Stage 4 Submit

Final Airspace Change Proposal

ACP-2023-022

Roles

Action	Role	Date
Produce	Airspace Change Team UAS CDC	16 September 2024
Review	DAATM	18 September 2024
Approve	Change Sponsor, RAF AIR Cap	19 September 2024

Drafting and Publication History

Issue	Change Summary	Date
V1.0	Initial Issue	20 September 2024

Contents

References

A	ACP-2023-022 Statement of Need V2.0 (Stage 1, Nov 2023)
B	ACP-2023-022 Full Options Appraisal V1.4 (Stage 3, Jun 2024)
C	ACP-2023-022 Airspace Change Design Options and Design Principles Evaluation V1.0 (Stage 2, Apr 2024)
D	ACP-2023-022 Consultation Report V.10 (Stage 3, Sep 2024)
E	ACP-2023-022 Raw Email Evidence (Stage 3, Sep 2024)
F	ACP-2023-022 Step 1B Design Principles and Stakeholder Engagement (Stage 1, 8 Feb 2024)
G	SARG Policy 133:Policy for the Establishment and Operation of Special Use Airspace (12 Feb 2024)
H	ACP-2023-022_Categorisation_Rationale_V1.0

List of Supplementary Documents

1. AeroData_ACP-2023-022-V1.0

Glossary

Term	Definition
AAL	Above Aerodrome Level
ACP	Airspace change Process
AIP	Aeronautical Information Publication
AIS	Aeronautical Information Service
AISA	Airspace Integration Safety Argument
AMS	Airspace Modernisation Strategy
ANSP	Air Navigation Services Provider
AONB	Area of Outstanding Natural Beauty
ARP	Aerodrome Reference Point
AS	Air System
ATC	Air Traffic Control
ATCO	Air Traffic Control Officer
ATS	Air Traffic Service
ATZ	Aerodrome Traffic Zone
BVLOS	Beyond Visual Line of Sight
CAA	Civilian Aviation Authority
CAP	Civilian Aviation Publication
CAS	Controlled Airspace
CAS-T	Temporary class D Controlled Airspace
CMATZ	Combined Military Aerodrome Traffic Zone
CTA	Control Area
CTR	Control Zone
DA	Danger Area
DAA	Detect And Avoid
DP	Design Principle(s)
EAAA	East Anglia Air Ambulance
EAAUWG	East Anglia Airspace Users Working Group
EAMTA	East Anglia Military Training Area
FL	Flight Level
FUA	Flexible Use of Airspace
FW	Fixed Wing
GA	General Aviation
HEMS	Helicopter Emergency Medical Service
ISD	In-Service Date
JFAC	Joint Forces Air Command
LARS	Lower Airspace Radar Service
LOA	Letter of Agreement
MAA	Military Aviation Authority
MATZ	Military Aerodrome Traffic Zone
MOB	Main Operating Base
MOD	Ministry of Defence
MRP	MAA Regulatory Publications
NAL	Norwich Airport
NATS	National Air Traffic Services
NOTAM	Notice to Aviation
PD	Practice Diversion
RA	Regulatory Article
RAF	Royal Air Force
RPAS	Remotely Piloted Air System
RW	Rotary Wing
SON	Statement of Need

SUACS	Special Use Airspace Crossing Service
TACAN	Tactical Air Navigation
TATCC	Terminal Air Traffic Control Centre
TCAS	Traffic Collision Avoidance System
T&E	Test And Evaluation
TRA	Temporary Reserved Area
UAS	Unmanned Air System
UAV	Unmanned Air Vehicle
USAF	United States Air Force
USAFE	Unites States Air Force in Europe
VFR	Visual Flight Rules
VVIP	Very Very Important Personal

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Introduction

This document forms part of Stage 4 of the Airspace Change Proposal (ACP) ACP-2023-022 and has been prepared in accordance with Civil Aviation Publication (CAP) 1616.

Protector RG Mk1

The main operating base (MOB) for the large Remotely Piloted Air System (RPAS), Protector RG Mk1 is RAF Waddington, where permanent segregated airspace in the form of a Danger Area (DA) has already been established. This is EGD324 and was implemented at the end of Nov 2023. Routine Protector operation commenced from RAF Waddington in September 2024[1], during which the Ministry of Defence (MOD) will conduct test and evaluation (T&E) activities prior to Protector formally entering into service. For this, and for future activity in the UK, Protector will require a nominated permanent diversion airfield to be made available in the event that, for any unforeseen reason, RAF Waddington becomes unavailable. Following investigation into several military airfields, RAF Marham was identified as the most suitable and preferred diversion airfield. Access to RAF Marham as a nominated diversion airfield for T&E has been managed under an airspace trial[2]. The ACP has been recently approved by the Civil Aviation Authority (CAA) and will enable an airspace trial to take place within a Temporary Danger Area (TDA) to test the procedures at RAF Marham.

This ACP seeks to establish permanent airspace to enable Protector RG Mk1 safe and efficient access to RAF Marham as a nominated diversion airfield. The MOD, and specifically Air Capability, is the Change Sponsor for this proposal (identification number ACP-2023-022).

Commencing in June 2023, this proposal followed the Airspace Change Process (ACP) CAP 1616 V4.0 as a Level M1[3] due to the anticipated alteration of civil aviation traffic patterns below 7,000 feet (FT) over an inhabited area. The ACP was transferred to a Level 1[4] with effect from 2 January 2024 and followed process requirements as set out in CAP 1616 Version 5, shown at Figure 1, on passing the Stage 1 Gateway**.**

[1] Routine flying has been delayed from the anticipated start of summer 2024, as stated at Stage 3 of the ACP

[2] See ACP-2023-047 on the CAA ACP Portal) here: Airspace change proposal public view (caa.co.uk)

[3] A Level M1 ACP refers to changes to notified airspace design by the Ministry of Defence where an anticipated consequence is an alteration of civil aviation traffic patterns below 7,000 feet over an inhabited area. Source: CAP 1616 V4.0

[4] A Level 1 ACP has the potential to alter flight behaviours below 7,000 feet (above mean sea level) over land. Source: CAP 1616 V5.0

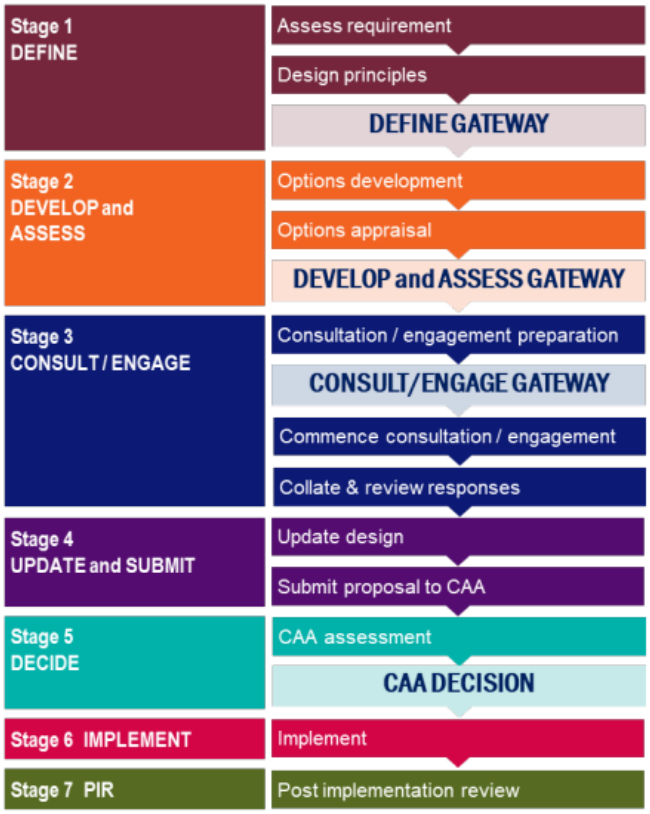

Figure 1: Overview of the airspace change process (Source: CAP 1616, p23)

Section 1

Executive Summary

1 The Drivers for Change

1.1 The Military Aviation Authority (MAA) regulates UK military aviation. 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 only be conducted if:

- An appropriately approved Detect and Avoid (DAA) capability enables compliance with Rules of the Air appropriate to the class of airspace, or;
- They are flown using a Layered Safety Approach that specifically requires flight in Segregated Airspace, or in Controlled Airspace (Classes A-D) with the informed consent of the Air Navigation Services Provider (ANSP).

1.2 When Protector initially comes into service, it will be fitted with a limited DAA capability only and, since RAF Marham is located entirely within Class G airspace, flight in segregated or controlled airspace is required.

2 Statement of Need

2.1 Version 2.0 of the Statement of Need (SON) can be viewed at Ref A and via the CAA ACP Portal[5]. It states the objective of the proposed change is to establish suitable airspace enabling safe and efficient access to a nominated diversion airfield for the BVLOS RPAS, Protector.

3 Aims of the Proposal

3.1 The aim of ACP-2023-022 is to establish a form of segregated airspace to enable Protector RPAS safe access to RAF Marham as its nominated diversion airfield.

3.2 During Stage 1 of this ACP (Jan 2024) the MOD engaged with comprehensive list of stakeholders to develop a set of airspace Design Principles (DPs). Table 1 shows the final set of DPs for ACP-2023-022.

Table 1: ACP-2023-022 Design Principles		
Priority	Ref	Design Principle
1	DP1	The airspace change proposal must maintain a high standard of safety and should seek to enhance levels of safety, wherever possible.
2	DP2	The airspace provides access to a sufficient area to meet operational and training objectives.
3	DP5	The airspace change proposal should not be inconsistent with relevant legislation, the CAA's airspace modernisation strategy or Secretary of State and CAA's policy and guidance.
4	DP3	The airspace design should endeavour to maximise accessibility for other airspace users.

[5] The SON can be found on the CAA ACP Portal here: https://airspacechange.caa.co.uk/documents/download/6230

Table 1: ACP-2023-022 Design Principles		
Priority	Ref	Design Principle
	DP4	The airspace change proposal should consider the impacts on all airspace users.

3.3 Implementation of the final design satisfies the objective with all design principles being fully met. This will permit Protector to access RAF Marham in a safe environment, maintain regulatory compliance, and provide protection of other airspace users of any associated and identified hazardous activities.

4 Assumptions and Constraints

4.1 The following assumptions were identified at the beginning of the proposal, or have developed throughout the process:

- 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.
- Specific Letters of Agreement (LOA) will be in place to reduce the impact on other airspace users (including East Winch and Broughton (North and South) private landing strips.
- An en-route LOA between National Air Traffic Service (NATS), 78 Sqn (Swanwick Military ATC) and the air system operators will be in place for the management of Protector activity during transit to/from, and for egress/ingress of the DA.
- A terminal LOA will be in place to define the procedures to be applied between Aerodromes, ANSPs and air system operators to facilitate support to Protector Operations.
- The MOD will manage their own procedures and personnel by means of update to internal policy and procedures.
- Procedures agreed with NATS meet with the approval of the CAA to support the claim that the airspace status complies with the criteria laid down in Ref G.

4.2 The following constraints were derived by the Change Sponsor:

- Air systems without communication equipment are likely to be unable to enter a DA, as they would not be able to receive a Special Use Airspace Crossing Service (SUACS).

5 Summary Description of the Current Airspace and Operation

5.1 RAF Marham is situated in the East of England, approximately 40 miles West of the city of Norwich. A map of the area affected can be found at Figure 2 below.

Figure 2: RAF Marham Local Area. Source: Aeronautical Chart ICAO 1:500,000, Sheet 2171CD Southern England and Wales, Edition 50, 21 Mar 2024

5.2 The airfield sits within class G airspace up to Flight Level FL195; Class C airspace extends upwards from FL195. RAF Marham Air Traffic Zone (ATZ) is a circle 2·5NM radius centred on Marham's aerodrome reference point (ARP), notified from surface to 2000FT Above Aerodrome Level (AAL). The Military Air Traffic Zone (MATZ) is a circle 5NM radius centred on Marham's ARP and is notified from surface to 3000FT AAL

5.3 Home to the F-35 Lightning, aviation activity at RAF Marham consists of visual and instrument circuits at the aerodrome; departures to operate within 30NM for general handling and departures to operate in EGD323 over the North Sea. RAF Marham also accommodates a small aero club and model-flying club. The airfield hosts numerous practice diversions (PDs) throughout the day, mainly from RAF Lakenheath, RAF Barkston Heath and RAF Cranwell, averaging 4 – 5 PDs per day.

5.4 The local area is populated by numerous civil airfields and airstrips supporting leisure flying (general aviation (GA), gliding, paragliding and parachute activity). Of note are East Winch and Broughton (North and South) private landing strips, all of which are within the RAF Marham MATZ.

5.5 The airspace surrounding Marham benefits from air traffic services provided by several military and civilian ATC units with good coverage under the Lower Airspace Radar Services (LARS) network.

5.6 A detailed description of the current airspace and operations can be found at paragraph 12 and at Appendix A of Ref B.

6 Summary Description of the Changes to Airspace Design and Operation

6.1 The final design proposed is shown at Figure 3. It consists of one construct comprising two volumes of vertically joined airspace within, both of 5NM radius centred on RAF Marham's ARP.

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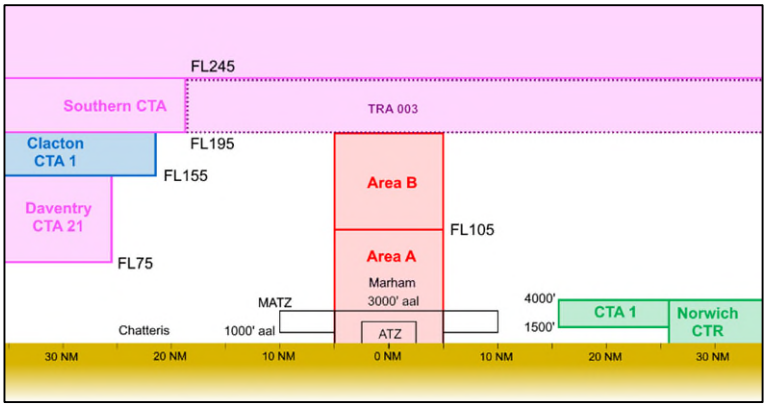
Source: Aeronautical Chart ICAO 1:500,000, Sheet 2171CD Southern England and Wales, Ed 50</td>
<td> 

SW/NE Cross-section (Areas A & B)</td>
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<tr>
<td>Lateral Dimension: 5NM radius circle centred on RAF Marham's ARP</td>
<td>Vertical Dimension:
Area A Surface to FL105
Area B FL105 - FL195.</td>
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</table>

Figure 3 Final Airspace Design Proposal

6.2 The overall volume of airspace is in the form of a cylinder from Surface to FL195; an internal division at FL105 is incorporated within the cylinder, thereby splitting the airspace into two sections, namely Area A (lower) and Area B (upper). This is to facilitate more expeditious air traffic management. When Protector is not within an area, air systems may be permitted to enter the airspace. Apart from reasons of routine air traffic safety and co-ordination, air systems would only be prevented from accessing either area when Protector is in (or about to enter) either section. It is thought that this will reduce holding times and thereby promote Flexible Use of Airspace (FUA) for all local airspace users (civil and military).

