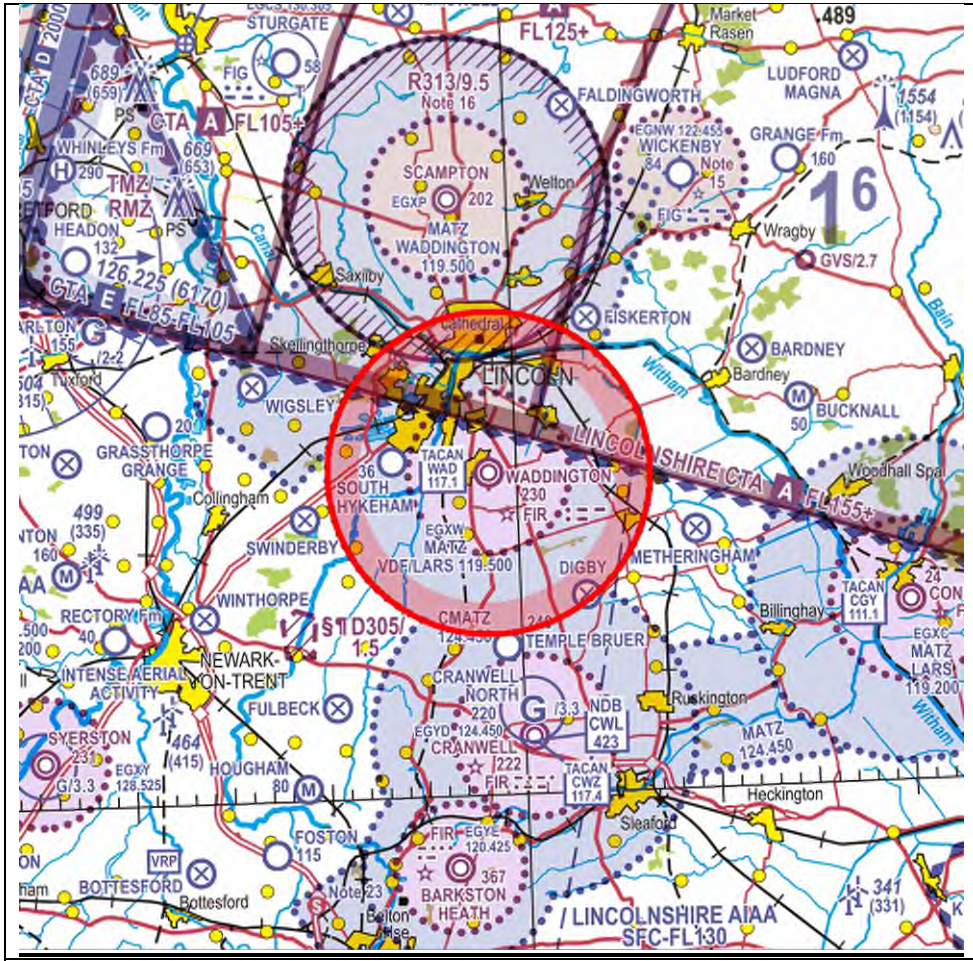
8.4.2 The low level airspace design options are intended for use as follows:

- Protector will use this airspace:
  - During departure from RAF Waddington's main runway. It will execute its automatic take-off profile and perform a spiral climb to 9500 ft AMSL when it will enter one of the medium level airspace design options;
  - During recovery to RAF Waddington. It will enter one of the low level airspace design options at 9500 ft AMSL from one of the medium level airspace design options. It will then perform a spiral descent and execute its automatic landing profile to the main runway;
  - During necessary live-flying training sorties, it may remain wholly within a low level airspace design option.

- RAFAT will use this airspace to conduct its flying display practices from surface to 9500 ft AMSL.

8.4.3 The MOD has selected 9500 ft AMSL as the upper level for the low airspace design options in order to safely accommodate the RAFAT display activity. Since there has to be an onward connection with the medium level airspace design options to enable Protector to continue its climb to access classes A & C airspace, the medium airspace design options will have a lower level of 9500 ft AMSL.

8.4.4 The MOD is reasonably flexible in the choice of upper limit of the low airspace design options; the deciding factors are that it must be high enough to accommodate the RAFAT activity and must enable connection to the medium airspace design options. The MOD is keen to receive feedback from other airspace users and comment is, therefore, invited. The low level airspace design options are as follows:



Option 1 LOW

Activation:
Option 1 would be used for both RAFAT and Protector, but only if the MOD is able to develop procedures for Protector which would not unacceptably impact safety or operational capability for Protector in the UK.

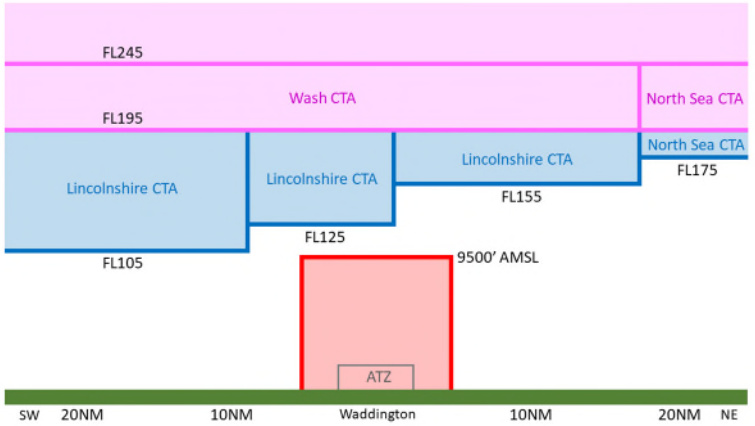
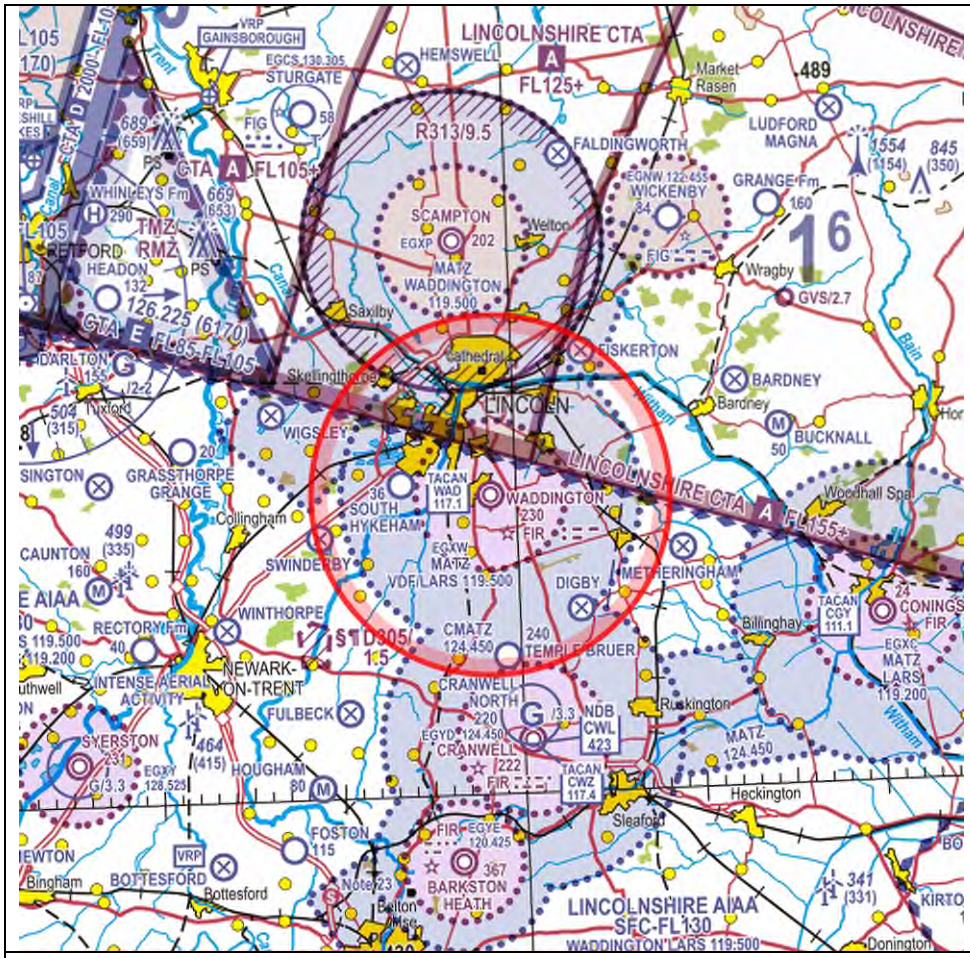


