Airspace for Tomorrow 3

Modernising the United Kingdom's airspace arrangements in a safe, sustainable and efficient way

Overview

This is the third in this series of documents that the CAA intends should give all those with an interest in the way we use UK airspace, the background to the production of the Future Airspace Strategy (FAS) that is available at www.caa.co.uk/FAS. The FAS was developed in conjunction with colleagues from the Ministry of Defence, NATS, and the Department for Transport (DfT); it incorporates feedback from the stakeholder consultation process.

This document is intended to help you:

- Become better informed on what the FAS is and how work to achieve the FAS vision is being progressed by the CAA and others.
- Have a clearer understanding of the key areas for consideration, the potential judgements to be made in terms of the optimum solutions, having regard for all the potential outcomes, and the technical improvements that could be made.
- Gain a better understanding of the potential benefits of modernising the UK's airspace system.

Introduction

Airspace for Tomorrow 3 provides an update to the FAS development work, including a summary of the consultation process. It sets out how the work to achieve the FAS vision will be managed and driven forward by considering:

- The FAS Consultation.

- Managing the FAS Programme.

- FAS Collaboration – why is it important?

- The FAS today.

What is the FAS?

The FAS aims to enable a modernised air traffic management system that provides safe, efficient airspace, that has the capacity to meet reasonable demand, balances the needs of all users and mitigates the impact of aviation on the environment.

The FAS Consultation

The draft FAS document was published for consultation between 1 November 2010 and 7 February 2011, with a further Stakeholder Workshop being held in March 2011. The consultation responses covered a range of views and issues associated with the FAS and many of them also provided comment on implementation actions, or focused on specific issues, rather than airspace strategy in the round. Where responses were focused on location specifics, the comments were extrapolated for consideration at the strategic level. Implementation issues and specific airspace design considerations will nevertheless still need to be taken into account during any implementation programmes associated with the FAS.

Overall, the consultation responses provided a range of views on the topics covered in the FAS and the CAA's Consultation Response Document (available by the link given or by going to www.caa.co.uk/FAS) delineates which of the consultation issues raised are under the remit of the CAA and those which are the result of statute and Government Guidance. The CAA will continue to engage with stakeholders as the FAS implementation work is taken forward. A number of themes in the consultation responses will need further work and this will be guided, prioritised and monitored by the FAS groups explained overleaf.

Managing the FAS Programme

The CAA and its partners in the FAS will manage the programme of work by providing a governance structure for the Strategy and its associated implementation work by using the following groups:

FAS Oversight Group

The FAS Oversight Group is chaired by the Chief Executive of the CAA, with the Director General Civil Aviation from the Department for Transport, the Chief Executive NATS, the Assistant Chief of the Air Staff from the Ministry of Defence and the CAA's Director of Airspace Policy (DAP) as members. The President of the General Aviation Alliance has joined the Oversight Group to provide expert advice on this important sector of the aviation community. The chair of the FAS Programme Board and one of the co-chairs of the FAS Industry Implementation Group (FASIIG) are also in attendance. The group meets every six months and is responsible for the successful development of the UK airspace system to achieve the benefits envisaged in the FAS. It provides the high-level assurance and governance of the development of the Strategy and oversight of operational delivery. It also owns and communicates the aspirations set out in the Strategy across the aviation sector. The FAS Oversight Group will keep the CAA Board and the Department for Transport's Aviation Board fully informed of the progress of the work to achieve the FAS vision.

FAS Programme Board

The FAS Programme Board reports directly to the FAS Oversight Group. The Programme Board is made up of technical experts, Government Representatives and FAS workstreams leads. It is chaired by the CAA's Assistant Director of Airspace Policy and includes members from NATS, the Department for Transport and the Ministry of Defence, as well as representatives from the Safety, Legal, Environmental and Regulatory Policy areas of the CAA. The FAS Programme Board meets on the first Thursday of each month and is responsible for the maintenance and refinement of the contents of the FAS and communicating any significant changes to stakeholders. It is also responsible for ensuring that the implementation programme is coherent with, and delivers on, the aspirations set out in the Strategy.