6.3 The Change Sponsor proposes to implement the required segregation in the form of a DA, which will provide the most efficient and tactical use of airspace. The MOD will activate the airspace structures only as and when necessary.

6.4 Procedures will be adopted to activate and notify the airspace by the appropriate Notice To Aviation (NOTAM) action being taken at D-1[6]. To ensure minimum disruption to other airspace users a SUACS will be offered within the implemented airspace; if the airspace has been notified as being active, it may be possible for both civil and military aircraft to transit through it when not occupied by Protector, under a clearance from the relevant military ATC unit.

7 Summary of Options Analysis

7.1 The Change Sponsor presented two airspace design options upon which it invited feedback and comment from a range of stakeholders. To enable comparison against the impacts of the proposed design options, feedback on the suitability of two baseline scenarios was also invited; one for the year of implementation without the airspace, and one based on ten years after implementation without the airspace change.

[6] D-1 means that the NOTAM must be requested the day before the airspace is to be activated.

7.2 During the design principle evaluation in Stage 2 Ref C, the baseline scenario did not meet the Statement of Need or Design Principle 2 (The airspace provides access to a sufficient area to meet operational and training objectives) and therefore would severely limit Protector's UK training and operational activity. Option 1 was evaluated as only partially meeting Design Principle (DP) 3, which is "The airspace design should endeavour to maximise accessibility for other airspace users". Option 2 met DP3 (via the addition of a vertical division in the airspace design) and all other DPs.

7.3 Based on stakeholder feedback and design principle evaluation, the Change Sponsor discounted Option 1 and took only Option 2 through to Stage 3 of the process. Development of the Options Appraisal for design Option 2 and the baseline scenarios continued though Stage 3, using a qualitative assessment against the high-level objectives and criteria laid out in CAP 1616f. The assessment conduced at Stage 3 can be found at Ref B.

7.4 The single airspace design Option 2 remained unchanged following Options Appraisal and is the only design option that meets the SON and all of the Design Principles; therefore, this is the Change Sponsor's final design.

8 Summary of Engagement and Consultation

8.1 The area potentially affected by this ACP and that for the airspace trial under ACP-2023-047 are the same; therefore, stakeholders previously engaged for the airspace trial were included in all engagement activity. A refresh of the stakeholder lists was managed by the Change Sponsor to identify any changes in personnel in organisational posts and to include local authorities and other entities potentially affected. A complete list of stakeholders can be found at Ref D.

8.2 Engagement for ACP-2023-022 commenced in December 2023 and concluded in July 2024. A chronology of engagement activity is at Table 2.

Table 2 Chronology of ACP-2023-022 Engagement

Date	Event	Method	Notes
2 Jan 2024	Stage 1 Define	Stage 1 engagement material sent to all stakeholders.	The engagement material and feedback received can be viewed at Appendix C of Ref F.
16 Jan 2024		Presentation delivered at East Anglia Airspace Users Working Group (EAAUWG).	Minutes of the EAAUWG can be viewed at Appendix B of Ref F.
25 Jan 2024		Reminder of deadline for Stage 1 feedback sent to stakeholders, prompting those yet to submit their feedback.	The engagement material and feedback received can be viewed at Appendix F of Ref C.
4 Mar 2024	Stage 2 Develop and Assess	Stage 2 Engagement material sent to all stakeholders.	The engagement material and feedback received can be viewed at Appendix C of Ref C.
21 Mar 2024		Reminder of deadline for Stage 2 feedback sent to stakeholders, prompting those yet to submit their feedback.	The email distributed to all stakeholders can be viewed at Appendix C of Ref C.
11 Jun 2024	Stage 3 Consultation	Stage 3 Consultation Launch: material sent to all stakeholders.	The engagement material can be viewed at Ref E.
13 Jun 2024		Presentation delivered at EAAUWG.	Minutes of the EAAUWG can be viewed at Appendix E of Ref D.

Table 2 Chronology of ACP-2023-022 Engagement			
Date	Event	Method	Notes
5 Jul 2024		Reminder of deadline for Stage 3 feedback sent to stakeholders, prompting those yet to submit their feedback.	The email distributed to all stakeholders can be viewed at Ref E.
11 Jul 2024		Reminder of public drop-in Webinar sent to stakeholders.	The email distributed to all stakeholders can be viewed at Ref E.
11 Jul 2024		Public Drop-in Webinar event held on Microsoft Teams.	The presentation delivered during the Webinar can be found at Appendix D of Ref D.
17 Jul 2024		Consultation ends.	Rationale for selecting the final design following stakeholder feedback can be viewed at Ref H.

8.3 As referenced in paragraph 7, based on the DP Evaluation and stakeholder feedback received at Stage 2, the Change Sponsor elected to discount design Option 1 and only design Option 2 taken through to Stage 3 Consultation. Ref C contains full details of the rationale for selecting the design option.

8.4 Supplementary information was obtained after Stage 2regarding the anticipated tempo of operations for Protector, which was included with Consultation material at Stage 3, Consultation.

8.5 Consultation on design Option 2 ran for seven weeks. Thirteen stakeholders responded to the Consultation, which is an indication of the extensive previous engagement conducted six months prior, for the trial airspace of the same design construct and management procedures under ACP-2023-047. Seven stakeholders were in support of the proposal; six were unsure or did not state a preference. No stakeholders objected to the proposal during Consultation. Prominent themes observed during combined engagement activity were:

- Access to the DA, and;
- The designated separation level within the airspace construct.

8.6 Following categorisation of all feedback, which can be found at Refs E and H, the Change Sponsor concluded consequential adaptations to the final design were not required.

9 Summary of Anticipated Impacts

9.1 The anticipated impacts from ACP-2023-022 are presented at Table 3, below. The impact of this ACP on military activity is being managed internally and has, therefore, not been included in this table. A comprehensive rationalisation of the anticipated impacts of the ACP can be found at Section 2, Paragraph 20.

Table 3: Summary of Anticipated Impacts	
Group	Impact
Airspace User: General Aviation	- Small impact on ease of access to the DA, in line with forecast civilian and military traffic levels only. - Air systems without communication equipment are likely to be unable to enter the DA, as they would not be able to receive a SUACS. - Potential small increase in fuel burn in line with forecast air traffic levels, if aircraft do not / cannot take advantage of SUACS to achieve a direct routing.

Table 3: Summary of Anticipated Impacts	
Group	Impact
Airspace User: Commercial Airlines	- No perceived impact.
Service Provider: Airport /ANSP	- No infrastructure, deployment or other costs will be imposed. Local agreements have been drafted to co-ordinate military and civil activities. See Appendices A to C.
Safety Considerations	- Pilots being initially unaware of new airspace. - Re-route through unfamiliar areas. - Potential funnelling as a result of need to re-route.
Efficient Use of Airspace	- The DA will only be activated for the duration of Protector sorties (likely to mirror the activation periods of the airspace implemented at RAF Waddington (EGD324). Utilisation of the DA by Protector will be infrequent, for a maximum of approximately 20 minutes during each departure or recovery phase.
Expeditious flow of traffic	- Negligible impact to flow of traffic due to infrequent utilisation of the DA by Protector. Access will be maximised when the DA is active but not occupied by Protector, by provision of a crossing service (e.g. SUACS). - Air systems without communication equipment will be required to re-route or hold outside the DA when active.
Communities	- Negligible impact on local air quality or noise.
Spaceflight Activities	- No perceived impact.
Environmental	- Negligible impact to greenhouse gas emissions, tranquillity, or biodiversity.
National Security	- No perceived impact.

10 Assessment of criteria for the Secretary of State for Transport's Call-in Process

10.1 As the Change Sponsor is the MOD, this section is not applicable to this ACP.

11 Timeline for implementation

11.1 The main activities to be completed prior to implementation of the DA are provided at Table 4.

11.2 Accurate climb and descent rates for Protector were to be collected via the airspace trial at RAF Marham scheduled for Summer 2024. This would determine potential airspace utilisation periods, together with any other information that could inform the development of this ACP. At time of writing, the trial had yet to commence, but is anticipated to occur September to December 2024. Additional actions may emerge as a result of the trial, but cannot be identified prior to final submission of this ACP.

Table 4: Post-Consultation steps for ACP-2023-022		
Date	Activity	Detail
20 September 2024	Stage 4 - Update and Submit	Upload ACP final submission to the CAA ACP Portal
13 January 2025	Stage 5 - Decide	CAA decision
17 January 2025	AIP Cut-off Date	To meet AIRAC 04/2025
6 March 2025	AIP Publication Date	AIRAC 04/2025

Table 4: Post-Consultation steps for ACP-2023-022		
Date	Activity	Detail
Prior to 17 April 2025	Implementation of all LOAS	See Paragraph 4.1 and Appendices A to E.
17 April 2025	Stage 6 - Implement	Airspace implemented
12 months post-implementation	Stage 7 – Post Implementation Review	Assessment of the effectiveness and usage of any implemented airspace

Section 2

Detailed Description of the Proposal and Impacts

12 Detailed Description of the Current Airspace and Operations

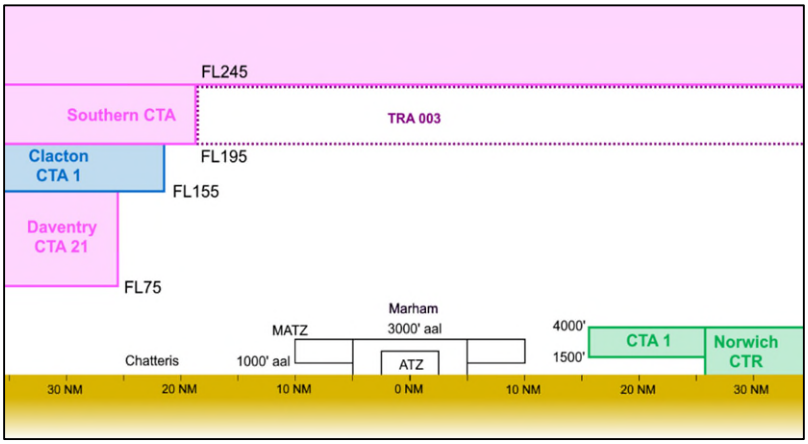
12.1 A full description of the current airspace and usage is at paragraphs 12.1.1 to 12.1.9. This information was presented at Stage 3 of the process and can be found at Appendix A of Ref B.

12.1.1 RAF Marham ATZ is a circle 2·5 nm radius centred on Marham's ARP, notified from surface to 2000ft AAL. The MATZ is a circle 5 nm radius centred on Marham's ARP and is notified from surface to 3000ft AAL. Pilots must call Marham Zone on frequency to obtain permission to enter the ATZ. No reply on the Zone frequency will indicate that Marham MATZ can be crossed but pilots must continue to avoid the ATZ unless operating in accordance with previously agreed procedures. Marham Zone is activated in order to protect operational flying and so aligns with its military flying requirements; all opening hours are routinely promulgated via a NOTAM.

12.1.2 To the East of RAF Marham by approximately 20 NM is Norwich Airport (NAL), surrounded by a Control Zone (CTR) and a Control Area (CTA), both up to 4000ft. An LOA is in place to facilitate safe ATC service to traffic to and from NAL and air systems operating under the control of RAF Marham.

12.1.3 Directly above and surrounding RAF Marham the airspace is Class G up to Flight Level FL195; Class C extends from FL195 upwards. During specified hours, the airspace is activated as a Temporary Reserved Area (TRA 003). Although the background classification between FL195 and FL245 is Class C, to avoid operational restrictions, military air systems may operate autonomously or in be receipt of an air traffic service (when not occupied by Unmanned Air Vehicles (UAV)). MOD and United States Air Force (USAF) air systems are the predominant users but use of the TRA is not restricted to military users. Above the TRA is the East Anglia Military Training Area (EAMTA), FL245 to FL660. A diagram of the local airspace cross section is at Figure 4.

Source: Aeronautical Chart ICAO 1:500,000, Sheet 2171CD Southern England and Wales, Ed 50



Cross-section Diagram of RAF Marham Local Airspace

Figure 4: RAF Marham Local Area and Local Airspace Cross Section. Source: Aeronautical Chart ICAO 1:500,000, Sheet 2171CD Southern England and Wales, Edition 50, 21 Mar 2024

12.1.4 Home to the F-35 Lightning, aviation activity at RAF Marham consists of visual and instrument circuits at the aerodrome; departures to operate within 30NM for general handling and departures to operate in EGD323 over the North Sea. RAF Marham also accommodates a small

aero club and model-flying club. The airfield hosts numerous PDs throughout the day, mainly from RAF Lakenheath, RAF Barkston Heath and RAF Cranwell, averaging 4 – 5 PDs per day. The airspace directly surrounding and overhead RAF Marham is used by fast jets for training up to FL245 by RAF Coningsby, RAF Lakenheath and RAF Marham airspace users, who conduct general-handling and air combat training, as well as simulated surface attack in vicinity of RAF Marham. On a daily basis Lakenheath departures and arrivals route through the Marham overhead to/from the D323 complex; departures from Lakenheath over fly the edge of the RAF Marham western MATZ stub and aircraft returning under VFR over fly the central MATZ. The vast majority of Mildenhall departures transit in the vicinity of Marham due to the TACAN provision.

12.2 NAL, serves circa 2700 aircraft movements annually, including scheduled and charter aircraft as well as offshore oil/gas/wind farm transportation. The CTA and CTR do not impact the RAF Marham MATZ.

12.3 The local area is populated by numerous civil airfields and airstrips supporting leisure flying (general aviation, gliding, paragliding and parachute activity). Of note are East Winch and Broughton (North and South) private landing strips, all of which are within the RAF Marham MATZ. LOAs have agreed with these airfields, in addition to agreements with Rookery Farm, Great Massingham and Southery Airfields, which are situated in the local vicinity.

12.4 The East Anglia Air Ambulance (EAAA) from both Cambridge and Norwich operate in the local area and require occasional access to cross the RAF Marham ATZ/MATZ at short notice in response to Helicopter Emergency Medical Service (HEMS) tasking.

12.5 RAF Marham is frequently used for both FW and RW VVIP movements, military and private. VVIP FW movements require the establishment of CAS-T.

12.6 Gliding activity generally takes place to the west and south of RAF Marham and is predominantly up to 4000FT. When the weather conditions are suitable, gliders also frequently cross to the north and east of Marham.

12.7 Whilst the MATZ is not a mandatory avoid for civil pilots, the majority of civil pilots call RAF Marham ATC when flying in proximity to the aerodrome and when requiring to transit within 5 M of RAF Marham. A qualitative assessment was obtained from Marham ATC regarding the number of requests from civil airspace users to cross overhead RAF Marham (both inside and outside the MATZ). On an average day, RAF Marham ATC estimates that it will receive around 20 requests for MATZ and overhead crossings from GA aircraft (both leisure and sporting) passing within 5 M overhead and operating below 7000 FT AAL. This may peak to the high 20s on the busiest flying days, but is estimated to be less than 30 on any given day. Supporting quantitative evidence has also been obtained from RAF Marham ATC in the form of a monthly breakdown of MATZ crossing requests for the 12 months Oct 2022 – Sep 2023 (inclusive). The figures are provided in Table 5, below. Since Marham ATC does not routinely operate at weekends the figures apply to requests for Monday to Friday only and no further granularity is available.