Figure 1- Cross-section SW/NE through extended centreline for RW02/20

Lateral Dimension: 5 nm radius circle centred on RAF Waddington's aerodrome reference point (ARP). .

Vertical Dimension: Surface to 9500 ft AMSL.



Option 2 LOW

Activation:
Option 2 would be used for both RAFAT and Protector activities.

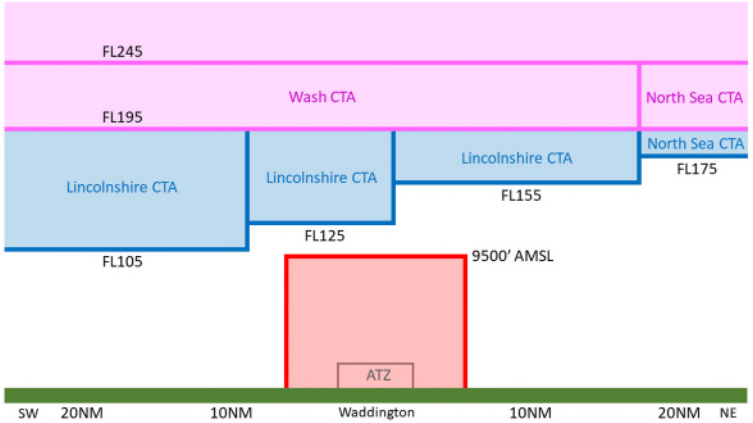
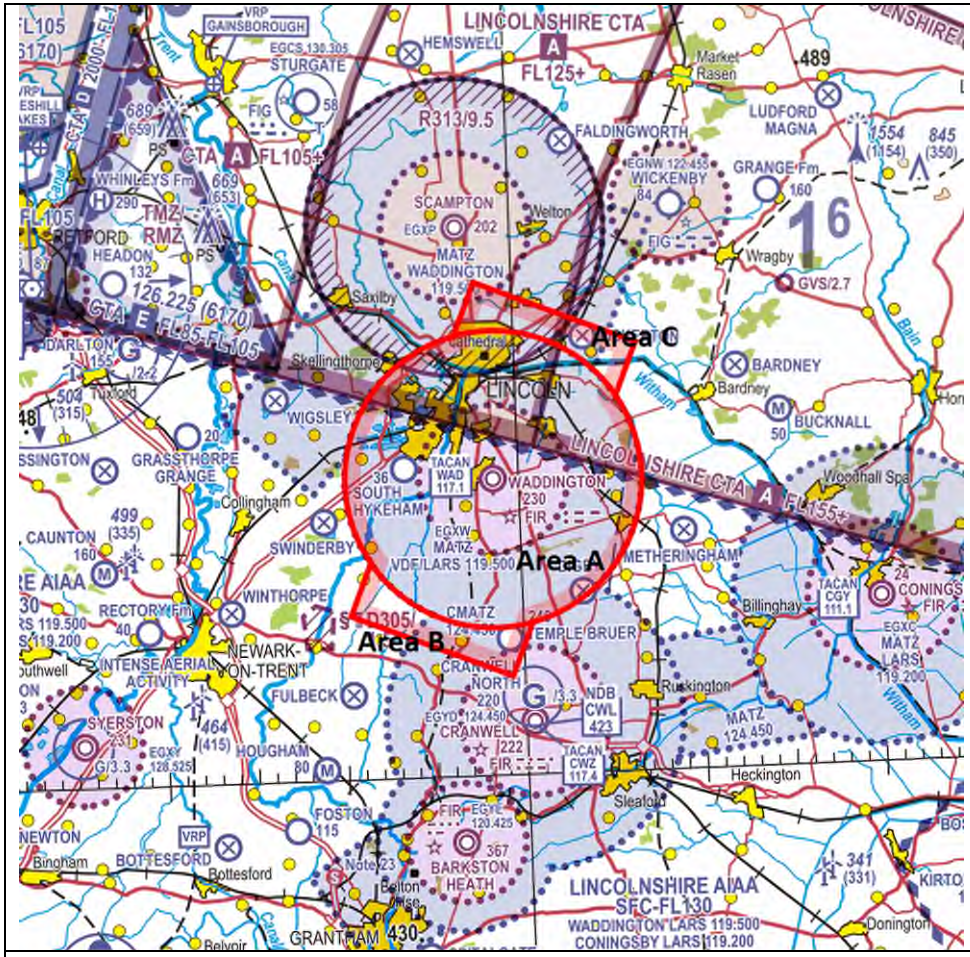


Figure 2 - Cross-section SW/NE through extended centreline for RW02/20

Lateral Dimension: 6 nm radius circle centred on RAF Waddington's ARP.

Vertical Dimension: Surface to 9500 ft AMSL.



Option 3 LOW

Activation:
Area A would be activated for RAFAT activity.
Areas A, B & C would be activated for Protector activity.
Areas A, B & C would be activated simultaneously when both activities are planned.

