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ACP-2020-042 Future Combat Airspace Trial Final Report

Introduction and Background

The Ministry of Defence (MoD) has identified a requirement for the generation of new, suitable and safe airspace in the UK to run large scale live exercises, allowing modern military aircraft and systems to integrate with each other and train to their full capabilities. The current existing airspace structures do not provide the MoD viable airspace to facilitate this essential training. An airspace sharing agreement with NATS had been used in the past to facilitate this MoD activity; feedback from recent iterations had however demonstrated that this airspace sharing agreement was untenable for all parties.

The previous agreement also did not incorporate other airspace users and as such, an Airspace Change Process (ACP) – **ACP-2020-026** - has been submitted, under CAP1616, to deliver a permanent airspace solution. In order to identify, investigate and test concepts to support ACP-2020-026, the MoD also launched this Future Combat Airspace (FCA) trial – **ACP-2020-042**, which is the subject of this report.

The Trial ran in 2 stages – the first coincident with Ex CRIMSON WARRIOR in Oct-Nov 20 and the second coincident with Ex COBRA WARRIOR in Mar 21. The concurrence of the Trial with the large exercises is not a coincidence; MoD needs airspace to deliver its collective training and large scale exercises provide the ideal opportunity to test the design while the airspace and its management is 'loaded' with a high number of participants.

The Trial enabled real time testing of Airspace Management (ASM) concepts as well as finessing the design of the physical airspace structures and air traffic management (ATM) procedures required to deliver and support this change. The data gathered and the resulting analysis will feed into ACP-2020-026 to support the establishment of a permanent, lasting airspace solution.

The dimensions of the Trial airspace volumes differed between Stages 1 and 2, largely due to the short time available between trial inception and delivery of Stage 1. The Stage 1 airspace was designated Temporary Danger Area (TDA)598 (Fig.1) and Stage 2 TDA597 (Fig.2). The ways these TDAs were notified, activated and managed were also different, with clear improvements in every respect planned for, and observed, in Stage 2.

The Trial ACP sponsor was Officer Commanding 92 Sqn, Air and Space Warfare Centre, RAF Waddington.

Statement of Need, Core Military Requirements and Key Principles

The MoD submitted the following **Statement of Need** for the Future Combat Airspace:

> 'Air Command, on behalf of the Ministry of Defence, has an obligation to provide relevant tactical collective training to its combat and combat support forces to ensure UK Forces are

correctly prepared to defend UK interests in line with the UK Defence Strategy. An appropriate airspace that can safely facilitate exercising large forces of modern and future aircraft, in a representative combat environment is required to meet this need.'

These are the **Core Military Requirements** for the Trial airspace:

Minimising the risk of MAC to the maximum extent whilst enabling:

Full tactical employment of aircraft and weapons capabilities

Supersonic flight and rapid height changes

Overflight and loiter of rural overland (target) areas

Concurrent high and low altitude activity

Representative employment ranges of simulated air-air and air-surface weapons

Representative operational numbers of aircraft

Ability to oppose from ground and air simultaneously

Contested in electromagnetic environment

These were the **Key Principles** for the Trial:

The FCA will be within practical reach of RAF/USAFE Main Operating Bases (ie. not unduly extending sortie lengths to get there and back.)

The FCA design will provide a suitable training area to meet core requirements now and in the near future, which cannot be achieved in the current airspace structure.

The FCA will provide a sufficient overland portion for running tactical scenarios, siting targets and simulated threats that facilitate representative collective training.

The FCA design must be safe, with any hazards identified and risks mitigated such that they are tolerable and as low as reasonably practicable.

Management of the FCA will use Flexible Use of Airspace (FUA) principles wherever possible.

The FCA will minimise impact upon the network and other airspace users, where possible.

The FCA will use existing structures and procedures where possible to maximise simplicity and conformity.

Airspace Design

The design of each TDA is shown below, with accompanying notes to highlight key details and differences

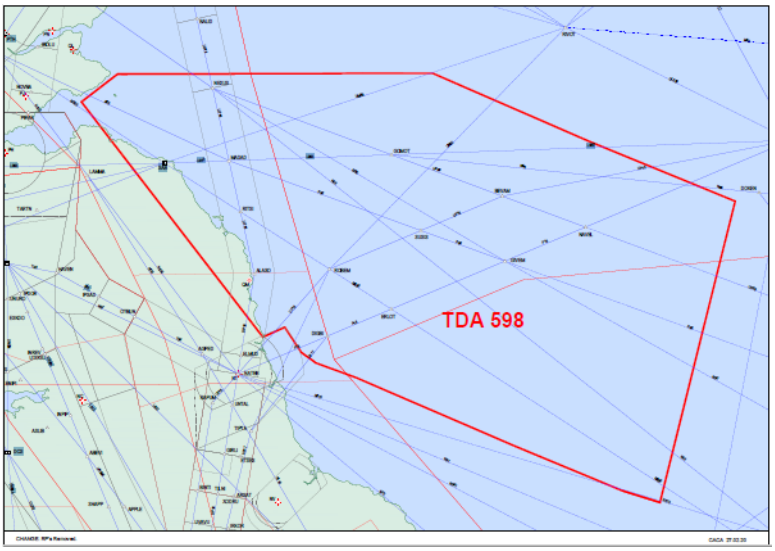

Fig. 1 ACP-2020-042 Stage 1 (TDA598)