Table 5: MATZ Crossers Oct 2022 to Sep 2023

Month	Number of MATZ Xers
October 22	48
November 22	41
December 22	14
January 23	32
February 23	33
March 23	71
April 23	73
May 23	36
June 23	83

Table 5: MATZ Crossers Oct 2022 to Sep 2023	
Month	Number of MATZ Xers
July 23	46
August 23	57
September 23	54

12.8 Approximately 10 civilian aircraft per day transit the RAF Marham overhead, above the MATZ. In addition, it is estimated that 50-60 military aircraft also pass overhead. Predominantly from RAF Lakenheath, the aircraft depart heading 240° for 3NM, then turn to the NE to pass over RAF Marham above FL70.

12.9 The airspace surrounding Marham benefits from air traffic services provided by several military and civilian ATC units with good coverage under the LARS network. Aircraft operating in the vicinity RAF Marham who wish to obtain an air traffic service typically receive a LARS from either RAF Marham or NAL. The Change Sponsor is not aware of any particular issues regarding operational delays or choke points which should be considered.

13 Detailed Description of Changes to Airspace Design and Operation

13.1 Design.

13.1.1 The final design proposed is shown at Figure 5, below. It consists of one construct comprising two volumes of vertically joined airspace within, both of 5NM radius centred on RAF Marham's ARP.

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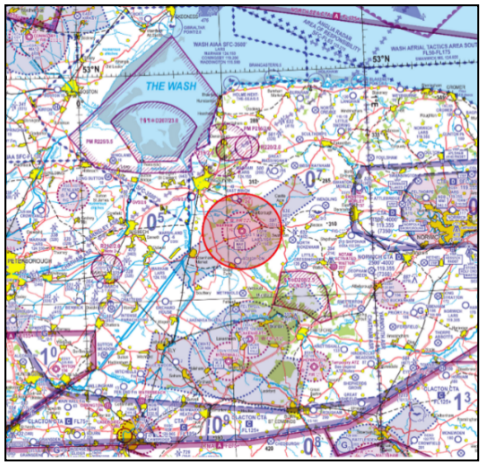
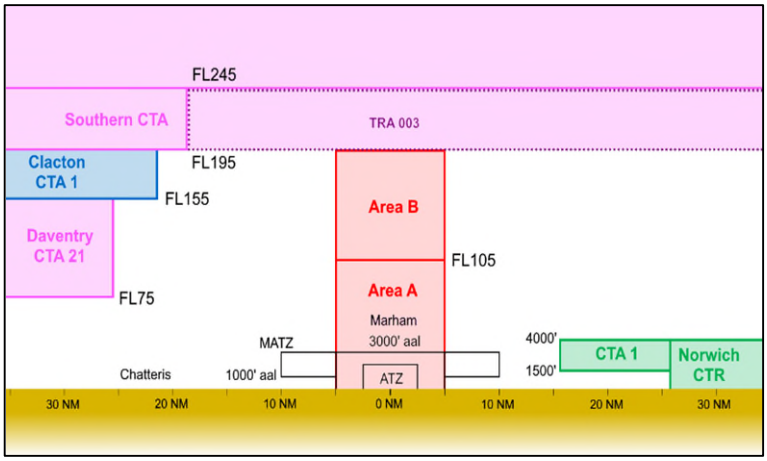
<td> 

Source: Aeronautical Chart ICAO 1:500,000, Sheet 2171CD Southern England and Wales, Ed 50</td>
<td> 

SW/NE Cross-section (Areas A & B)</td>
</tr>
<tr>
<td>Lateral Dimension: 5NM radius circle centred on RAF Marham's ARP</td>
<td>Vertical Dimension:
Area A Surface to FL105
Area B FL105 - FL195.</td>
</tr>
</table>

Figure 5 Final Airspace Design Proposal

13.1.2 As described at paragraph 6, the overall volume of airspace is in the form of a cylinder from Surface to FL195; an internal division at FL105 is incorporated within the cylinder, thereby splitting the airspace into two sections, namely Area A (lower) and Area B (upper).

13.1.3 The purpose of the split is to facilitate more expeditious air traffic management. When Protector is not within an area, the area would be considered ‘active, but with no Protector activity within’ and air systems may be permitted to enter the airspace. Apart from reasons of routine air traffic safety and co-ordination, air systems would only be prevented from accessing either area when Protector is in (or about to enter) either section. It would be inefficient to predefine a specific time period that Protector is considered 'about to enter' the airspace as this is variable, dependent on the priority/performance/intentions of all air systems involved, and would be subject to the coordination of Marham ATC.

13.1.4 The level of the vertical separation has been designated at FL105, taking into account the needs of all airspace users. Consideration was also given to minimising the potential for events caused by the human factors of air system operators, thus the level of split is the same as at EGD324 (Waddington). Other suggestions (at Stage 2) were for the split to be lower (7000ft) for GA traffic, and higher than FL110 to accommodate Practice Flame Out (PFO) procedures by military aircraft. 2 Gp BM Safety confirmed accommodation of the PFO procedures can be achieved irrespective of the A/B FL105 split, through tactical ATC management. When Protector is established in the climb and through FL115, PFOs can be approved to utilise SFC to FL105. This will be captured in RAF Marham ATC Procedures.

13.1.5 The airspace trial under ACP-2023-047 will collect data to determine most effective level for vertical separation of the DA. Should the airspace trial demonstrate FL105 is not the most effective level for vertical separation within the DA, a review may be conducted. However, it should be noted that due to ongoing modifications to the Trial Plan, the data may not be available prior to submission of this ACP. It should also be noted that Protector may be fitted with the full suite of DAA equipment in the long-term, thus potentially enabling a reduction to the upper limit of the airspace and removing the requirement for two separate internal sections.

13.2 Operation.

13.2.1 The MOD will activate the airspace structures only as and when necessary; specifically, only when activity by Protector is planned from either RAF Waddington or RAF Marham itself. Procedures will be adopted to implement appropriate Notice To Aviation (NOTAM) action at D-1.

13.2.2 Protector will occupy the entirety of the airspace construct for a maximum of approximately 20 minutes during each arrival or departure phase. This does not take into account the time taken to exit the runway, only the descent and Automatic Take-off and Landing pattern to touchdown. The air system will remain on the runway for a maximum of 5 minutes (assuming no issues or malfunctions have occurred). Similarly, for take-off, the air system will be stationary on the runway for a maximum of 5 minutes. However, the frequency of movements at Marham means this is likely to have limited impact and can be managed with Protector held in orbit to enable either recoveries or departures.

13.2.3 To ensure minimum disruption to other airspace users a SUACS will be offered within the 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 when not occupied by Protector, under a clearance from the relevant military ATC unit.

13.2.4 The DA at RAF Marham will need to be active for all Protector flying, including sorties from RAF Waddington when planned use of RAF Marham is not expected (i.e. the DA may be active but not necessarily used for access to the diversion airfield, in the event that RAF Waddington becomes unavailable).

13.2.5 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. Within the first 24 months of service, there may be up to two air vehicles in the air simultaneously. Some night flying is expected.

13.2.6 Crews may be required to conduct PDs into RAF Marham for currency. The primary method to maintain currency will be via synthetic means (i.e. flight simulator), but a small element

of live flying is likely to be necessary. A PD will comprise of one arrival and one departure profile only.

13.2.7 Current estimate of live training requirements are:

- Up to 10 live PDs soon after In-Service Date (ISD) is declared.
- An enduring requirement for up to 25 live PDs per financial year for trainee pilots.

13.2.8 SUACS requests will be denied whilst Protector is actually operating within the DA, the potential impact of which is estimated to be less than 1 aircraft during this period[7].

13.2.9 Should Protector activity be cancelled or concluded early, the airspace will be deactivated as soon as practicable.

13.3 Letters of Agreement. The airspace will endeavour to minimise ATC workload and maximise accessibility for other airspace users, to make most efficient use of the proposed segregated airspace. Procedures and LOAs are already established for the trial airspace and are expected to be upheld for this ACP (at Appendices A to E). The MOD is also currently working to engage with Lakenheath in the development of a LOA.

14 Detailed Description of Anticipated Operational Impacts

14.1 An analysis of the impact of the change on all airspace users, airfields and traffic levels is provided at Table 6, including (where relevant) an outline concept of operations describing how operations within the new airspace will be managed. Utilisation of the DA, described at paragraph 13.8, is fundamental to the assessed impact of the DA. It is also important to note that as the Protector Programme progresses, it is anticipated that there would be advances in technology permitting the development and instalment of an appropriate DAA system on the airframe. Should this be the case, then the required airspace would either be significantly reduced or withdrawn.

Table 6: Anticipated Operational Impacts

Ser	Subject	Compliance / Mitigation
a	Impact on the flow of instrument flight rules flights, including general air traffic and operational air traffic.	Negligible impact expected. Availability of a SUACS through the proposed airspace should allow transit through the DA if required. Aircraft without radios will be most affected.
b	Impact on VFR operations.	Negligible impact expected. The SUACS provision during Protector activity will provide airspace users with normal access to the RAF Marham overhead apart from a short period for infrequent Protector departures or arrivals. Aircraft without radios will be most affected.

[7] Further details on the impact analysis can be found at para 1.2 of the Full Options Appraisal at Ref B

Table 6: Anticipated Operational Impacts		
Ser	Subject	Compliance / Mitigation
c	Impact on existing procedures and airspace/airport capacity.	Negligible impact expected on existing procedures and capacity. The airspace will only be inaccessible for a short period for infrequent Protector departures or arrivals.
d	Impact on aerodromes and other aviation activities within or adjacent to the area of the proposed changes.	Local agreements have been drafted to co-ordinate military and civil activities. See Appendices A to E.
e	Flight planning or navigation requirements.	Airspace users planning to transit the proposed airspace when notified as active should plan to obtain a SUACS from the appropriate Military Air Traffic Service (ATS) provider. However, should a SUACS be refused, due to conflicting activity, airspace users must also be prepared to route around/above/below the occupied elements of the DA.
f	Details of any changes to the provision of air traffic services, including justification for any delegation of the provision of air traffic services.	No anticipated changes to provision of civilian ATS. Changes to ATS provided by, or on behalf of the MOD are being managed internally.
g	The impact of the traffic mix on complexity and workload of operations.	No anticipated impact on traffic mix as Protector will be in segregated airspace. There will be no increase in the number of aircraft operating in the local area, nor will the aircraft types be altered. The airspace will only be utilised for a short period for infrequent Protector departures or arrivals. Procedures to enable the maximum flexibility in airspace usage whilst minimising military ATC workload are already established for the trial airspace and are expected to be upheld for this ACP. Procedures and LOAs can be found at Appendices A to E.

Table 6: Anticipated Operational Impacts		
Ser	Subject	Compliance / Mitigation
h	Consideration of access requirements of other airspace users in accordance with the type and classification of airspace structure, including details on the ability to support the provision of air traffic services in accordance with the nature of the operation and the classification of airspace.	To ensure minimum disruption to other airspace users a SUACS will be offered within the 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 the appropriate military ATS provider. Information on the status of the airspace will be available, including a Special Use Airspace Activity Information Service (SUAAIS) via RAF Marham ATC or other appropriate military ATC units.
i	Consideration of how connectivity to/from the air traffic service network is to be achieved, including arrangements for aerodromes outside controlled airspace.	Class C extends directly above the DA from FL195 upwards. During specified hours, the airspace is activated as a Temporary Reserved Area (TRA 003). A cross-section diagram of the local airspace is at Figure 4. Protector will utilise Class C/ TRA 003 for egress/ingress of the DA. An en-route LOA NATS, 78 Sqn (Swanwick Military ATC) and the air system operators will be in place for the management of Protector activity during transit to/from, and for egress/ingress of the DA (Appendices D and E).

15 Supporting Infrastructure and Resilience

15.1 There are no infrastructure or real estate amendments required to support this ACP, or Protector operations at RAF Marham. Protector will utilise extant systems and processes as detailed in MOD Station//Group Orders and LoAs.

15.2 Following a lost link (LL) event, Protector will transmit 7400 on Mode A iaw the Civilian Aeronautical Information Publication (AIP) ENR 1.6. The pilot will establish alternate communication with ATC to confirm LL for onward transmission to affected air systems. The air system will continue iaw its pre-programmed lost link mission (e.g., 30min hold and proceed en-route, or return to base). Should the link be restored, tactical control of the air system may resume and normal ATC procedures will be recommenced. The procedure does not impact the final airspace design. Procedures for LL are defined in Appendices D and E.

15.3 Appropriate military ATC agencies must be available to provide a SUACS throughout hours of activation of the DA. If not, the airspace will be deactivated. The likelihood of equipment failure at the military ATC facilities is thought to be very low; the Lincolnshire Terminal Air Traffic Control Centre (TATCC) and Swanwick Military ATC operate from multiple selectable primary radars, which provide adequate redundancy. In addition, the WAM installation provides increased resilience for the provision of secondary radar cover.

16 Regulations, Policies and Harmonisation

16.1 Airspace Modernisation Strategy (AMS). This proposal does not form part of the Airspace Modernisation Strategy. This ACP does not aim to solve the strategic issue of RPAS integration within UK airspace, nor does it seek to 'invent' anything novel. In order to comply with current policy a Danger Area is the most recognised method of achieving segregated airspace for operating RPAS

in the UK. Future airspace modernisation may negate the requirement for segregated airspace or introduce alternative methods of segregating RPAS in future at which point this airspace structure will no longer be required for the Protector activity.

16.2 It is proposed the DA status complies with the CAA's safety buffer criteria laid down in Ref G. The airspace is vertically adjacent to Class C airspace but a buffer is not required. For EGD324 (RAF Waddington) and for the airspace trial (RAF Marham), the MOD has agreed procedures in place with NATS, which the CAA has approved. A similar process will be managed for this airspace change to facilitate an agreement between MOD and NATS to confirm that no additional buffer is required. This will be presented to the CAA prior to airspace implementation.

17 Safety

17.1 A safety assessment was presented with the Stage 2 Initial Options Appraisal and key elements are repeated here since it has not been necessary to develop the assessment further.

17.2 In accordance with MRPs (see paragraph 1.3), the MOD is producing an Airspace Integration Safety Argument (AISA) for the introduction of Protector into UK airspace. This work will evidence the argument for the safe operation of Protector under an air traffic service within transponder-mandatory airspace, as well as in suitable segregated airspace. Protector is fitted with a Traffic Alert and Collision Avoidance System (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).

17.3 Reference to open-source flight data and from Marham ATC indicates that some very minor funnelling takes place between the RAF Marham MATZ and EGD208 (Stanford) at levels up to FL100. Since the proposed airspace has the same lateral footprint as the MATZ, it is appropriate to conclude that some pilots might still choose to avoid the DA rather than call for a SUACS, which could add to the existing funnelling. Taking into account the low numbers of MATZ and overhead crossers even on the busiest flying days, the Change Sponsor assesses that even if a small percentage of pilots chose to avoid the DA, there would be a negligible increase to the funnelling of traffic.