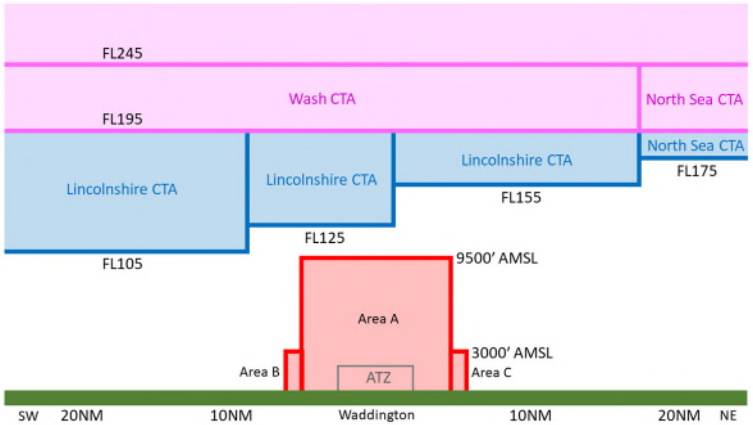
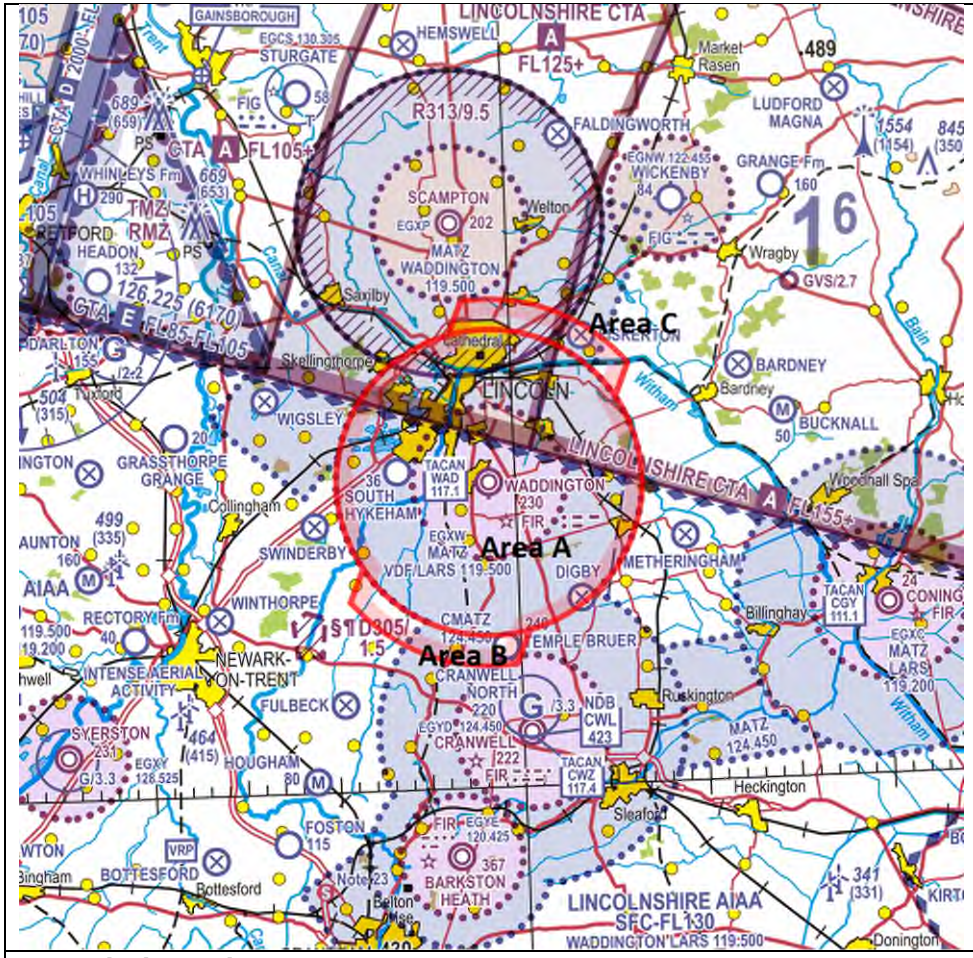


Figure 3 - Cross-section SW/NE through extended centreline for RW02/20

Lateral Dimension:
Area A - 5 nm radius circle centred on RAF Waddington's ARP:
Areas B & C - stubs aligned with the runway centreline, extending from boundary of Area A to 6 nm from ARP into RW02/20 approach/departure lanes and 3 nm either side of RW02/20 extended centreline. The ends of the stubs are perpendicular to the runway extended centrelines.

Vertical Dimension:
Area A - Surface to 9500 ft AMSL;
Areas B & C - Surface to maximum 3000 ft AMSL.



Option 4 LOW

Activation:
Area A would be activated for RAFAT activity.
Areas A, B & C would be activated for Protector activity.
Areas A, B & C would be activated simultaneously when both activities are planned.

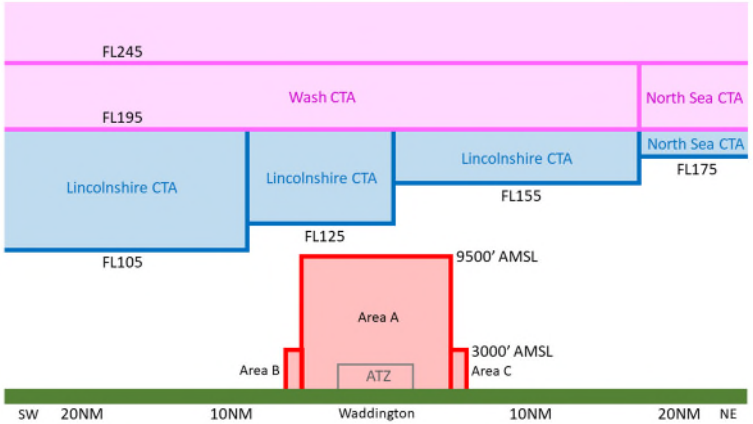
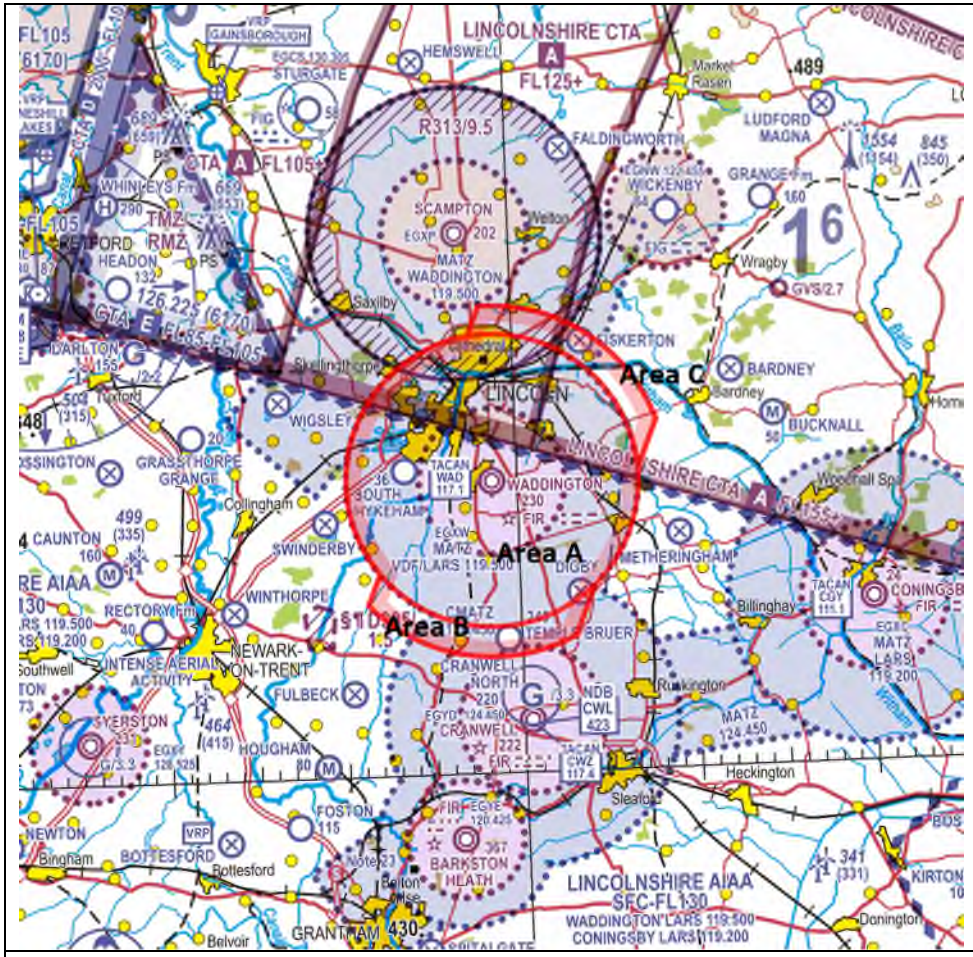