TDA 598 Key Details

FL85-660 Segregated

Limited overland area

Not AMC managed

Notified by AIC

Activated by NOTAM

Required significant NATS tactical control and manual processes with EUNM to make viable

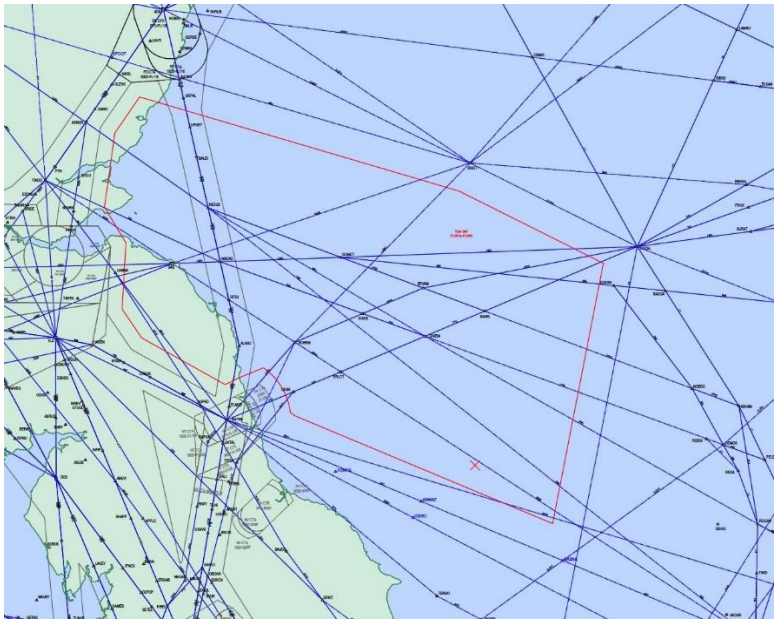

Fig. 2 ACP-2020-042 Stage 2 (TDA597)

TDA 597 Key Details

FL85-660 Segregated

Much greater overland area

AMC managed

Activated by NOTAM

Fully visible to EU NM

Introduced Flight Plan Buffer Zone for Free Route compliance

Enhanced Network connectivity and automatic FPL acceptance

Trial Results

Overall the Trial was a great success and produced the following headline **results**:

- Creation of a safe, operationally viable airspace volume (TDA597), with full Network visibility and a standardised activation process, which fulfils **most** of MoD's requirements for running large-scale tactical training exercises.
- A set of ASM and ATM protocols which are working very well between civil and military sectors and which are compatible with future Free Route airspace requirement and plans.
- *Indicative* data of a net environmental benefit due to concurrent suppression of existing MDA structures to permit TDA597 activation.
- A consolidated set of established stakeholder relationships to take forward into ACP-2020-026.

A full description of Trial Objectives and Results from both Stages 1 and 2, as well as stakeholder feedback is at **Annex A**.

The Trial also produced the following headline ongoing **issues**:

- Low civil traffic levels due to the COVID-19 pandemic significantly reduced the validity of data gathered in almost every respect during the Trial, leading several stakeholders to question Trial validity and request more data gathering and analysis.

- No lasting solution for the provision of Air Traffic Services to civil traffic arriving at or departing from Newcastle International (NIAL) and Durham Tees Valley (DTV) airports.

- A requirement for some military exercise traffic (fast-jets, air-air refuelling (AAR) and some Intelligence, Surveillance and Reconnaissance (ISR) aircraft) to operate outside the Ex airspace (laterally and vertically), thereby increasing the chance of interaction with passing civil traffic.

Each of these issues will be dealt with below.

Issue 1 - Impact of COVID-19

ACP-2020-042 has coincidentally, and unfortunately, mirrored the COVID-19 pandemic in time almost exactly. The resulting drastic reduction in civil traffic has had a serious effect on the validity of the Trial, because while the MoD has been able to 'load' the airspace volumes with a representative number of exercising aircraft, the impact on the civil sector has been impossible to validate.

Almost all airspace stakeholders stated in both Stages 1 and 2 feedback that low civil traffic levels due to COVID-19 were affecting any conclusions that could be drawn from the Trial about the impact to civil operations of TDA597 activation. In some cases these opinions were strongly phrased.