17.4 As stated within Table 6, there will be no increase in the number of aircraft operating in the local area, nor will the aircraft types be altered. The airspace will only be utilised for a short period for infrequent Protector departures or arrivals. Procedures to enable the maximum flexibility in airspace usage whilst minimising military ATC workload are already established for the trial airspace and are expected to be upheld for this ACP. Procedures and LOAs can be found at Appendices D and E.

17.5 Paragraph 15.2 proposes compliance with the CAA Safety Buffer Policy laid down in Ref G. An agreement between MOD and NATS to confirm that no additional buffer is required will be presented to the CAA for approval prior to airspace implementation.

18 Environmental Assessment

18.1 The ACP Change Sponsor is the MOD and is, therefore, only responsible for assessing the consequential environmental impact of MOD's operations on civil air traffic[8]. For this reason, the Change Sponsor has not considered the environmental impact of Protector activity specifically in conjunction with this ACP. The full environmental assessment can be found on the CAA ACP Portal[9]

[8] CAP 1616i Environmental Assessment Requirements refers.

[9] The environmental assessment can be found at Appendix A of the Full Options Appraisal on the CAA Portal here: Airspace change proposal public view (caa.co.uk)

18.2 In summary, it has been assessed that the airspace design proposed will have a negligible impact on the following:

18.3 Noise. The Change Sponsor has assessed that the proposed change will not result in an increase in the number of air systems operating in the local area. Therefore, the same amount and type of noise is likely to impact the local population as is currently the case. Since the change is likely to impact less than 30 air systems on the busiest flying day, and considering the mitigations put in place (e.g. NOTAM, SUACS), the overall impact of the proposed change on noise is assessed to be negligible.

18.4 Greenhouse Gas Emissions and Fuel Burn. The Change Sponsor has considered the impact of the proposed airspace on CO_2 emissions and fuel burn from a qualitative point of view and suggests that the proposed change will not result in an increase in the number of air systems operating in the local area, nor will the air system types be altered. Therefore, whilst there might be a small number of air systems that do not take advantage of the SUACS in order to get a direct routing, the impact on greenhouse gas emissions and fuel burn is assessed to be negligible.

18.5 Tranquillity and Biodiversity. The proposed airspace does not sit above any Areas of Outstanding Natural Beauty (AONB) or National Parks. There are five European sites[10] within 18KM of the runway at RAF Marham[11]. It is anticipated that GA air systems will continue to request and obtain a SUACS to cross the airspace in their current manner, with only a small percentage of them requiring a reroute due to activity within the segregated airspace. This small percentage may result in an interaction with some sensitive areas but the numbers are thought to be so small that the Change Sponsor considered a formal assessment would be disproportionate to the numbers of air systems affected.

19 Habitats Regulations Assessment.

19.1 In accordance with CAP 1616i Environmental Assessment Requirements, Change Sponsors must consider the potential biodiversity implications associated with airspace design options. By completing a habitats regulations assessment early screening criteria form, the Change Sponsor scoped out the requirement for a full Habitats Assessment at Stage 2 of the ACP.

[10] European sites are Special Protection Areas and Special Areas of Conservation designated to protect their biodiversity. Source: European leaflet Natura 2000.pdf (defra.gov.uk)

[11] The zone of influence for potential impacts on European sites relates to flights at an altitude of 3,000 feet and below, and within 18 kilometres of a runway end. Source: CAP 1616i, Environmental Assessment Requirements and Guidance for ACPs. Para 9.10

20 Final Options Appraisal

Table 7 – Summary of options appraisal: Option 2 (at years 1 and 10) and baseline scenarios					
Group	Impact	Option 2: Year 1	Option 2: Year 10	Baseline + 1 Year	Baseline + 10 years
Communities	Noise	**Civil aircraft:** The mechanism for crossing the airspace associated with this option (SUACS) would be very similar to that of crossing the MATZ. Option 2 has the same lateral footprint as the extant MATZ at RAF Marham. Vertically, Option 2 provides flexibility in facilitating transit within 5NM of RAF Marham through the split of the proposed airspace into 2 areas, thus reducing changes to noise levels as a result of re-routing/holding outside the proposed airspace. Therefore, noise levels are expected to remain unchanged and it is considered that Any consequential impact on noise from this option is negligible compared to the impact of baseline scenarios.	**Civil aircraft:** The mechanism for crossing the airspace associated with this option (SUACS) would be very similar to that of crossing the MATZ. Option 2 has the same lateral footprint as the extant MATZ at RAF Marham. Vertically, Option 2 provides flexibility in facilitating transit within 5NM of RAF Marham through the split of the proposed airspace into 2 areas, thus reducing changes to noise levels as a result of re-routing/holding outside the proposed airspace. Therefore, noise levels are expected to change in line with forecast civilian and military traffic levels only. Any consequential impact on noise from this option is negligible compared to the impact of baseline scenarios due to infrequent utilisation of the airspace by Protector. There is intention for Protector to be equipped with a fully certified DAA	No impact on noise within communities since: Protector would be unable to operate without Option 2. Therefore, airspace and associated activity would remain unchanged. Most civil and military pilots would carry on as they do now – ATZ and MATZ would still be in existence. There is the likelihood that some rerouting already occurs below 3000FT AAL, which is unlikely to change under this scenario. There is no anticipated change in the number of civil aircraft operating in the local area, nor will the aircraft types be altered.	Protector would be unable to operate without Option 2. Therefore, any change to noise levels is expected to be in line with forecast civilian and military traffic levels only. Most civil and military pilots would carry on as they do now. Whilst there may be a change to airspace in the vicinity of military aerodromes in the future, it is best to assume that ATZ and MATZ would still be in existence. There is the likelihood that some rerouting already occurs below 3000FT AAL, which is unlikely to change under this scenario.

Table 7 – Summary of options appraisal: Option 2 (at years 1 and 10) and baseline scenarios					
Group	Impact	Option 2: Year 1	Option 2: Year 10	Baseline + 1 Year	Baseline + 10 years
			within this timeframe. Therefore, it is likely that there will be a reduction to volume of proposed airspace. Whilst it is difficult to offer any precise metrics, this could result in reducing the impact on other airspace users and therefore reducing any noise impact.		
Communities	Local Air Quality	The Change Sponsor has assessed that other than Protector, Option 2 will not result in an increase in the number of aircraft operating in the local area, nor will the aircraft types be altered. Minimal reduction in overall air quality thought to be possible as establishment of segregated airspace should lead to minimal reroute of GA aircraft.	The Change Sponsor has assessed that, other than Protector, Option 2 will not result in an increase in the number of aircraft operating in the local area; Changes to overall air quality are expected to be in line with forecast civilian and military traffic levels only. Any consequential impact on local air quality from this option is negligible compared to the impact of baseline scenarios due to infrequent utilisation of the airspace by Protector. There is intention for Protector to be equipped with a fully certified DAA within this timeframe. Therefore, it is likely that there will be a reduction to	Protector would be unable to operate without Option 2. Therefore, airspace and associated activity would remain unchanged No reduction in air quality from existing aviation, since civil and military pilots would carry on as they do now – ATZ and MATZ would still be in existence. There is the likelihood that some rerouting already occurs below 3000FT AAL under this scenario, which would already impact air quality. As there is no anticipated increase in the number of civil aircraft operating in	Protector would be unable to operate without Option 2. Therefore, changes to overall air quality are expected to be in line with forecast civilian and military traffic levels only. Whilst there may be a change to airspace in the vicinity of military aerodromes in the future, it is best to assume that ATZ and MATZ would still be in existence. There is the likelihood that some rerouting already occurs below 3000FT

Table 7 – Summary of options appraisal: Option 2 (at years 1 and 10) and baseline scenarios					
Group	Impact	Option 2: Year 1	Option 2: Year 10	Baseline + 1 Year	Baseline + 10 years
			volume of proposed airspace. Whilst it is difficult to offer any precise metrics, this could result in reducing the impact on other airspace users and therefore reducing any impact on local air quality.	the local area, nor will the aircraft types be altered, the local air quality is likely to remain unchanged.	AAL under this scenario, which would already impact air quality.
Wider society	Greenhouse gas emissions	The Change Sponsor has assessed that, other than Protector, Option 2 will not result in an increase in the number of aircraft operating in the local area, nor will the aircraft types be altered. There may be a very small increase in greenhouse gas if GA do not / cannot take advantage of a crossing service (e.g. SUACS) to achieve a direct routing	The Change Sponsor has assessed that, other than Protector, Option 2 will not result in an increase in the number of aircraft operating in the local area. Changes to greenhouse gas emissions are expected to be in line with forecast civilian and military traffic levels only. Any consequential impact on greenhouse gas emissions from this option is negligible compared to the impact of baseline scenarios due to infrequent utilisation of the airspace by Protector. There is intention for Protector to be equipped with a fully certified DAA within this timeframe. Therefore, it is likely that there will be a reduction to volume of proposed airspace. Whilst it is difficult	Protector would be unable to operate without Option 2. Therefore, as the Change Sponsor has assessed that there is no anticipated increase in the number of aircraft operating in the local area, nor will the aircraft types be altered, the greenhouse gas emissions are likely to remain unchanged.	Protector would be unable to operate without Option 2. Changes to greenhouse gas emissions are expected to be in line with forecast civilian and military traffic levels only.

Table 7 – Summary of options appraisal: Option 2 (at years 1 and 10) and baseline scenarios					
Group	Impact	Option 2: Year 1	Option 2: Year 10	Baseline + 1 Year	Baseline + 10 years
			to offer any precise metrics, this could result in reducing the impact on other airspace users and therefore reducing any greenhouse gas emissions impact.		
Wider society	Tranquillity	The Change Sponsor has assessed that, other than Protector, Option 2 will not result in an increase in the number of aircraft operating in the local area, nor will the aircraft types be altered. Due to Infrequent utilisation of the airspace by Protector, the local tranquillity is likely to be unaffected.	The Change Sponsor has assessed that, other than Protector; Option 2 will not result in an increase in the number of aircraft operating in the local area. Changes to tranquillity are expected to be in line with forecast civilian and military traffic levels only. Any consequential impact on tranquillity from this option is negligible compared to the impact of baseline scenarios due to infrequent utilisation of the airspace by Protector.	Protector would be unable to operate without Option 2. Therefore, as the Change Sponsor has assessed that there is no anticipated increase in the number of aircraft operating in the local area, nor will the aircraft types be altered, the tranquillity is likely to be unaffected.	Protector would be unable to operate without Option 2. Changes to tranquillity are expected to be in line with forecast civilian and military traffic levels only.
Wider society	Biodiversity	The Change Sponsor has assessed that, other than Protector, Option 2 will not result in an increase in the number of aircraft operating in the local area, nor will the aircraft types be altered. Due to Infrequent utilisation of the airspace by Protector, the local biodiversity is likely to be unaffected.	The Change Sponsor has assessed that, other than Protector; Option 2 will not result in an increase in the number of aircraft operating in the local area. Changes to biodiversity are expected to be in line with forecast civilian and military traffic levels only. Any consequential impact on	Protector would be unable to operate without Option 2. Therefore, as the Change Sponsor has assessed that there is no anticipated increase in the number of aircraft operating in the local area, nor will the aircraft types be altered, the	Protector would be unable to operate without Option 2. Changes to biodiversity are expected to be in line with forecast civilian and military traffic levels only.

Table 7 – Summary of options appraisal: Option 2 (at years 1 and 10) and baseline scenarios					
Group	Impact	Option 2: Year 1	Option 2: Year 10	Baseline + 1 Year	Baseline + 10 years
			biodiversity from this option is negligible compared to the impact of baseline scenarios due to infrequent utilisation of the airspace by Protector. .	biodiversity is likely to be unaffected.	
Wider society	Capacity/ resilience	N/A	N/A	Protector would be unable to operate without Option 2. Therefore, no change to the current situation.	Protector would be unable to operate without Option 2. Therefore, no change to the current situation.
General Aviation	Access	There may be a very small impact on ease of access to the airspace proposed by Option 2 by GA. Estimated initial Protector flying tempo will require activation of segregated airspace up to 3 times per week. However, it is expected that Protector will need to access airspace infrequently and for a maximum of approximately 20 minutes during each departure or recovery phase. Access by GA will be maximised when Protector does not occupy the airspace by provision of a crossing service (e.g. SUACS). Option 2 provides flexibility in facilitating transit	There may be a small impact on ease of access to the Option 2 airspace design options, in line with forecast civilian and military traffic levels only. Estimated initial Protector flying tempo will require activation of segregated airspace up to 3 times per week. However, it is expected that Protector will need to access airspace infrequently and for a maximum of approximately 20 minutes during each departure or recovery phase. Access will be maximised when Protector does not occupy the airspace by provision of a	Protector would be unable to operate without Option 2. Therefore, no change to the current situation.	Protector would be unable to operate without Option 2. There would be no consequential impact to access from this option and changes to access are expected to be in line with forecast civilian and military traffic levels only.

Table 7 – Summary of options appraisal: Option 2 (at years 1 and 10) and baseline scenarios					
Group	Impact	Option 2: Year 1	Option 2: Year 10	Baseline + 1 Year	Baseline + 10 years
		within 5NM of RAF Marham through the split of the proposed airspace into 2 areas, thus reducing the requirement for GA to re-route or to hold outside the proposed airspace. Gliders without communication equipment are likely to be unable to enter the DA, as they would not be able to receive a SUACS.	crossing service (e.g. SUACS). Option 2 provides flexibility in facilitating transit within 5NM of RAF Marham through the split of the proposed airspace into 2 areas, thus reducing the requirement for aircraft to re-route or to hold outside the proposed airspace. Gliders without communication equipment are likely to be unable to enter the DA, as they would not be able to receive a SUACS. There is intention for Protector to be equipped with a fully certified DAA within this timeframe. Therefore, it is likely that there will be a reduction to volume of proposed airspace. Whilst it is difficult to offer any precise metrics, this could result in reducing the impact on other airspace users.		
General Aviation / commercial airlines	Economic impact from increased effective capacity	N/A	N/A	N/A	N/A

Table 7 – Summary of options appraisal: Option 2 (at years 1 and 10) and baseline scenarios					
Group	Impact	Option 2: Year 1	Option 2: Year 10	Baseline + 1 Year	Baseline + 10 years
General Aviation / commercial airlines	Fuel burn	There may be a small increase in fuel burn if GA do not / cannot take advantage of a crossing service (e.g. SUACS) to achieve a direct routing.	There may be a small increase in fuel burn in line with forecast civilian and military traffic levels, if aircraft do not / cannot take advantage of a crossing service (e.g. SUACS) to achieve a direct routing.	Protector would be unable to operate without Option 2. Therefore, as the Change Sponsor has assessed that there is no anticipated increase in the number of aircraft operating in the local area, nor will the aircraft types be altered, the fuel burn is likely to remain unchanged	Protector would be unable to operate without Option 2. Therefore, Changes to fuel burn are expected to be in line with forecast civilian and military traffic levels only.
Commercial airlines	Training costs	No perceived training costs.	No perceived training costs.	Not applicable	Not applicable
Commercial airlines	Other costs	No other costs anticipated.	No other costs anticipated.	Not applicable	Not applicable
Airport /ANSP	Infrastructure costs	No infrastructure costs will be imposed.	No infrastructure costs will be imposed.	Not applicable	Not applicable
Airport /ANSP	Operational costs	No operational costs anticipated.	No operational costs anticipated.	Not applicable	Not applicable

Table 7 – Summary of options appraisal: Option 2 (at years 1 and 10) and baseline scenarios					
Group	Impact	Option 2: Year 1	Option 2: Year 10	Baseline + 1 Year	Baseline + 10 years
Airport /ANSP	Deployment costs	No costs anticipated for deployment.	No costs anticipated for deployment.	Not applicable	Not applicable
Airport /ANSP	Other costs	No other costs foreseen.	No other costs foreseen.	Not applicable	Not applicable
Safety Considerations (not an exhaustive list)		Pilots being unaware of new airspace. Re-route through unfamiliar areas. Funnelling as a result of need to re-route. Increased controller workload due to funnelling/SUACS requests.	Funnelling as a result of need to re-route. Increased controller workload due to funnelling/SUACS requests.	Protector would be unable to operate without Option 1 or 2. Therefore, as the Change Sponsor has assessed that there is no anticipated increase in the number of aircraft operating in the local area, nor will the aircraft types be altered, there are no safety considerations.	Protector would be unable to operate without Option 1 or 2. Therefore, safety considerations are expected to be in line with forecast civilian and military traffic levels only.