One of the important areas that the FAS Programme Board considers each month is the Risk Management associated with the Strategy. The risks initially identified in the FAS Strategy Document have been developed and consolidated. The risks to the Strategy were then considered in turn and allocated to a Risk Owner and a Risk Manager before appropriate mitigations were developed by the Risk Manager. The Risk Register and the effectiveness of mitigation measures are reviewed as a standing agenda item at the FAS Programme Board meetings.

FAS Industry Implementation Group (FASIIG)

An Industry Implementation Group (FASIIG), co-chaired by BAA and NATS, has been formed with membership from across the aviation community.
The FASIIG meets quarterly and has the primary purpose of working collaboratively across the aviation industry to develop and agree a 'FAS Implementation Master Plan' which will deliver a set of tangible benefits within the 2015-2020 timeframe or earlier where possible. The Plan will be developed, agreed and submitted to the FAS Oversight Group by December 2012.

Organising the work of FASIIG

The detailed work of the FASIIG is currently being undertaken in three working groups. Each group has appropriate members and expertise drawn from across the FASIIG. The 3 working groups are:

- Regulatory and Government Policy.

- Airspace and Procedures.

- Airports.

The working groups are responsible for developing detailed plans and commissioning and co-ordinating work by the appropriate organisations. The working groups will work together to ensure that the delivery of change is aligned across the aviation community.

Developing the FASIIG 'Master Plan'

The Master Plan needs to be focused on the delivery of improvements to air traffic management in the period to 2020. Improvements will be delivered by a framework of work packages that support the FAS Vision. In effect the 'Master Plan' will represent the UK's approach to meeting the Single European Sky requirements. The potential work packages are illustrated in the diagram below but these may change as overall development of the FAS continues.

Each 'package' will capture a mix of ATM, airborne and airport capabilities required to enable improvements, including an indication of where and when they will be implemented.

Delivering the necessary airspace, technology and capabilities will rely upon projects undertaken by different organisations but all working to the 'Master Plan'. The FASIIG will also consider where policy and regulatory changes may be required to facilitate implementation of the proposed developments.

The implementation of the FAS will necessarily be an iterative process so these arrangements may need to change as work progresses.
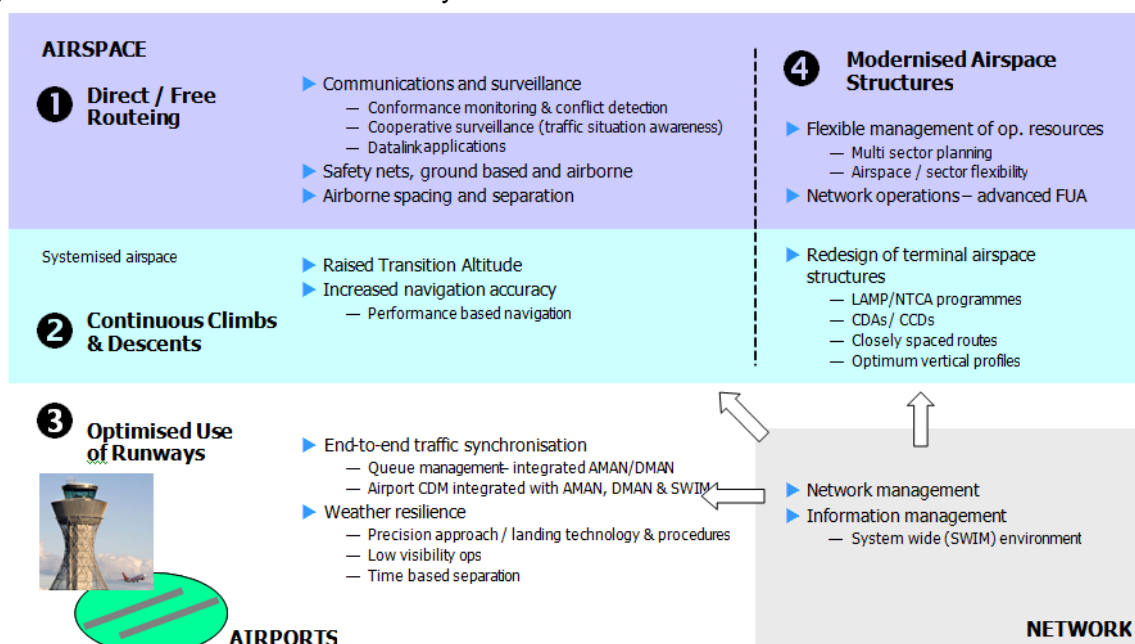
Ensuring safe, balanced and effective decision making and implementation

A business case approach is being developed to ensure that the 'Master Plan' creates a workable and economic UK airspace system that delivers capabilities with demonstrable cost-benefits to airspace users.