The Change Sponsor recognises these points of view, but ultimately there is a current and future State requirement for the MoD to train for multi-domain warfighting operations in suitable airspace volumes. Thus the Trial continued (as has another ACP to use TDA597 twice more before ACP-2020-026 completes) in this unrepresentative low traffic environment.

Most stakeholders have also requested that future activations of TDA597 are used to gather data as civil traffic levels return to normal levels. While not under the auspices of the Trial, MoD support this request and NATS have agreed to gather and analyse data in this way.[1]

Issue 2 - Provision of ATS to NIAL and DTV traffic routing to Copenhagen FIR

Provision of Air Traffic Services to NIAL and DTV traffic was one of the issues which led to the cessation of the previous airspace sharing agreement (the CACA) and the inception of this series of ACPs. With the Trial airspace in place, there is no network linkage between these airfields and the Copenhagen FIR. As a result, the Change Sponsor and NATS proposed a volume of Temporary Controlled Airspace (T-CAS) called the Flamborough CTA to offer these aircraft protection and a routing option along the southern edge of the Trial airspace.

[1] Agreed at TDA597 Planning meeting held on MS Teams on 25 May 21.

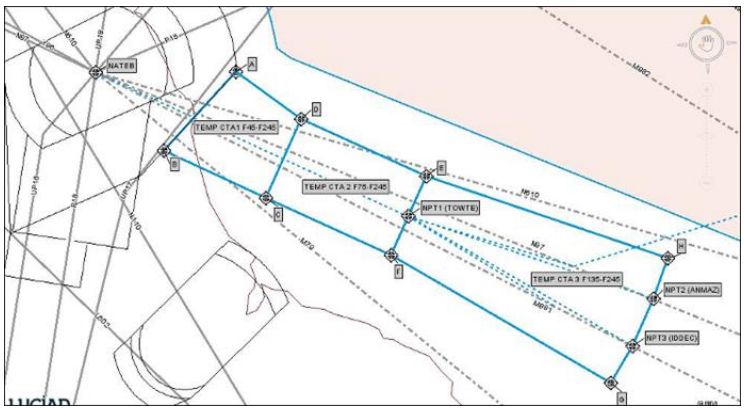

Fig 3. Proposed Flamborough CTA T-CAS structure

This part of the Trial Proposal was however turned down by the CAA prior to Stage 1, due to the low traffic volumes expected during both Stages of the Trial not justifying the creation of a new volume of CAS. As such, the only option available to make the Trial viable was for RAF(U) Swanwick to provide services to these aircraft, which they agreed to do with an equal priority afforded to military Exercise traffic.[2]

This solution is deemed not viable in the long term and will need solving as part of ACP-2020-026.

Issue 3 - Exercise Traffic Outside the Trial Airspace

Several stakeholders commented on the presence of military Exercise traffic operating outside the Trial airspace. This traffic can largely be grouped as follows:

- Traffic entering and leaving the TDA at the start and end of their mission.
- AAR aircraft holding outside and fast-jet receivers arriving and departing.
- Fast-jet traffic flying underneath the TDA.
- Rotary-wing traffic flying in the Ex, but not using the TDA at all. Usually routing via Spadeadam (D510) and Otterburn (D512).

While the presence of these aircraft was planned for and communicated prior to the Trial (and there were no serious safety concerns as a result), there is a clear lesson identified for MoD to take forward into ACP-2020-026 that as much Exercise traffic as possible should be enclosed within the Ex airspace for as long as possible. It should however be noted that there will always be a requirement for military Exercise traffic to operate outside whatever airspace volume ACP-2020-026 produces. It is therefore incumbent on MoD Exercise delivery agencies (such as 92 Sqn, ASWC) and Battlespace Management organisations to brief civil airspace users carefully on planned military excursion from segregated airspace.

Summary

Born out of a requirement to generate airspace at short notice for a high-priority MoD Exercise after the demise of the CACA, ACP-2020-042 has not only yielded great results in terms of the collective training achieved, but also in terms of the airspace volume created (TDA597) and the procedures and processes which enable its use. It is too early to say whether this airspace will be the chosen solution for ACP-2020-026, but it is indisputable that we have learnt much during its creation, development and eventual use in March this year.

[2] It should be noted that there were in fact no aircraft requiring this service during any Stage 1 or Stage 2 Trial activation.

As Trial Sponsor, I would like to extend my personal thanks t [redacted] for all their hard work in supporting me through this process and getting this project up and running and setting the conditions for an eventual successful outcome of ACP-2020-026.

Officer Commanding 92 Sqn / ACP-2020-042 Trial Sponsor
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Annex:

A: ACP-2020-042 Trial Final Report – Stage 1 Feedback
Stage 2 Feedback
Trial Methodology, Objectives and Results