Summary

21 Next steps in this proposal

21.1 This document will be submitted to the CAA as evidence to support ACP-2023-022 Stage 4. It is part of the documentary evidence for the Stage 4 Submission (scheduled for 20 September 2024).

21.2 The following CAP1616 timeline is anticipated:

Event as per CAP 1616	Planned Date
Stage 4 – Update and Submit	20 September 2024
Stage 5 - Decide	13 January 2025
Stage 6 - Implement	17 April 2025

Appendix A: LoA En-Route Protector Operations – NATS, 78 Sqn, 19 Sqn and 56 Sqn (In draft)

OFFICIAL

Letter of Agreement

Between

NATS (En Route) PLC (“ν”)

And

78 Squadron

And

19 Squadron

And

56 Squadron

NATS

Effective Date: 23/09/2024
Review Date: 31/08/2026

NATS - PRIVATE

OFFICIAL

LETTER OF AGREEMENT

between

(1) NATS (En Route) PLC ("NATS")

4000 Parkway, Whiteley, Fareham, Hampshire PO15 7FL

Operating

Scottish Control (Prestwick) ("NATS Unit 1")

Prestwick Centre, Fresson Avenue, Prestwick, Ayrshire, KA9 2GX

And

(2) London Control (Swanwick) ("NATS Unit 2")

Swanwick Centre, Sopwith Way, Swanwick, Hampshire, SO31 7AY

And

(3) 78 Squadron ("MOD")

Swanwick Centre, Sopwith Way, Swanwick, Hampshire, SO31 7AY

And

(4) 19 Squadron ("MOD")

RAF Boulmer, Alnwick, NE66 3JF

And

(5) 56 Squadron ("Airspace User")

RAF Waddington, Lincoln, LN5 9NB

Together referred to as **"the Parties"**.

Effective Date: 23/09/2024

1 GENERAL

1.1 The purpose of this Letter of Agreement is to define the procedures to be applied between the Parties within the airspace as set out within Section 2 of this Agreement.

1.2 This Letter of Agreement permits the Airspace User operating Protector RPAS drones to fly within the airspace as set out within Section 2 of this Agreement. RAFAT activity may also take place within part of this airspace as noted in Annex A. The RAFAT and Protector user groups will be managed by the MOD in conjunction with the MAMC through extant ASM processes.

1.3 With regards to CAA policy on Special Use Airspace Buffers, this Letter of Agreement details the agreed reduction of these buffers to allow safe operations.

1.4 The signatories to this Agreement are accountable for ensuring that the obligations set out by the Procedures in this Agreement are met in full.

1.5 This Agreement shall start on the Effective Date and shall be reviewed every 2 years for safety and applicability.

2 DESCRIPTION OF WASH CTA 1 (Y70) CROSSING ROUTES AND EGD324 A/B

2.1 A map of pre-agreed routes for crossing WASH CTA 1 (Y70) is contained at ANNEX A.

2.2 EGD324 A/B are as defined in the UK AIP. A map and vertical cross-section are contained in ANNEX A.

3 PROCEDURES

3.1 The procedures to be applied between the Parties, are detailed in the Annexes to this Letter of Agreement:

ANNEX A: Procedures
ANNEX B: Telephone Communications
ANNEX C: Abbreviations and Definitions
ANNEX D: Checklist

4 OPERATIONAL STATUS

4.1 All parties shall keep each other advised of any changes to operational facilities or any other matters which may affect the procedures specified in this Letter of Agreement.

5 REVISIONS

5.1 Any revision to the Letter of Agreement, excluding Annexes, requires the mutual written consent of the Letter of Agreement signatories or the successor to their position/roles and requires the Letter of Agreement to be re-signed.

5.2 Any revision to the Annexes of the Letter of Agreement requires the mutual written consent of the designated representatives of the signatories but does not require the Letter of Agreement to be re-signed.

6 DEVIATIONS

6.1 When necessary the appropriate Operational Supervisor(s) of the parties or responsible representative of the Airspace User may introduce, by mutual agreement, temporary modifications to the procedures laid down in the Annexes to the Letter of Agreement for a specific time period within the existing term of this Letter of Agreement.

6.2 Instances may arise where incidental deviations from the procedures specified in the Annexes to this Letter of Agreement may become necessary. Under these circumstances air traffic controllers are expected to exercise their best judgement to ensure the safety and efficiency of air traffic.

7 CANCELLATION

7.1 Cancellation of this Letter of Agreement by one of the signatories (or their successors) is possible at any time in relation to ongoing and significant safety related matters which have not been remedied within a reasonable period following regular consultation between the signatories.

8 INTERPRETATION AND SETTLEMENT OF DISPUTES

8.1 Should any doubt or diverging views arise regarding the interpretation of any provision of the present Letter of Agreement or in case of dispute regarding its application, the parties shall endeavour to reach a solution acceptable to them all.

8.2 Should no agreement be reached, each of the parties shall refer such dispute to the CAA for determination.

9 REQUESTING AN AMENDMENT TO THE LETTER OF AGREEMENT

9.1 It is the responsibility of the MOD to seek agreement from NATS to any amendment of this Letter of Agreement.

9.2 Where one of the parties wishes to amend the Letter of Agreement then they will send a written request to the other party no later than 3 months prior to the proposed amendment date.

10 REVIEWING THE LETTER OF AGREEMENT

10.1 It is the responsibility of all parties to review this Letter of Agreement at least every 2 years.

10.2 A review of the Letter of Agreement may be requested by any of the signatories and at any time.

10.3 When changes are made to the Letter of Agreement, the appropriate footer of either the main body or Annex affected will be updated. In addition, ANNEX D shall be updated to reflect the changes.

Scottish - London - 78 Sqn - 56 Sqn - 19 Squadron (Protector)
SIGNATURE PAGE

SIGNED	
Name: [redacted] **Position/Role:** General Manager **Unit:** Scottish Control (Prestwick) NATS (En Route) PLC **DATE:**	

SIGNED	
Name: [redacted] **Position/Role:** General Manager **Unit:** London Control (Swanwick) NATS (En Route) PLC **DATE:**	

SIGNED	
Name: [redacted] **Position/Role:** OC 78 Sqn **Organisation:** 78 Sqn (Swanwick Military) **DATE:**	

SIGNED	
Name: [redacted] **Position/Role:** OC 19 Sqn **Organisation:** 19 Squadron **DATE:**	

SIGNED	
Name: [redacted] **Position/Role:** OC 56 Sqn **Organisation:** 56 Squadron **DATE:**	

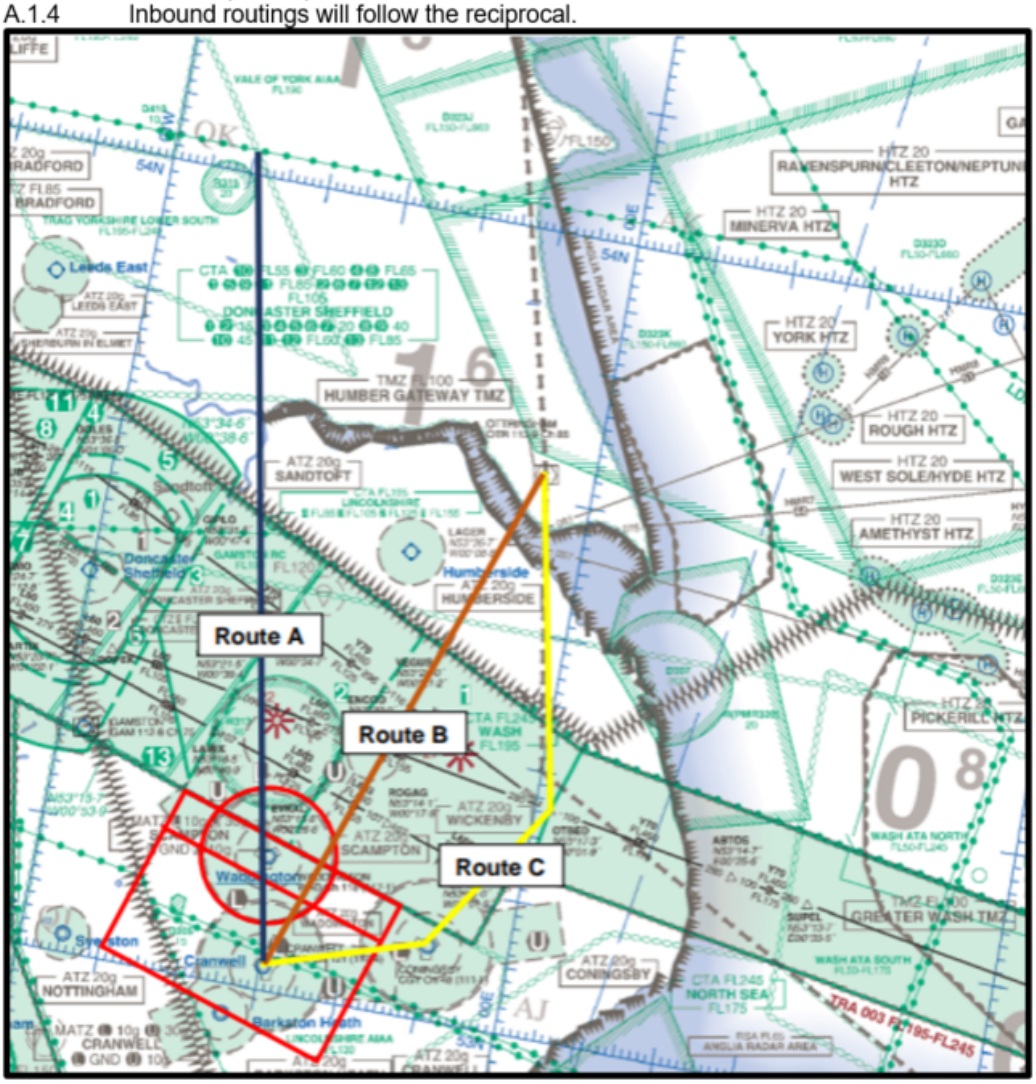
ANNEX A

PROCEDURES

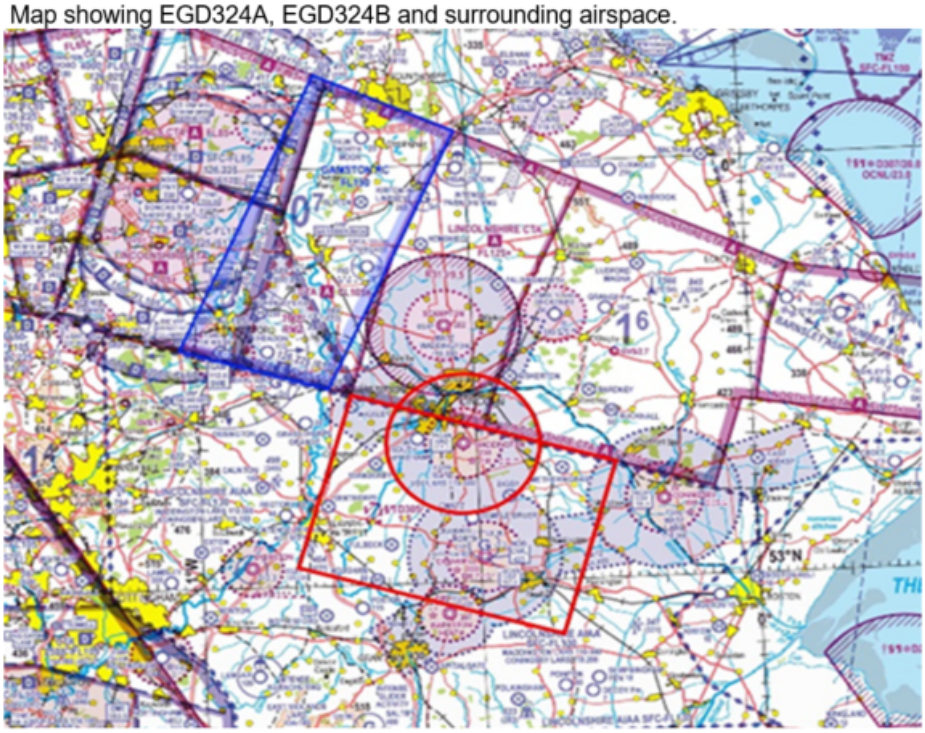
Effective: 23/09/2024

A.1 Map of the WASH CTA 1 (Y70) crossing routes

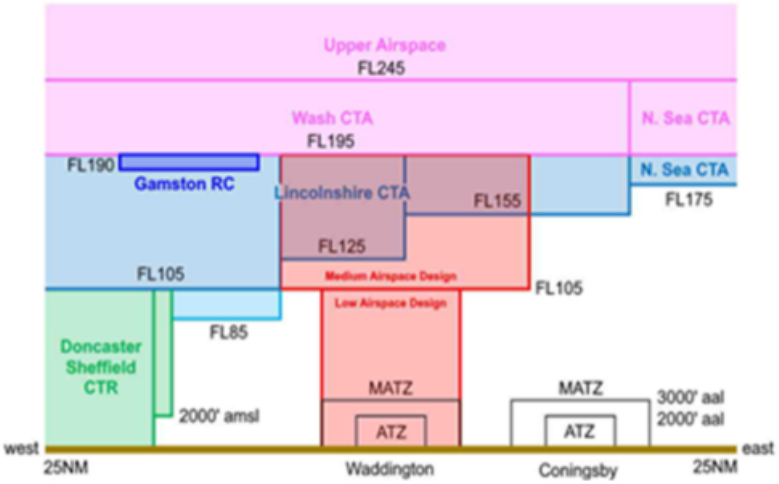
A.1.1 Route A (Dark Blue) – CWL-ERKIT
A.1.2 Route B (Orange) – CWL-OTR
A.1.3 Route C (Yellow) – CWL-CGY-OTBED-OTR
A.1.4 Inbound routings will follow the reciprocal.