Figure 4 - Cross-section of SW/NE through extended centreline for RW02/20

Lateral Dimension:
Area A - 5 nm radius circle centred on RAF Waddington's ARP;
Areas B & C - stubs aligned with the runway centreline, extending from boundary of Area A to 6 nm from ARP into RW02/20 approach/departure lanes and 3 nm either side of RW02/20 extended centreline. The ends of the stubs follow a 6 nm arc measured from the ARP.

Vertical Dimension:
Area A - Surface to 9500 ft AMSL;
Areas B & C - Surface to maximum 3000 ft AMSL.



Option 5 LOW

Activation:
Area A would be activated for RAFAT activity.
Areas A, B & C would be activated for Protector activity.
Areas A, B & C would be activated simultaneously when both activities are planned.

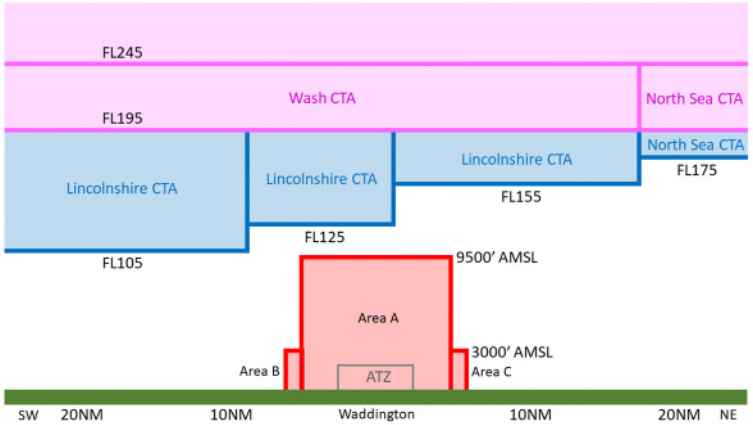
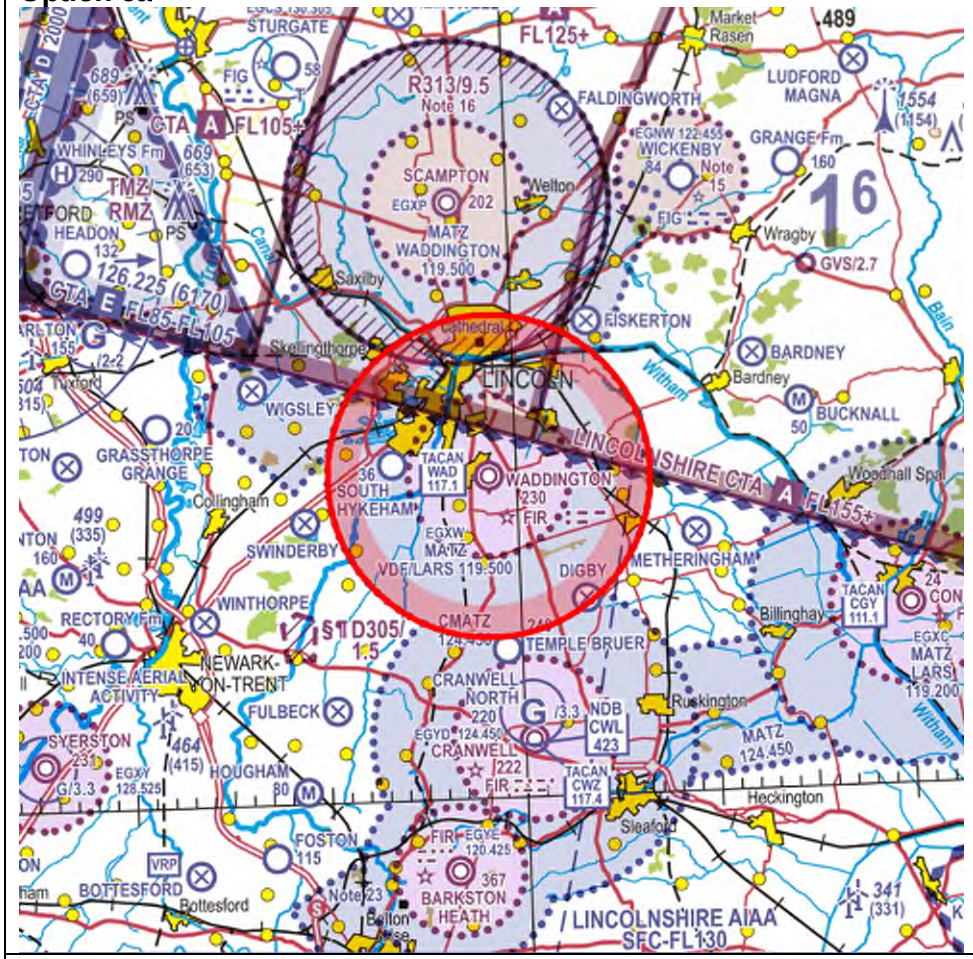


Figure 5 - Cross-section SW/NE through extended centreline for RW02/20

Lateral Dimension:
Area A - 5 nm radius circle centred on RAF Waddington's ARP;
Areas B & C – areas extending from the boundary of Area A to follow a 6 nm arc measured from the ARP, starting 2.5 nm west of the RW02/20 extended centreline and finishing 4.5 nm east of the RW02/20 extended centreline.

Vertical Dimension:
Area A - Surface to 9500 ft AMSL;
Areas B & C - Surface to maximum 3000 ft AMSL.

Option 6a



Lateral Dimensions:
Option 6a LOW - 5 nm radius circle

Option 6 LOW

Activation:
Option 6a would be activated for RAFAT-only activity
Option 6b (areas A, B & C) would be activated for Protector-only activity
Options 6a & 6b (areas A, B & C) would be activated simultaneously when both activities are planned.