FASIIG and its working groups will look to quantify the benefits of each of the 'packages' in the following key areas:

- A reduction in safety risk, or at least maintaining current levels of safety while enabling benefits in other areas.

- Environmental benefits by reducing total aircraft CO_2 emissions and the noise impact of aircraft operations.

- Airspace capacity benefits to safely and efficiently accommodate traffic using emerging technologies.

- Cost benefits through operating in more cost effective ways.

The approach taken will consider the commercial feasibility and investment timescales for different organisations of implementing proposed changes and hence the vital coordination role that the FASIIG needs to play. It will seek to harmonise industry's investment plans by deploying solutions when they are needed against agreed priorities and benefits.

FAS National Air Traffic Management Advisory Committee (NATMAC) Sub-group

The National Air Traffic Management Advisory Committee (NATMAC) is the principal consultation body for the Directorate of Airspace Policy. The purpose of the FAS NATMAC Sub-group is to enable stakeholder engagement in, and an overview of, the FAS, its development and implementation. The Sub-group will also provide a check function, and provide challenge, to the work of the FAS Programme Board to confirm that on-going work is coherent with the aims and the aspirations of the published Strategy. They will also help

support the work to define the requirements for Class G airspace for the 21st Century, detailed on page 9. The Sub-group included the following organisations:
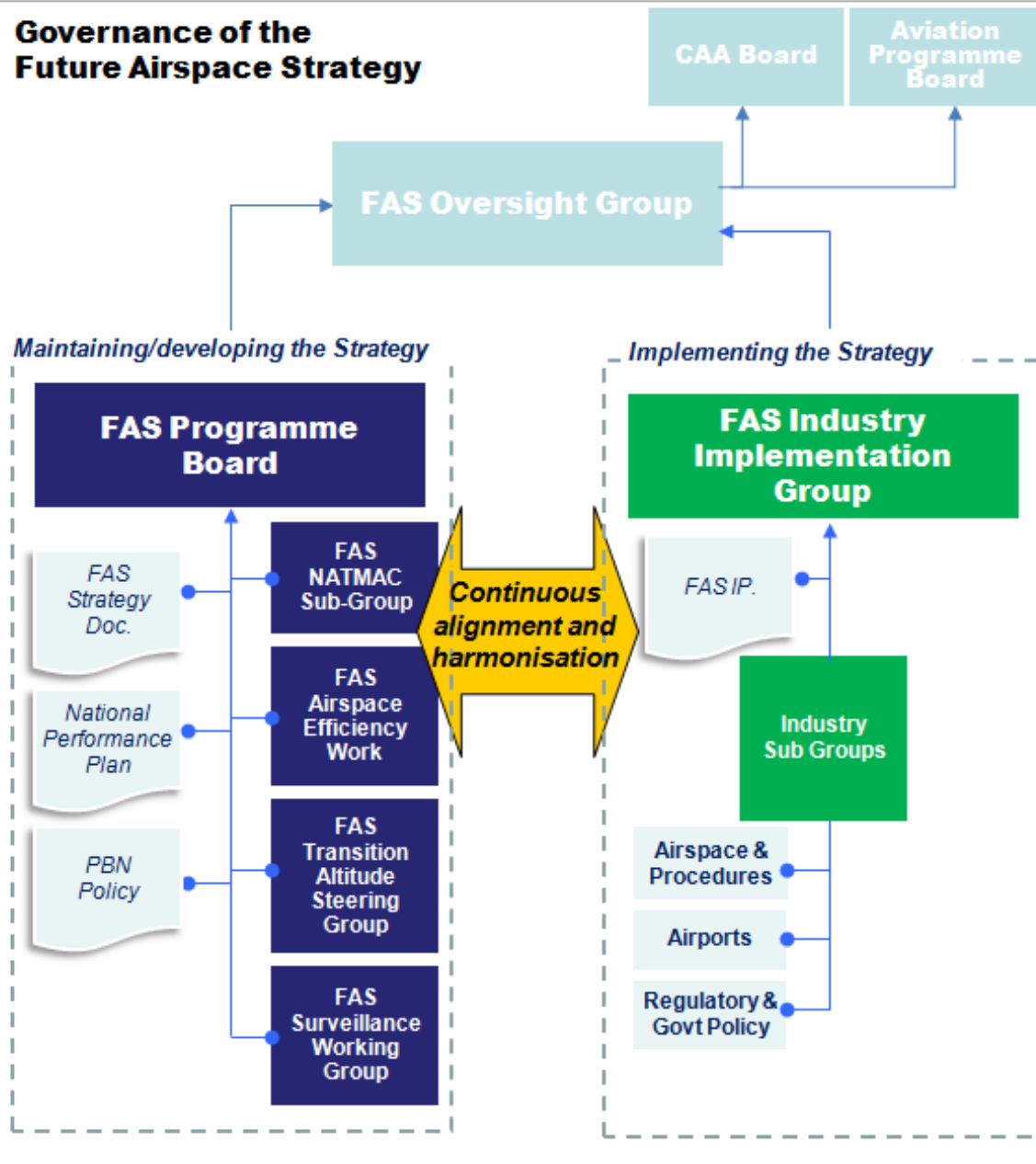
CAA
BA representing Heavy Airlines
BAA
BALPA
BBAC
BGA
BHA
EasyJet representing Low Cost Airlines
LAA
Military Aviation Authority
NATS
PPL/IR Europe
UAVS Association