A.1.5 Map showing EGD324A, EGD324B and surrounding airspace.



A.1.6 Vertical Cross-Section of EGD324A/B and surrounding airspace



A.2.1 Procedures

A.2.1 EG D324 (A+B)

A.2.1.1 A Special Use Airspace Crossing Service (SUACS) of EGD324 A+B will be available from Waddington Radar and a Special Use Airspace Activity Information Service (SUAAIS) will be available from London Information in accordance with the UK AIP whilst the DA is active.

A.2.1.2 Once Protector is established within EGD324B, Waddington Radar will handover to 78 Squadron, Swanwick (Mil) in accordance with the 78 Squadron – Lincs TATCC LoA transfer of control conditions. Protector will then be placed on a relevant Short Term Conflict Alert (STCA) enabled East squawk (3310-3337) for onwards routing.

A.2.1.3 EGD324A+B will be activated by NOTAM for Protector RPAS BVLOS activities.

A.2.1.4 Swanwick (Mil) Controllers will coordinate with the London Control (Swanwick) S10 Controller and Scottish Control (Prestwick) East Controller when operating above FL175 in EGD324B if TRA003 is not active. When TRA003 is active the Protector RPAS may operate up to FL195 without coordination with the civil sectors above.

A.2.1.5 EGD324B includes an internal 3nm buffer zone running along the northern edge of the Danger Area abutting with LIN-2 and LIN-3 CTAs (as per diagram below). Swanwick (Mil) Controllers will coordinate with the Scottish Control (Prestwick) East Controller before entering this buffer zone. This buffer zone will be displayed on the Radar map of the controlling agency.

A.2.2 Protector

A.2.2.1 Protector will have designated 56 Sqn callsign[1] and a number as appropriate (e.g. PHOENX1, PHOENX2 etc.) and use a Waddington Radar Mode 3A Squawk (3601 — 3634) while operating in EGD324A.

A.2.2.2 Protector activity within TRAs has been enabled through an amendment to autonomous operations procedures[2]. The change ensures that TRAs become a known traffic environment. NATS will continue to provide a UKFIS to civil aircraft within the TRAs during Protector activity.

A.2.2.3 TRA operations will be conducted primarily to facilitate the transit of Protector RPAS between aerodromes and operating airspace structures, for example a TRA003 transit to facilitate departure from the Waddington DA and entry into Holbeach AWR.

A.2.3 Diversion

A.2.3.1 RAF Marham is the nominated diversion airfield for Protector.

A.2.3.2 **MRM (EGD296 A/B).** A Temporary Danger Area (TDA)[3] established to provide a diversion airfield for PTR. The DA is split into two parts: a 'cylinder' (EGD296A); a 5nm radius circle centred on MRM ARP, active from surface to FL105, and a further 'cylinder' (EGD296B); a 5nm radius circle centred on MRM ARP, active from FL105 to FL195.

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[1] DRUMSTICK, FIREBIRD, PHOENIX, SCORCHER and SKOOBY. Callsigns are to be abbreviated as required for Swanwick operating system – e.g FIREBD1.
[2] MIL AIP ENR 5.2.2.7 16/06/2024 (excerpt):
e. Autonomous operations are not permitted when BVLOS UAS activity is notified within an active TRA. BVLOS UAS activity within an active TRA is promulgated via NOTAM and the TRA Plan, which is incorporated in the Daily MDA Plan. Military pilots of aircraft planning to operate in the TRA should ensure they are aware of any promulgated BVLOS activity.
[3] Permanent Airspace Change Proposal (ACP) ongoing: ACP-2023-022

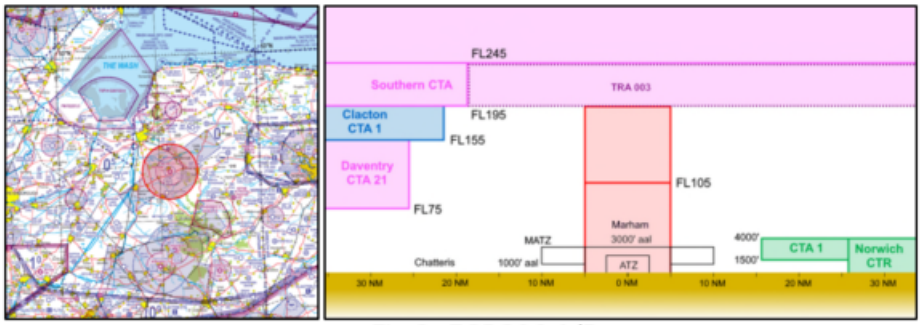


Fig 2. EGD296 A/B

A.2.3.3 A SUACS of EGD296[4] A+B will be available from Marham Zone and a SUAAIS will be available from London Information in accordance with the UK AIP whilst the DA is active.

A.2.4 WASH CTA 1 (Y70) Crossing

A.2.4.1 78 Squadron controllers are not to take 5 (5nm or 5000ft separation against GAT) across CAS[5], instead will negotiate a Cleared Flight Path (CFP) utilising one of the crossing routes detailed at Annex A.1; however, should circumstances allow, tactical freedom to cross Controlled Airspace (CAS) using the most expeditious and direct routing will be negotiated between 78 Squadron and Scottish Control (Prestwick) East.

A.2.4.2 Swanwick (Mil) Controllers will indicate to the Scottish Control (Prestwick) North Assistant and Scottish Control (Prestwick) East Controller that the aircraft is Protector RPAS BVLOS when prenoting and when requesting a CFP by stating 'RPAS'.

A.2.4.3 Swanwick (Mil) Controllers shall endeavour to prenote the Protector RPAS and request a CFP. Whilst Protector RPAS is in Controlled Airspace, the Scottish Control (Prestwick) East Controller will provide 5nm horizontal and/or 2000ft vertical separation between aircraft under their control and the Protector RPAS CFP level. Swanwick (Mil) Controllers will not climb or descend Protector RPAS without further coordination.

A.2.4.4 Transits should ordinarily be conducted in level flight between FL200 and FL230 to minimise impact on civil ATC, network operations and General Air Traffic (GAT). Tactical coordination can be undertaken between controllers, dependent on the traffic situation, to provide flexibility to the aircraft when the GAT situation dictates.

[4] AIC Y 025/2024 (Apr 24) - MRH TDA AIC
[5] To be included in the NATS-HQAir-HQNavy-BAEWarton Coordination LoA as: A.3.9.4.1.4 78 Squadron Swanwick (Military) shall not Take 5 within Class A & C Airspace with the Protector RPAS crossing WASH CTA 1 (Y70).

A.2.4.5 Outbound - Protector will remain within the confines of EGD324B (the 'box' portion of the MDA), ensuring that the 3nm CAS buffer is observed. The 78 Squadron controller:

a. will endeavour to prenote the CFP request,
b. will request a cleared flight path (CFP) with the relevant civil sectors for the intended routing.

A.2.4.6 Inbound– Once notified by the RPAS operator of the intention to RTB. The 78 Squadron controller will confirm the intended routing with the RPAS operator and:

a. will endeavour to prenote the CFP request,
b. will request a cleared flight path (CFP) with the relevant civil sectors for the intended routing,
c. notify Waddington Radar accordingly.

A.2.5 Special Use Areas

A.2.5.1 78 Squadron will transit Protector to EGD207 (Holbeach range) via TRA003 to operate once approval to enter has been granted.

A.2.5.2 Once WASH CTA 1 (Y70) has been crossed, 78 Squadron will transit Protector across TRA006 to EGD323 complex or intended operating area(s).

A.2.5.3 As per A.2.7.4, Protector is to be re-identified and placed under an appropriate ATS prior to leaving a SUA.

A.2.5.4 Once established within SUA, Protector can be worked by either C2 (Command and Control) agency, 78 or 19 Squadron.

A.2.6 Lost Link Procedures

A.2.6.1 Lost link is the term given to a temporary or permanent loss of command and return link between the ground control station and the aircraft. Although open source, ADSB data will be available for increased SA.

A.2.6.2 Protector will squawk Mode 3A 7400 as per Civ AIP ENR 1.6 and continue iaw its pre-programmed lost link mission which will involve a predictable recovery to either RAF Waddington or RAF Marham.

A.2.6.3 Protector operators will ensure the lost link mission is programmed such that it will carry out its ordered routing for a minimum of 15 minutes. Whenever the routing is issued / updated, the lost link profile will also be updated and communicated to the controller as and when required.

A.2.6.4 Following full loss of link, the Protector crew will inform the relevant Command and Control (C2) agency of the lost link profile via telephone.

A.2.6.5 The profile [and that the UAV is in lost link] should be relayed to the appropriate civil sector and any other relevant ATM agencies to ensure that the profile can be flown unimpeded and enable the handling C2 agency and NATS controllers to enact any additional deconfliction/coordination.

A.2.6.6 In the event of full lost link, the Pilot in Command will have no situational awareness of Protector RPAS and will be reliant on the relevant C2 agency for updated information on the aircrafts position and trajectory specific to the lost link mission. The last programmed lost link mission and associated flight trajectory remains extant.

A.2.6.7 Any deviation from the planned lost link mission, the Pilot in Command and NATS GS are to be notified immediately by the relevant C2 agency.

A.2.6.8 If Protector RPAS regains link, the Pilot in Command will contact the handling C2 agency and agree a re-contact frequency. The Pilot in Command will then decide whether to RTB the aircraft or carry on with intended tasking as this is situational dependent.

A.2.6.9 Protector will have no collision avoidance capability in lost link condition. On loss of both links, TCAS will automatically be switched to Traffic Advisory (TA)-ONLY mode so will not coordinate with conflicting aircraft or generate any Resolution Advisory (RA). Protector will still be tracked as a passive target by other TCAS-equipped aircraft, which will therefore manoeuvre to avoid any imminent collision.

A.2.7 Type of Service (ToS)

A.2.7.1 When transiting TRA's, a minimum of a Traffic Service (TS) will be applied iaw CAP774 (UKFIS). A higher level of service may be requested by the pilot at any time.

A.2.7.2 Although there is no prescribed minima under a TS, deconfliction advice may be requested by the pilot at any time.

A.2.7.3 When crossing / transiting CAS, a Radar Control (RC) service will be applied.

A.2.7.4 When operating within segregated airspace, Protector can routinely operate autonomously but is to be re-identified and placed under an appropriate ATS prior to leaving segregated airspace. As per 2.5.3, should an ATS be required within SUA, this can be provided by either 78 or 19 Squadron.

A.2.8 GAT Emergencies

A.2.8.1 Irrespective of the EG D324A or EG D324B activity status, NATS reserves the right to enter the airspace with any aircraft in an emergency. GAT under the control of NATS shall be instructed to squawk Mode 3A 7500, 7600, or 7700 as appropriate.

A.2.8.2 The relevant Scottish Control (Prestwick) Group Supervisor (GS) or OS or London Control (Swanwick) AC GS or OS shall inform the Waddington Supervisor (EG D324A) or the Waddington Supervisor and the Swanwick (Mil) Supervisor (EG D324B) of the intention to enter the Danger Areas, along with the pilot intentions.

ANNEX B

TELEPHONE COMMUNICATIONS

Effective: 23/09/2024

ORGANISATION	TELEPHONE NUMBER/S
London Control (Swanwick) Operations Supervisor	[redacted]
Scottish Control (Prestwick) Operations Supervisor	[redacted]
Lincs TATCC Waddington Radar	[redacted]
Lincs TATCC Waddington Supervisor	[redacted]
Scottish Control (Prestwick) East Controller	[redacted]
London Control (Swanwick) S10 Controller	[redacted]
78 Squadron (Swanwick) Supervisor East	[redacted]
78 Squadron (Swanwick) Supervisor North	[redacted]
78 Squadron (Swanwick) Supervisor West	[redacted]
19 Squadron Supervisor	[redacted]
56 Squadron Supervisor (Airspace User)	TBC
Swanwick ATM Procedures	[redacted]
Prestwick ATM Procedures	[redacted]

ANNEX C

ACRONYMS AND DEFINITIONS

Effective: 23/09/2024

ACRONYM	DEFINITION
AC	Area Control
BVLOS	Beyond Visual Line-0f-Sight
CAS	Controlled Airspace
CTA	Control Area
DACS	Danger Area Crossing Service (DACS)
DME	Distance Measuring Equipment
ETA	Estimated Time of Arrival
FL	Flight Level
GAT	General Air Traffic All flights conducted in accordance with the rules and procedures of ICAO and/or the national civil aviation regulations and legislation. Note. GAT can include military flights for which ICAO rules and procedures satisfy entirely their operational requirements.
GS	Group Supervisor
IAS	Indicated Air Speed
IFR	Instrument Flight Rules
LTMA	London Terminal Manoeuvring Area
NOTAM	Notice to Airmen
OAT	Operational Air Traffic All flights which do not comply with the provisions stated for GAT and for which rules and procedures have been specified by appropriate authorities. Note. OAT can include civil flights such as test-flights, which require some deviation from ICAO rules to satisfy their operational requirements.
RAFAT	Royal Air Force Aerobatic Team (RAFAT)
RPAS	Remotely Piloted air System

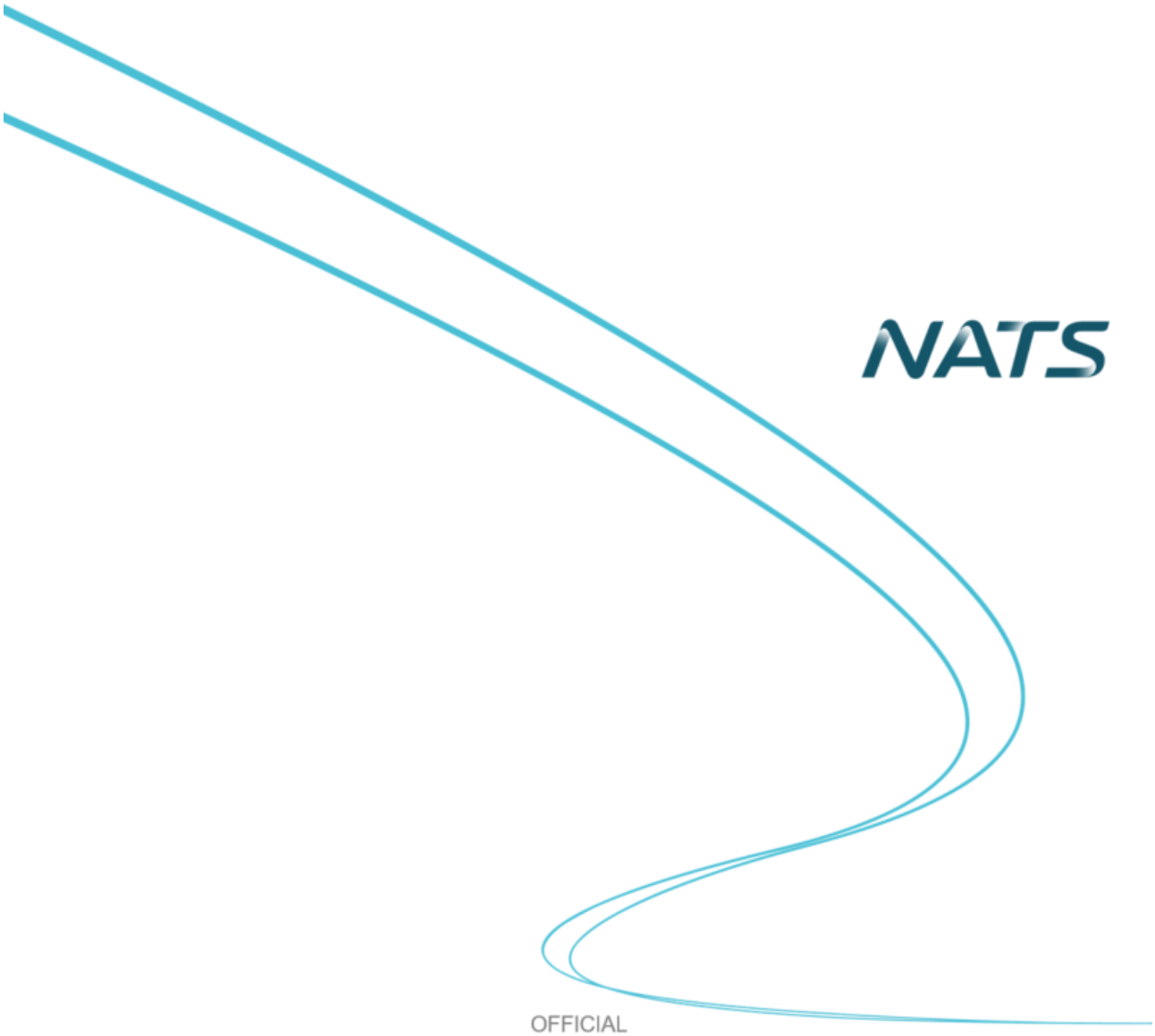
TATCC	Terminal Air Traffic Control Centre
TC	Terminal Control
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions