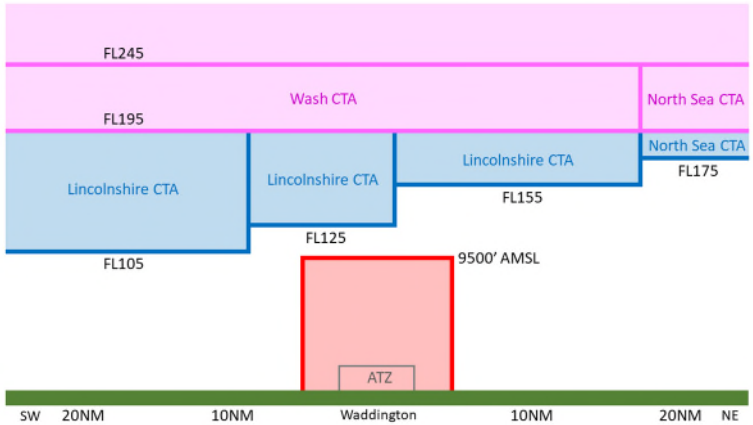


Figure 6 - Cross-section SW/NE through extended centreline for RW02/20

Vertical Dimensions:
Option 6a LOW - Surface to 9500 ft AMSL

Option 6b LOW

Option 6 LOW (continued)

Activation:
Option 6a would be activated for RAFAT-only activity
Option 6b (areas A, B & C) would be activated for Protector-only activity
Options 6a & 6b (areas A, B & C) would be activated simultaneously when both activities are planned.

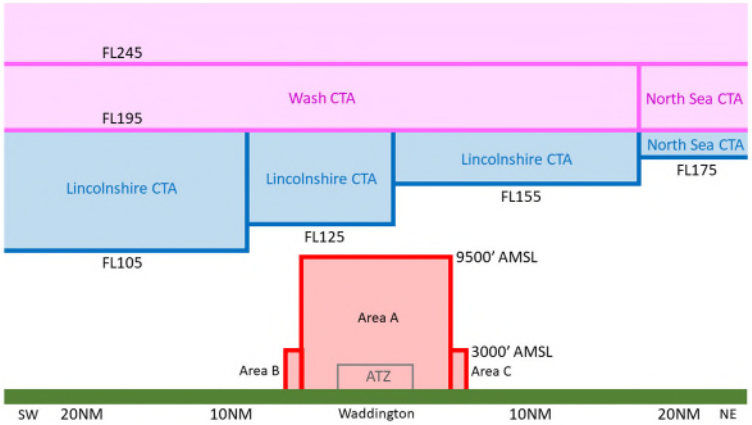


Figure 7 - Cross-section SW/NE through extended centreline for RW02/20

Lateral Dimensions:
Area A is made up of a 5 nm radius circle with segments removed to the west and east of the circle. The western edge runs along a line 2.5 nm west of and parallel to the RW02/20 centreline. The eastern edge runs along a line running 4.5 nm east of and parallel to the RW02/20 centreline.
Areas B & C – areas extending from the 5 nm arc of Area A to follow a 6 nm arc measured from the ARP, starting 2.5 nm west of the RW02/20 extended centreline and finishing 4.5 nm east of the RW02/20 extended centreline.

Vertical Dimensions:
Area A – Surface – 9500 ft AMSL
Areas B & C – Surface to maximum 3000 ft AMSL

8.5 Medium Level Design Options

8.5.1 The MOD has prepared two airspace design options for the airspace in the vicinity of RAF Waddington between 9500 ft AMSL and FL 195. Responses from stakeholders on how they perceive the suitability of these options and their preferences are invited as this will help determine the airspace design options to take through to Stage 3. Both options will accommodate the Protector activity as it climbs to reach class A or C airspace. Option 7 MEDIUM comprises the smaller volume of airspace and the Change Sponsor hopes that the MOD will be able to accommodate the Protector activity within this option. Work is ongoing to develop a safety argument that would enable this. However, should it become necessary, airspace design Option 8 MEDIUM will need to be considered. The MOD is particularly interested in feedback from NATS in this respect.

8.5.2 Options 7 and 8 MEDIUM are located directly beneath class C airspace, which during specified hours[4] is activated as a Temporary Reserved Area (TRA). The MOD is aware that a robust argument must be made for an active TRA to be considered a safe environment for Protector operation and is working on this argument. The upper limit of FL195 for Options 7 and 8 MEDIUM is predicated on this argument being able to be made.

8.5.3 The RAFAT activity will not require access to either of the medium level airspace design options.

8.5.4 The medium level airspace design options are as follows:

[4] Mon-Fri 0830 to 1700 UTC Winter; Mon-Fri 0730 to 1700 UTC Summer; Excluding English Public Holidays. TRA may be activated at other times by NOTAM.

Option 7 MEDIUM

Activation:
Provided a safety argument can be made with respect to the CAA Safety Buffer Policy, Option 7 would be activated for Protector activity only, to enable Protector to continue climb into classes A and/or C airspace.

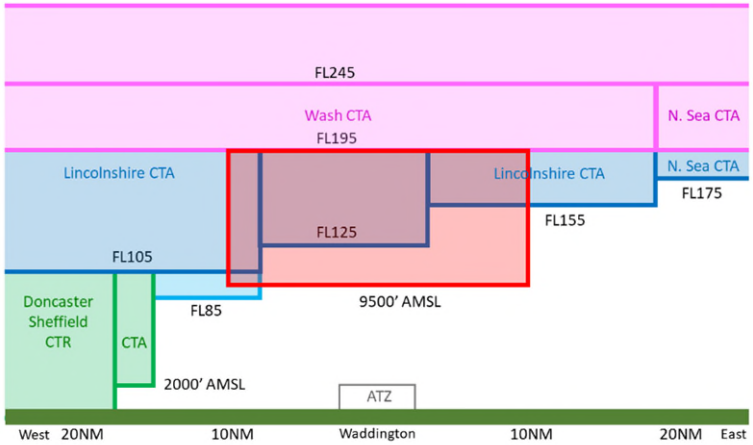
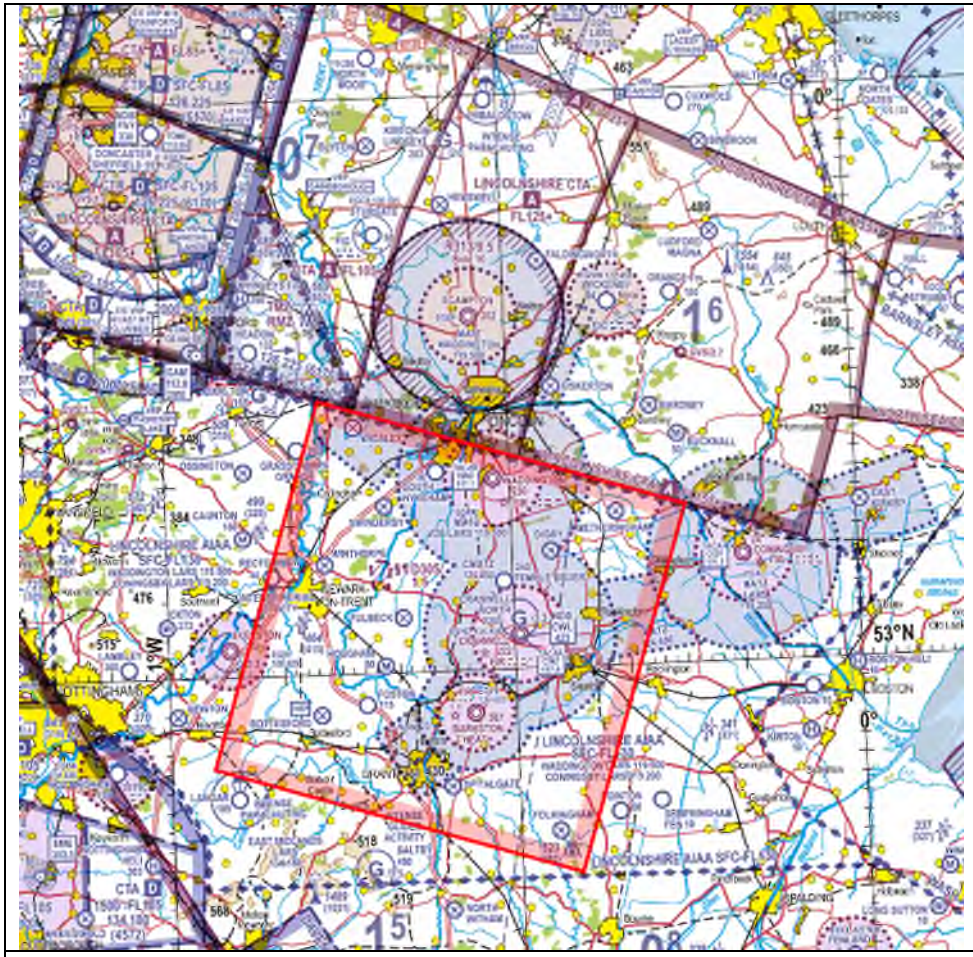


Figure 8 - Cross-section through a line running parallel to the abutting Lincolnshire CTA

Lateral Dimension: 20 x 10 nm rectangle aligned to and abutting the southern edge of the Lincs CTA.

Vertical Dimension: 9500 ft AMSL – FL195



Option 8 MEDIUM

Activation:
In the event that the safety argument determines that the additional airspace is required to satisfy the CAA Safety Buffer Policy, Option 8 would be activated for Protector-only activity to enable Protector to continue climb into classes A and/or C airspace.

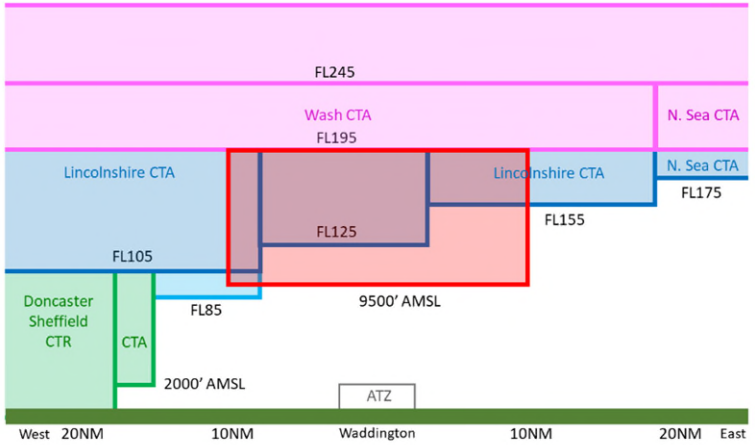


Figure 9 - Cross-section through a line running parallel to the abutting Lincolnshire CTA

Lateral Dimension: 20 x 20 nm rectangle aligned to and abutting the southern edge of the Lincs CTA.

Vertical Dimension: 9500 ft AMSL – FL195

9 Volume of Airspace to Accommodate RAFAT and Protector Activities

9.1 **RAFAT –** RAFAT practice and display flying activity requires a volume of airspace of at least 5 nm radius from surface to 9500 ft AMSL. Owing to limited manoeuvrability while engaged in close formation aerobatics, often involving high speed and high energy manoeuvres, ensuring safe separation from other airspace users is considered vital for air safety.

9.2 **Protector** - The airspace design options for Protector have been developed in close communication with the air vehicle manufacturer, General Atomics – Aeronautical Systems Incorporated (GA-ASI), and the RAF subject matter experts both at RAF Waddington and within a team embedded with GA-ASI in the USA. The Protector air system is equipped with an Automatic Take-Off and Landing Capability (ATLC) which means that Protector will follow pre-determined flight profiles for the initial departure and final approach phases of flight. Specifically, the current landing profile under development for RAF Waddington requires flight to approximately 5.5 nm downwind for each runway (measured from the ARP). To accommodate this portion of flight, Options 3 – 6 LOW have segregated airspace out to 6 nm and up to 3000 ft AMSL along RW02/20 extended centrelines. The MOD is continuing to work with the manufacture and RAF subject matter experts to understand if the flight profiles can be reduced in size without compromising safety or operational aims. If this is possible, reductions to the lateral and/or vertical dimensions will be made. **Error! Reference source not found.** and **Error! Reference source not found.** are for illustrative purposes and depict the current ATLC pattern profiles for approaches to RW02 and RW20 respectively at RAF Waddington. They are overlaid on Option 6b for reference.