ANNEX D

CHECKLIST

Effective: 23/09/2024

SECTION	EFFECTIVE DATE	REVIEW DUE BY
Front Part	23/09/2024	31/08/2026
Annex A	23/09/2024	31/08/2026
Annex B	23/09/2024	31/08/2026
Annex C	23/09/2024	31/08/2026
Annex D	23/09/2024	31/08/2026



Appendix B: LoA Terminal Protector Operations (in draft)

OFFICIAL

20240908-Terminal LoA - Protector Operations

08 September 2024

LETTER OF AGREEMENT - PROTECTOR OPERATIONS

References:
A. MAA RA 1600 - Remotely Piloted Air Systems
B. MAA Protector RPAS – Airspace Integration Position Paper (Mar 22), Update (Sep 23)
C. UK Mil AIP ENR 5.1 – Prohibited, Restricted and Danger Areas
D. UK Civil AIP ENR 5.1 - Prohibited, Restricted and Danger Areas
E. Aeronautical Information Circular Y 025/2024 (Apr 24)
F. 2 Gp BM Order 137 – Certified RPAS Air Traffic Service Provision
G. En-Route LoA – Protector Operations

Purpose

1. The purpose of this Letter of Agreement (LoA) is to define the procedures to be applied between Aerodromes, Air Navigation Service Provider (ANSPs) and Operators to facilitate support to Protector Operations.

Stakeholders

2. Units participating in this LoA:

a. RAF Waddington (WAD) (encompassing WAD ATC and WAD Ops)
b. Lincs TATCC (encompassing WAD Radar)
c. RAF Marham (MRM) (encompassing MRM ATC and MRM Ops)
d. 78 Sqn, Swanwick (78 Sqn)
e. 56 Sqn, RAF Waddington (PTR)
f. 31 Sqn, RAF Waddington (PTR Ops)

Introduction

3. The General Atomics MQ9B Protector RPAS is classified iaw Ref A as a Certified RPAS. To facilitate Trial PREVALENT PHEONIX activity, Ref B outlines the MAA's requirements for Protector operations to be conducted within specific airspace and with pre-established ANSP agreement.

Planning

4. PTR activity will be coordinated at the WAD weekly Operational Planning Group (OPG). PTR Ops are responsible for engaging with both WAD and MRM Ops to ensure activity falls within standard operating hours. Both WAD and MRM Ops will be invited to the WAD weekly OPG, to ensure awareness. Additional Signatories seeking awareness of planned PTR activity ahead of NOTAM activation will be invited upon request. Where there are planned changes to the routine operating hours for both WAD and MRM i.e., Night Flying; these should be communicated to PTR Ops at the earliest opportunity to enable effective early planning.

Airspace

5. **Airspace Structures.** To provide segregated airspace as required by Ref B, and allow PTR to climb and descend safely the following airspace has been established at both WAD (primary operating location) and MRM (diversion airfield), along with an amendment to Temporary Reserved Area (TRA) operations:

a. **WAD (EGD324 A/B).** A permanent Danger Area (DA) established to facilitate both PTR and RAFAT operations. The DA is split into two parts: a 'cylinder' (EGD324A); a 5nm radius circle centred on WAD Airfield Reference Point (ARP), active from surface to FL105, and a 18 x 13 nm 'box' (EGD324B), which extends southwards from the southern side of the 'cylinder', active FL105 to FL195.

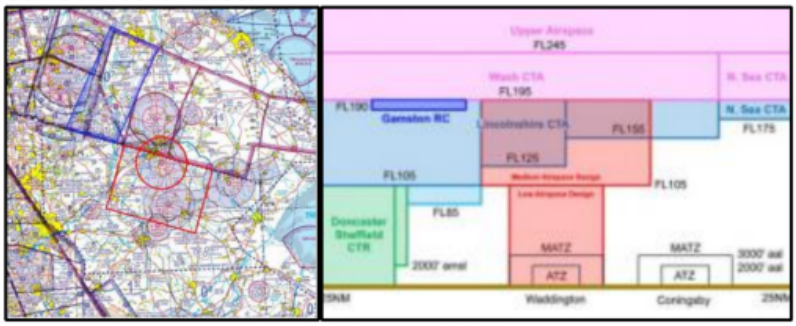


Fig 1. EGD324 A/B

b. **MRM (EGD296 A/B).** A Temporary Danger Area (TDA)[1] established to provide a diversion airfield for PTR. The DA is split into two parts: a 'cylinder' (EGD296A); a 5nm radius circle centred on MRM ARP, active from surface to FL105, and a further 'cylinder' (EGD296B); a 5nm radius circle centred on MRM ARP, active from FL105 to FL195.

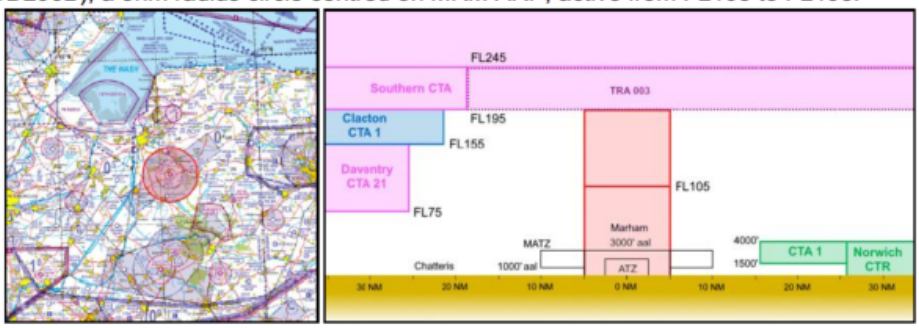


Fig 2. EGD296 A/B

c. **TRA (003 & 006).** An amendment iaw Ref C to routine TRA operations that prevents military autonomous operations when BVLOS UAS activity is notified. To enable access to the MRM DA, TRA 003 must be notified for BVLOS UAS activity. Similarly access to the EGD323 complex is only enabled through TRA 006 BVLOS UAS notification.

6. **Airspace Activations.** Airspace activation responsibilities are shared between PTR Ops and WAD Ops, dependent on the airspace:

[1] Permanent Airspace Change Proposal (ACP) ongoing: ACP-2023-022

a. **WAD DA (EGD324 A/B).** Responsibility of WAD Ops with activation via NOTAM at least 24 hours in advance.

b. **MRM DA (EGD296 A/B).** Responsibility of PTR Ops on behalf of MRM Ops with activation via CAA AR Ops at least 24 hours in advance.

c. **TRA (003 and/or 006).** Responsibility of PTR Ops with activation via MAMC (utilising the LARA WBC) by 0900L on D-1 iaw Ref C.

d. **Operating Airspace (i.e. D323 complex).** Responsibility of PTR Ops with activation via MAMC (utilising the LARA WBC) by 0900L on D-1 iaw Ref C.

7. **Airspace Cancellations.** Where PTR sortie requirements change and PTR no longer requires the airspace for the remainder of the activation period, it is the responsibility of PTR Ops to inform WAD Ops, who in conjunction with PTR Ops will enact airspace cancellations.

8. **Airspace Management.** Throughout the airspace activation period both a Special Use Area Crossing Service (SUACS) and Special Use Airspace Activity Information Service (SUAAIS) will be provided iaw the following:

a. **WAD DA (EGD324 A/B).** (Ref D).
   i. SUACS: WAD Radar on 119.500 MHz. / SUAAIS: London Info on 124.600 MHz.

b. **MRM DA (EGD296 A/B).** (Ref E)
   i. SUACS: MRM Zone on 124.150 MHz. / SUAAIS: London Info on 124.600 MHz.

9. **Airspace Status Naming Conventions.** Dependent on activity, iaw Ref F, DA status shall be described in the following manner to assist with communication between ANSPs:

a. **Active:** DA activated iaw NOTAM.
b. **Inactive:** DA not activated.

c. **Hot:** PTR either on start, airborne within the DA or due to enter the DA within 15 mins.
d. **Cold:** PTR not on start, not airborne within the DA and not due to enter the DA within 15 mins. Additionally, where PTR sorties are confirmed complete by WAD ATC.

Note. Due to limitations in the display of airspace status and potential for confusion controllers, 78 Sqn will only refer to the airspace as Active / Inactive, with SUACS requested as required.

10. **Airspace Facilitating Procedures.** To facilitate flexible use of airspace the following procedures apply pending airspace activity:

a. **Active and Hot.** Where the DA status is *'Active and Hot'*, a SUACS approval is required for all DA crossings.

b. **Active but Cold.** When the entire DA or elements of the DA are *'Active but Cold'*, DA crossings by ANSPs may be authorised without the requirement to obtain a specific SUACS approval iaw with local agreements[2].

[2] CON and CWL Radar. Authorised to cross the WAD DA as outlined within the Lincs TATCC Order Book.

Aerodrome Provision

11. **PDs, Diversions and Local Flying.** To facilitate operations iaw their established Station Command Plan; both WAD and MRM reserve the right to refuse / restrict / limit both PTR operations and/or other aviation activity such as PDs, Diversions and Local Flying. These restrictions should be identified as part of the weekly OPG to aid with planning activity and enable deconfliction measures to be established.

12. **Airfield Status.** Whilst PTR Operator(s) will endeavour to track airfield status changes through ATIS information codes, any change that will result in an amendment to the pre-established Lost Link profile should be communication by WAD and/or MRM to PTR Operator(s) at the earliest opportunity.

13. **Crash Cover.** PTR requires ICAO Level 3 crash cover. Where this is not available the relevant aerodrome shall inform PTR Operator(s) and/or PTR Ops at the earliest opportunity.

14. **Ground Movements.** All PTR ground movements (outside of Taxi movements) will be conducted under tow with PTR Ground Crew providing support.

15. **Aircraft Last Look Check Capability (ALLC).** An ALLC should be provided through establishment of a TRC, if available, for all PTR operations. TRC ASOS from both WAD and MRM should conduct familiarisation trg at the earliest opportunity to maximise the ALLC effectiveness.

ATS Provision

16. **Type of Service (ToS).** Whilst established within either the WAD or MRM DAs, iaw Ref F and in line with the Class G airspace classification; PTR will be provided a Traffic Service throughout. Traffic Information (TI) will be provided iaw CAP 774 with relevant TI provided to Protector regarding aircraft operating close to the DA boundary. Controllers should be cognisant of the TCAS characteristics of PTR outlined in Ref F.

17. **Aircraft Integration.** Whilst a SUACS is required throughout the DA activation period, crossing approvals are not permitted through *'Active and Hot'* DA elements, unless in adherence with one of the following procedures iaw Ref F:

a. **Operating iaw a LoA**, specific to the DA.

b. **Security, Emergency and Unusual Activity flights.** In the event of a Security, Emergency or Unusual Activity flight requesting DA entry, controllers are authorised to facilitate the DA crossing informing the aircraft of PTRs position and intentions.

c. **Simultaneous Mil-Mil Activity.** Simultaneous Mil-Mil activity within the DA between PTR and other crewed aircraft is authorised iaw Ref F, providing standard vertical and lateral separation iaw para 18 is established and maintained throughout.

18. **Separation Standards.** Irrespective of the ToS, PTR will be procedurally deconflicted from all other aircraft operating simultaneously within the DA. Iaw Ref F, this deconfliction shall always initially be provided through the establishment of vertical (1000ft) and/or lateral (3 or 5 nm) separation. Traffic Information (TI) shall be provided to both parties on all occasions. These separation standards shall only be reduced where supported through a LoA specific to the DA (i.e. LNAA Operations at RAF Waddington).

Protector Flight Profile

19. **Start Procedure.** PTR will be towed to its assigned operating position and then started by Ground Crew. PTR Ground Crew will request start from the Aerodrome Controller (ADC) or Ground Controller (GRD) via MRE Radio, passing the tail number and confirming the ATIS Information. After engine start control of PTR will be transferred from the PTR Ground Crew to the PTR Operator(s), who will contact ADC/GRD via the assigned frequency re-confirming the ATIS Information. PTR aircrew will primarily utilise the FIREBIRD callsign, but also utilise PHOENIX, SCORCHER, DRUMSTICK and SKOOBY. Taxi procedures will be conducted iaw with standing Aerodrome procedures.

20. **Pre-Departure Requirements.** When operating at either WAD or MRM, when PTR is on engine start ASC/GRD will prenote Terminal Radar (RAD) who in turn will declare the respective DA Hot. On receipt of the prenote RAD will provide a Mode 3A Code and frequency. Dependent on the intentions of PTR, RAD will subsequently prenote 78 Sqn with the planned routing and operating area.

21. **Generic Departure Flight Profile.** PTR will depart and climb in a spiral inside the DA to 3000ft QFE. When established in the climb safely PTR will be transferred from ADC to RAD. RAD will then continue to climb PTR to FL100 inside the DA, taking approximately 10 minutes from departure to reach FL100. On receipt of the prenote 78 Sqn will provide a Mode 3A Code and frequency.

22. **Transition from DA 'A' to 'B' elements.** To facilitate onward handover to 78 Sqn and departure from DA 'B', once established at FL100 within the DA 'A' element, PTR will be instructed to climb not above FL170 and will re-position into the DA 'B' element. As PTR passes FL160 it will be handed from RAD to 78 Sqn. Airspace ownership of the entire DA 'B' element from FL105 to FL195 will then be delegated to 78 Sqn for the period that PTR remains under 78 Sqn control in the DA 'B' element. When remaining with within DA 'B' and therefore with RAD PTR can be cleared to operate as required not above FL195 / FL175 dependent upon the activation status of TRA 003:

a **TRA003 Not Active:** PTR may not operate above FL175 when TRA 003 is not active without coordination being achieved from both London Control (Swanwick) S10 Controller and Scottish Control (Prestwick) East Controller.

b **TRA003 Active:** PTR may operate up to FL195 without co-ordination.