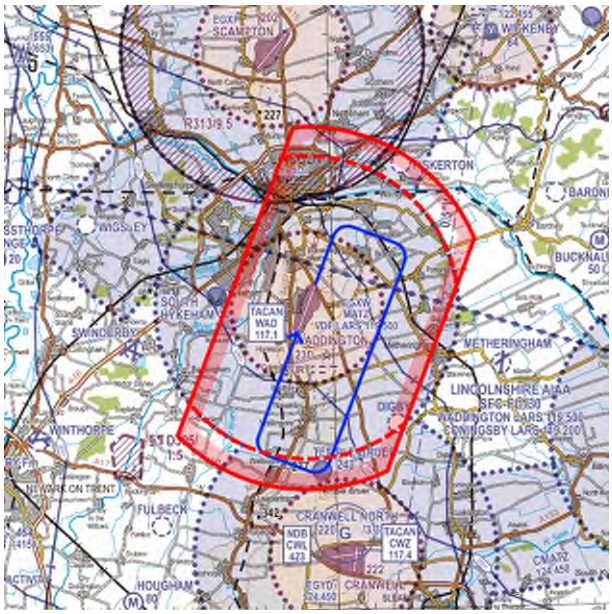


Figure 10 - ATLC Profile for RW02

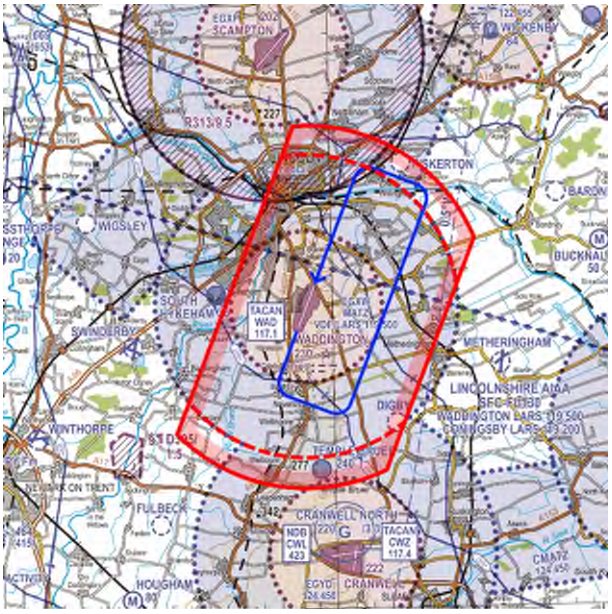


Figure 11 - ATLC Profile for RW20

9.3 It is unlikely that Protector will conduct multiple ATLC circuit patterns for training reasons. Rather, for a departure scenario it will take-off and continue the climb to depart the local area; similarly on recovery, it will descend to join the ATLC pattern from above to complete a landing.

9.4 **Error! Reference source not found.** shows a recovery profile from height to join the ATLC pattern on the downwind leg prior to completing an automatic landing profile. It is overlaid on Option 6b for illustrative purposes only.

Figure 12 - RW02 Automatic Landing Profile for a Descent to Final Approach

9.5 Furthermore, provision must be made to accommodate simultaneous Protector departure and recovery profiles within its segregated airspace once away from the immediate vicinity of the aerodrome, including consideration for platform-specific contingencies. The airspace design options have been sized to manage Protector's

operation as efficiently as possible following guidance from GA-ASI and the RAF subject matter experts.

9.6 Note that operations in both runway directions are being supported in each airspace design. Protector has a long endurance (20 hrs+) and the MOD designs needs to cater for the event of a runway change.

10 Type of Airspace to Accommodate RAFAT and Protector Activities

10.1 RAF Waddington sits entirely within class G airspace, which ordinarily does not provide adequate protection or segregation respectively for RAFAT and Protector at IOC. The MOD has given much thought to the most appropriate type of airspace to accommodate both activities and a summary follows, taken in turn by each activity and then further summarised in Table 2 below.

10.2 **RAFAT** - The RAFAT activity is afforded additional protection at RAF Scampton through the establishment of EG R313, which is active on a permanent basis Monday – Friday. This structure is a 5 nm radius cylinder of airspace reaching from surface to 9500 ft AMSL (specified as Regional Pressure Setting). Thought has been given to providing similar protection at RAF Waddington. However, it is felt that an equal measure of protection could be achieved via a less permanent structure, particularly since during RAFAT activity full radar surveillance and air traffic services would be provided by military ATC. Some form of controlled airspace, restricted airspace or danger area would seem appropriate.

10.3 **Protector** – In broad terms civil and military regulations specify that without an appropriately approved DAA capability, Protector must be flown using a Layered Safety Approach that specifically requires flight in segregated airspace. Protector is fitted with TCAS II, which may be approved to provide a DAA capability in airspace where all traffic can be expected to be operating a transponder (i.e. transponder-mandatory airspace). The MOD is producing an Airspace Integration Safety Argument (AISA) for the introduction of Protector at IOC into UK airspace. This work aims to develop an evidenced argument for the safe operation of IOC Protector under Instrument Flight Rules (IFR) and under an air traffic service within transponder-mandatory airspace, as well as in suitable segregated airspace. The AISA is therefore looking at the following types of airspace:

- Class A airspace:
- Class C airspace;
- Class D airspace that is notified as a Transponder Mandatory Zone (TMZ)[5];
- Class E airspace that is notified as a TMZ, although it is thought to be less likely to be able to produce an acceptable safety argument;
- Class G airspace, segregated in the form of a notified Danger Area.

[5] Class D is usually designated around an aerodrome, hence not above FL100

Type of segregated airspace	Suitability for RAFAT	Suitability for Protector	MOD Comment
Class A	No	Yes	IFR flight is mandatory in class A airspace, which is not suitable for RAFAT
Class C	Yes	Yes	Not justifiable in terms of: o Restrictions placed on other airspace users; o Air traffic management resourcing; o Flexible use of airspace (notified hours of activation in UK AIP).[6]
Airspace Class D above FL100 or if below FL100 is also a TMZ[7]	Yes	Yes	Not justifiable in terms of: o Restrictions placed on other airspace users; o Air traffic management resourcing; o Flexible use of airspace (notified hours of activation in UK AIP).
Class E	Unknown	Unknown	Pending AISA for Protector, but thought unlikely to be suitable.
Class G Danger Area	Yes	Yes	Less impact on other airspace users since it can be tactically managed (does not have notified hours of activation in UK AIP)
TMZ/RMZ	No	Possibly	Not considered

Table 2- Proposed Airspace Types for Consideration with MOD Comment

10.4 It is envisaged, therefore, that the most economical type of airspace to be implemented (in terms of hours of activation, access to airspace and manpower resource) would be segregated airspace in the form of a danger area. However, the MOD is keen to understand other airspace users' views on the type of airspace to be implemented for the low and medium level airspace design options.

11 Measures to Minimise the Impact on other Airspace Users

11.1 General

11.1.1 The type of airspace implemented will certainly drive the overall hours of airspace activation. As suggested above, the implementation of segregated airspace in the form of a danger area will provide the most efficient and tactical use of airspace, since the MOD will be able to activate the airspace structures only as and when necessary. In other words, only when activity by either RAFAT or Protector is planned. The ability to activate airspace specific to one or other activity might be preferable to other airspace users. In other words if Protector was not planned to fly, but RAFAT was, the "stubs" incorporated in several designs would not be activated. Conversely if RAFAT was not planning to fly, the minimum airspace required for Protector would be notified.

[6] Whilst there is current discussion regarding the possibility of tactically turning controlled airspace volumes on and off, the likely timescale involved precludes it as an option for this ACP.

[7] TMZ = Transponder Mandatory Zone.

11.1.2 In any event, the proposed airspace will not be permanently active; it will only be activated when RAFAT or Protector flying is due to take place. Proven procedures will be adopted to ensure that the airspace is activated and notified as and when required. This will involve appropriate NOTAM action being taken at least 24 hrs in advance. To ensure minimum disruption to other airspace users a Danger Area Crossing Service (DACS) will be offered within all implemented airspace. This means that, even if the airspace has been notified as being active, it may be possible for both civil and military aircraft to transit through it under a clearance from either RAF Waddington or Swanwick Military.

11.1.3 RAF Waddington ATC will be manned at all times during RAFAT and Protector operations. Information on the current status of the airspace will be available, including a DACS from RAF Waddington or other appropriate military ATC units.

11.2 Utilisation of Airspace

11.2.1 It is difficult to offer an accurate rate of use for the airspace by both RAFAT and Protector at this time, since there are many changing variables. However, the following is offered as a guide.

11.2.2 **RAFAT** - The Defence Infrastructure Organisation has presented the real estate at RAF Scampton for sale without any caveats for the enduring RAFAT activity. Therefore, from April 2023 RAFAT may not be able to make use of EG R313. At this time the MOD can offer 2 scenarios for consideration for its activity at RAF Waddington:

- Should EG R313 remain available for RAFAT display activity, the requirement for activity at RAF Waddington could be 4 – 5 lunchtime sessions per week during the winter for corporate visits (late Sep – early Apr).
- If EG R313 were not available for RAFAT display activity, the requirement for activity at RAF Waddington could be 3 - 6 display practices per day (late Sep – early Apr). **In this scenario EG R313 would almost certainly be permanently withdrawn.**
- Display practices will normally take place Monday – Friday during daylight hours.
- There is likely to be a requirement for occasional weekend use during summer (mid May - late Sept) for In Season Practice (ISP). This is an activity that is required if RAFAT approaches approximately one week having not displayed and is designed to keep the display sharp. It is probable that with a reduction in airshows that normally keep RAFAT current, this weekend requirement may increase, although it currently tends to normally occur Monday - Friday. Occurrence is potentially not more than twice per month (Monday - Sunday).

11.2.3 **Protector –** Excepting operation commitments, it is anticipated that during the first 6 months of Protector's service in the RAF, the flying tempo will be restricted to one air vehicle at a time during core flying hours Monday – Friday. This is likely to occur up to 3 times per week. After that and up to the first 24 months of service, there may be up to 2 air vehicles in the air simultaneously. Some night-flying is expected. More detail will be provided as it becomes available.

12 How to Provide Feedback

12.1 The MOD welcomes comments and feedback from all interested parties. All comments received regarding this proposal will be taken into consideration before taking our designs through to CAP1616 Stage 3. All the details of this airspace change proposal are available on the CAA's Airspace Change Portal. The ACP identification number is ACP-2019-18. Feedback on the proposed change and what is important to you should be sent to:

The Airspace Change Manager at UASCDC-ACP@qinetiq.com

12.2 A feedback form is provided at Enclosure 1 and a Word document is attached to the email containing this material for your use if you wish.

12.3 **Responses regarding the proposed TDA submission must be received by 17 Dec 2021.**

[redacted]

P J DOWNER
Change Sponsor

Annex:

A. Rationalisation of ACP-2018-72 (RAFAT) and ACP-2019-18 (Protector) Design Principles

Enclosure:

1. ACP-2019-18 – Stage 2 Engagement Feedback Response Form

Annex A

Rationalisation of ACP-2018-72 (RAFAT) and ACP-2019-18 (Protector) Design Principles

ACP-2018-72 (RAFAT) DPs	Covered by ACP-2019-18 (Protector) DPs	Comment
DP(1). The design should be such that the MAC & CFIT risk for the RAFAT and airspace users in the region is no greater than that provided by EG R313	DP(a) Provide a safe environment for airspace users	The MOD believes that RAFAT DP(1) is covered within the intention of ACP-2019-18 DP(a). DP(a) caters for the safety of both Protector and RAFAT activities within the airspace boundaries, as well as the safety of other airspace users. This incorporates airspace users both operating within the airspace boundaries and within the proximity of the airspace whilst outside its boundaries.
DP(2). Ensure that the risk to life associated with RAFAT operations within the airspace is Tolerable and ALARP	DP(a) with amplifying text as follows: "Provide a safe environment for airspace users, including consideration of the risk to life of those on the ground during RAFAT display practices."	Inclusion of amplifying text is thought to be sensible since ACP-2019-18 DP(a) did not make specific mention of the safety of those on the ground.
DP(3). The design must consider sensitive areas. Specific sensitive areas for military aircraft will be determined through consultation. Examples may include, but not be limited to: hospitals, industrial hazards and equestrian facilities.		The MOD feels that its obligation through the CAP1616 process is to assess how the RAFAT activity might affect civil airspace users which might, in turn, affect sensitive areas and not the direct impact of the military activity. For this reason, it is not felt to be appropriate for measurement though a DP and, therefore, this DP has been excluded. That said, the MOD will endeavour to minimise any such impact if identified through the engagement and consultation phases and more specifically once the airspace design options have been finalised.
DP(4). The design must consider ATC workload	DP(a) & DP(e) DP(a) Provide a safe environment for airspace users & DP(e) Minimise the impact to other airspace users	Since RAFAT will be moving their practice display location from RAF Scampton to RAF Waddington, the area (and hence the other ATC units) affected will be largely the same. An assessment of any additional burden on local ATC units will be made during the engagement and consultation phases. At this stage we feel that the specific principle regarding ATC workload is covered off jointly by ACP-2019-18 DP(a) & DP(e).
DP(5). The design must provide sufficient area for training	DP(b) Provide access to sufficient area for both training and operational objectives	
DP(6). The design must be within a usable flying time to RAF basing for transit	N/A	RAFAT DP(6) is not applicable since the RAFAT display practices will take place overhead RAF Waddington, where the team will be based - no additional flying/transit time is required.
DP(7). The design must use FUA principles to manage the airspace as far as is practicable (Efficiency & Airspace Sharing). Use of the full range of systems available to provide notification of airspace status will be considered.	DP(e), (f) & (g) DP(e) Minimise the impact to other airspace users DP(f) Endeavour to make the airspace as accessible as possible DP(g) Use Flexible Use of Airspace (FUA) principles to manage the airspace as far as is practicable (Efficiency and Airspace Sharing)	The Change Sponsor feels that the additional text in DP(7) regarding the use of the full range of systems available to provide notification is not necessary as the intention to do much of this is implicit in ACP-2019-18 DPs (e) and (f). ACP-2019-18 Stage 1b submission refers to maximising use of air traffic services, NOTAM system etc.
DP(8). The design must use standard airspace structure where possible (Conformity, Simplicity and Safety)	DP(g) Use standard airspace structure where possible (Conformity, Simplicity and Safety)	

ACP-2019-18 - Stage 2 Engagement Feedback Response Form

Name	
Representing	
Address (including postcode if possible)	
We would be interested in feedback on the following items. Use additional space at the end of this form to provide comment on anything else.	
Do you have any comments on the design principles?	
Feedback on airspace design options presented and their dimensions (including order of preference and rationale, if appropriate).	

Feedback on preferred type(s) of segregated airspace to be implemented (including order of preference and rationale, if appropriate).
What is your biggest concern, if any, about this ACP?
Would this proposal impact you and, if so, are there any changes you would like to put forward for consideration?
If you are a pilot do you routinely: • Operate an airband radio? Yes No • Operate a transponder? Yes No • Speak to ATC? Yes No • Fly above FL50? Yes No • Fly above FL100? Yes No

If you are a pilot how often do you fly within the boundaries of the proposed airspace (approximately per day / week / month)? • Options 1 – 6 • Options 7 - 8
Any other feedback