23. **En-Route Departure from DA 'B' element.** Once PTR has vacated the DA 'B' element, 78 Sqn shall inform RAD that the DA 'B' element is vacated and PTR is established en-route at which point the DA 'B' element from FL105 to FL195 becomes *'Active but Cold'* and responsibility for it reverts to RAD. Where required to enable flexible use of airspace RAD and 78 Sqn may tactically agree an alternative airspace management agreement. The procedures for En-Route transits are outlined within Ref G and enable transits both within Class A (WASH CTA1 (Y70) crossings) and Class C airspace (TRAs).

24. **Pre-Recovery Requirements.** Upon notification of PTR's intentions to recover to either WAD or MRM, 78 Sqn will facilitate this transit and inform the relevant RAD at the earliest opportunity. 78 Sqn will prenote RAD with a DA entry time for which RAD will ensure the DA status is "*Active and Hot*" 15 mins prior. When RAD have ensured the DA is sterile from non-participating aircraft and established "*Active and Hot*" status; they will inform 78 Sqn and delegate airspace ownership for the entire DA 'B' element from FL105 to FL195. On receipt of a prenote, RAD are to

provide a Mode 3A Code and frequency. Where PTR's intentions are not to recover immediately and instead remain within the DA 'B' element for a period RAD are authorised to establish the DA 'B' element only as "*Active and Hot*". This will enable continued flexible use of airspace for the DA 'A' element in its *Active but Cold'* status. Dependent on the intentions of PTR, RAD will subsequently prenote ADC with the planned ATLC entry time and further intentions.

25. **Return into DA 'B' element from En-Route** On recovery, PTR will be approved to enter the DA 'B' element at FL190 and will be instructed to descend not below FL110. As PTR passes FL150 it will be handed from 78 Sqn to RAD. Airspace ownership of the entire DA 'B' element from FL105 to FL195 will then be returned to RAD.

26. **Transition from DA 'B' to 'A' elements.** Once established at FL110 within the DA 'B' element, PTR will be instructed to descend as required to re-position into the DA 'A' element. Once PTR has vacated the DA 'B' element, RAD shall inform 78 Sqn that the DA 'B' element is *'Active but Cold'* to enable flexible use of airspace. Where the DA 'A' element has remained *Active but Cold'* due to PTR remaining in the DA 'B' element for a period, RAD are to ensure that the DA 'A' is established as "*Active and Hot*" 15 mins prior to entry.

27. **Generic Recovery Flight Profile.** Further descent will be conducted in a spiral on the QFE and will be subject to other activity at the Aerodrome with the aim of achieving height 3500ft QFE before transfer to ADC for final descent profile. The recovery from FL100 will take approximately 10 minutes. Once PTR is in two-way comms with ADC, ADC will clear PTR to commence the ATLC recovery profile.

28. **Local Sortie Flight Profile.** There will also be occasions where PTR conducts local sorties and remains within either the DA 'A' element or the entire DA. On these occasions, delegation of control over the airspace will be managed tactically between RAD and 78 Sqn.

29. **WAD Radar Specific Requirements .** Whilst operating under the control of WAD Radar to aid with situational awareness the Mode 3A code 3634 will be utilised.

30. **WAD EGD324 B Specific Requirements.** EGD324 B includes an internal 3nm buffer zone running along the northern edge of the DA abutting with LIN-2 and LIN-3 CTAs (as per diagram below). The Protector RPAS will not be permitted to operate within this buffer zone without coordination with the Scottish Control (Prestwick) East Controller via 78 Sqn. This buffer zone will be displayed on the Radar map of the controlling agency.

Fig 3. EGD324 B Buffer

Emergencies

31. **Loss of RT.** In the event of a loss of satisfactory 2-way communication between ATC and PTR Operator(s), PTR is to either hold position if on the ground or continue iaw the current clearance if airborne and select Mode 3A code 7600 whilst communication is established via landline.

32. **Lost Link (within WAD and MRM DA).** In the event of a Lost Link, PTR will squawk 7400 and will follow the existing clearance to a point where they will hold for a prescribed amount of time before following the programmed recovery profile back to the designation aerodrome. The PTR Operator(s) will inform the relevant ATC agency of the programmed Lost Link profile, including both routings and timings. In the event this occurs whilst PTR is en-route and not within either the WAD or MRM DA, all standing agreements are suspended, and relevant DA airspace should be sterilised and amended to "*Active and Hot*" 30 mins in advance of planned PTR entry. Integration of other Mil aircraft with PTR in the DA should be limited to essential DA crossings only with crossings below a descending PTR or above a climbing PTR avoided.

33. **Lost Link Hold Period.** As a default the hold period will be a minimum of 15 mins, however where there is significant activity ongoing either at the designated aerodrome or in the local area, WAD, MRM and 78 Sqn reserve the right to request an increase to the hold period. Where possible this is to be included as part of the weekly OPG agreements however tactical amendments can be made. The maximum hold length available will vary dependent on PTR flight profile and intentions however PTR will endeavour to accommodate where possible.

34. **Lost Link Considerations.** Whilst recognised as an ATC Emergency to afford airspace priority, a Lost Link event does not directly constitute an aircraft emergency. However, a Lost Link scenario does prevent the PTR Operator(s) from amending pre-programmed routings and actively monitoring PTR's flight profile. Iaw Ref F it is therefore essential that the relevant ATC agency monitoring PTR inform the PTR Operator(s) should the actual PTR flight profile not align with the expected profile. Lost Link recovery profiles will consist of programmed profiles either established during the airborne sortie or outlined within Aerodrome Specific Op Orders for UK T3.

35. **Aircraft Emergencies.** In the event of PTR declaring an aircraft emergency, ATC should respond iaw standing procedures outlined within RA 3311. Any additional requirements will be outlined within Aerodrome Specific Op Orders for UK T3.

36. **Aircraft Emergency Considerations.** To facilitate aircraft emergency recoveries the aerodrome should consider the following, outlining procedures within Aerodrome Specific Op Orders for UK T3:

a. Removal of the TRC controller.

b. Sterilisation of Airfield Operating Surfaces (AOS).

c. Emergency State response.

RAFAT Specific Procedures for the WAD DA

37. **Airspace.** EGD324 A is also authorised for activation and utilisation by RAFAT to conduct display practices. Coordination and activation procedures will be conducted iaw standing PTR planning procedures, with activity will mostly occur Mon to Fri 0800L-1730 local but can also take place on weekends subject to prior approval.

38. **Concurrent RAFAT and PTR Activity.** If there is concurrent RAFAT display activity and PTR operations within the WAD DA, PTR will maintain within EGD324 B not below FL110 until RAFAT call complete. Upon confirmation of RAFAT's intentions, PTR will be instructed to descend into EGD324 A via a stepped descent profile to ensure vertical separation between RAFAT and PTR.

39. **RAFAT Activity Considerations.** As a result of the proximity of adjacent aerodromes, non-participating aircraft may require to transit close to the lateral boundaries of EGD324 A. RAFAT will be provided TI on such aircraft and RAFAT will endeavour to honour the boundary of the DA until the traffic is no longer relevant.

Application of LoA

40. The contents of this LoA should not prevent any pilot, air traffic controller or controlling authority from using discretion in the case of an emergency or to exercise a duty of care iaw CAP 774. The relevant parties shall be informed of any departure from the agreed procedure as soon as possible.

41. Permanent amendment to this LOA will only be affected with the written consent of all signatories. The agreed procedures will be detailed where necessary in signatories' unit order books and LOAs. This LOA is effective once signed by all signatories.

42. This LoA will be reviewed on the completion of Trial PREVALENT PHEONIX.

Signatories

Position	Rank / Name	Signature	Date
OC OSW, RAF Waddington	[redacted]		10 Sep 24
OC OSW, RAF Coningsby			12 Sep 24
OC OSW, RAF Marham			
OC 78 Sqn			10 Sep 24
OC 56 Sqn, RAF Waddington			9 Sep 24
OC 31 Sqn RAF Waddington			11 Sep 24

Appendix C: LoA Marham ATC - South Boughton (in draft)

5 Dec 23

LETTER OF AGREEMENT BETWEEN THE OWNER OF BOUGHTON (SOUTH) AIRFIELD AND ROYAL AIR FORCE MARHAM

1. The following Air Traffic Control procedures are agreed between Mr Warner and Royal Air Force Marham, covering the operation of aircraft into and out of private landing strip of Boughton (South), situated 4 miles south of RAF Marham:

   a. Royal Air Force Marham is published as an extended hours aerodrome. When open and within its capacity, RAF Marham, when requested will provide an Air Traffic Service to aircraft both into and out of Boughton (South) Airfield.

   b. Airspace users are to be aware that RAF Marham now operates from all 4 runways, Rwy01, Rwy05RH, Rwy19RH, Rwy23. Airspace users are to remain vigilant for fast jet traffic operating in the vicinity of RAF Marham MATZ.

   c. Pilots of radio equipped aircraft inbound to Boughton South Airfield are to attempt to contact Marham Zone on VHF 124.150 MHz as early as possible for their transit towards the Airfield, to enable early coordination of a MATZ transit with ATC. Likewise, aircraft departing Boughton South are requested to make every effort to contact Marham ATC via telephone prior to departure.

      i. When EGD### is NOTAM'd as active, pilots must not depart without a positive clearance from Marham ATC. Likewise, when recovering to Boughton South, pilots must not enter EGD### without a positive clearance from Marham ATC. Clearances can be obtained via the contact details on the NOTAM.

   d. Pilots of transponder equipped aircraft are requested to ensure that their mode 3A and C are switched on prior to departure from or recovery to the airfield. Non-transponder equipped aircraft are requested to telephone RAF Marham ATC prior to departure with a brief overview of their route or general handling requirements.

   e. Pilots of non-radio equipped aircraft requiring MATZ penetration are to clear their arrival and departure by telephone and on each occasion with RAF Marham ATC Supervisor on Narborough (01760) 444949.

   f. Should the airstrip accept visiting aircraft, the airfield owner will endeavour to ensure the visiting pilot is fully briefed on the agreement contained herein.

2. Signed on behalf of RAF Marham and by the owner of Boughton (South) Airfield.

[redacted]
Officer Commanding

[redacted]
Owner
Boughton (South) Airfield

Operations Support Wing
RAF Marham

Appendix D: LoA Marham ATC - North Boughton (in draft)

5 Dec 23

LETTER OF AGREEMENT BETWEEN THE OWNER OF BOUGHTON (NORTH) AIRFIELD AND ROYAL AIR FORCE MARHAM

1. The following Air Traffic Control procedures are agreed between Mr Coulten and Royal Air Force Marham, covering the operation of aircraft into and out of private landing strip of Boughton (North), situated 4 miles south of RAF Marham:

   a. Royal Air Force Marham is published as an extended hours aerodrome. When open and within its capacity, RAF Marham, when requested will provide an Air Traffic Service to aircraft both into and out of Boughton (North) Airfield.

   b. Airspace users are to be aware that RAF Marham now operates from all 4 runways, Rwy01, Rwy05RH, Rwy19RH, Rwy23. Airspace users are to remain vigilant for fast jet traffic operating in the vicinity of RAF Marham MATZ.

   c. Pilots of radio equipped aircraft inbound to Boughton North Airfield are to attempt to contact Marham Zone on VHF 124.150 MHz as early as possible for their transit towards the Airfield, to enable early coordination of a MATZ transit with ATC. Likewise, aircraft departing Boughton North are requested to make every effort to contact Marham ATC via telephone prior to departure.

      i. When EGD### is NOTAM'd as active, pilots must not depart without a positive clearance from Marham ATC. Likewise, when recovering to Boughton North, pilots must not enter EGD### without a positive clearance from Marham ATC. Clearances can be obtained via the contact details on the NOTAM.

   d. Pilots of transponder equipped aircraft are requested to ensure that their mode 3A and C are switched on prior to departure from or recovery to the airfield. Non-transponder equipped aircraft are requested to telephone RAF Marham ATC prior to departure with a brief overview of their route or general handling requirements.

   e. Pilots of non-radio equipped aircraft requiring MATZ penetration are to clear their arrival and departure by telephone and on each occasion with RAF Marham ATC Supervisor on Narborough (01760) 444949.

   f. Should the airstrip accept visiting aircraft, the airfield owner will endeavour to ensure the visiting pilot is fully briefed on the agreement contained herein.

2. Signed on behalf of RAF Marham and by the owner of Boughton (North) Airfield.

[redacted]
Officer Commanding

[redacted]
Owner
Boughton (North) Airfield

Operations Support Wing
RAF Marham

Appendix E: LoA Marham ATC - East Winch (in draft)

5 Dec 23

LETTER OF AGREEMENT BETWEEN THE OWNER OF EAST WINCH AIRFIELD AND ROYAL AIR FORCE MARHAM

1. The following Air Traffic Control procedures are agreed between Ms/Mrs/Miss Burman and Royal Air Force Marham, covering the operation of aircraft into and out of private landing strip of East Winch, situated 5 miles north of RAF Marham:

   a. Royal Air Force Marham is published as an extended hours aerodrome. When open and within its capacity, RAF Marham, when requested will provide an Air Traffic Service to aircraft both into and out of East Winch Airfield.

   b. Airspace users are to be aware that RAF Marham now operates from all 4 runways, Rwy01, Rwy05RH, Rwy19RH, Rwy23. Airspace users are to remain vigilant for fast jet traffic operating in the vicinity of RAF Marham MATZ.

   c. Pilots of radio equipped aircraft inbound to East Winch Airfield are to attempt to contact Marham Zone on VHF 124.150 MHz as early as possible for their transit towards the Airfield, to enable early coordination of a MATZ transit with ATC. Likewise, aircraft departing East Winch are requested to make every effort to contact Marham ATC via telephone prior to departure.

      i. When EGD### is NOTAM'd as active, pilots must not depart without a positive clearance from Marham ATC. Likewise, when recovering to East Winch, pilots must not enter EGD### without a positive clearance from Marham ATC. Clearances can be obtained via the contact details on the NOTAM.

   d. Pilots of transponder equipped aircraft are requested to ensure that their mode 3A and C are switched on prior to departure from or recovery to the airfield. Non-transponder equipped aircraft are requested to telephone RAF Marham ATC prior to departure with a brief overview of their route or general handling requirements.

   e. Pilots of non-radio equipped aircraft requiring MATZ penetration are to clear their arrival and departure by telephone and on each occasion with RAF Marham ATC Supervisor on Narborough (01760) 444949.

   f. Should the airstrip accept visiting aircraft, the airfield owner will endeavour to ensure the visiting pilot is fully briefed on the agreement contained herein.

2. Signed on behalf of RAF Marham and by the owner of East Winch Airfield.

[redacted]
Officer Commanding

[redacted]
East Winch Airfield

Operations Support Wing
RAF Marham