FAS Governance Diagram

The FAS Governance Groups and relationships can be seen in the diagram on page 6.

Governance of the Future Airspace Strategy

FAS Oversight Group (FASOG)

Attendance: CEO CAA (chair), DGCA (DfT), CEO NATS, Deputy Head RAF MoD, President LAA, DAP. Chair FASPB and FASIIG in attendance.

Frequency: 6 monthly.

Terms of Reference: Responsible for the successful development of UK airspace system to achieve the benefits envisaged in the FAS. Provides assurance and oversight of the development of the FAS and the implementation of proposed changes. Owns and communicates the aspirations set out in FAS across the aviation sector.

FAS Programme Board (FASPB)

Attendance; CAA Chair, NATS, DfT, MoD, IAA, CAA Safety, Legal ERCD, RPG reps, FAS Coord.

Frequency: monthly.

Terms of Reference: Maintain and refine the contents of the FAS, communicate changes to stakeholders. Ensure the implementation programme is coherent with, and delivers on, the aspirations set out in the strategy.

FAS Industry Implementation Group (FASIIG)

Attendance: NATS & BAA co-chair, ANSPs, Airports, Airlines, Aircraft Manufacturers, CAA, IAA and MoD.

Frequency: Quarterly or as appropriate.

Terms of Reference: Objective to develop a jointly agreed FAS Implementation Plan by December 2012. Owns, and drives progress against, the FAS implementation programme. Ensures alignment between the delivery plans of the various parties responsible for implementing changes. Manages the overall cost-benefit case.

FAS Collaboration – why is it important?

Many of the projects that will support the achievement of the FAS Vision are not under the authority of one organisation. The only way unified progress can be made is through cooperation and collaboration. FASIIG will need to work collaboratively across the aviation community if it is to achieve the desired results. This Group will be the engine of the FAS and it has been established as a collaborative undertaking between air navigation service providers, airlines, airports, Ministry of Defence, Business Aviation, GA, other aviation community stakeholders and the CAA. The Group aims to work in partnership towards developing a jointly agreed implementation plan to deliver the FAS in the medium to long term (2015-2020). The plan will include implementation of technology, procedures, airspace changes and the associated policy framework to deliver improvements to safety, capacity, environmental performance and Air Traffic Management efficiency required by the FAS. The FASIIG work will need to be progressed and delivered in light of and coherent with the Government's emerging work on 'A Sustainable Aviation Policy'.

The requirement for cooperation and collaboration goes further than just the UK, as some of the issues that will need to be resolved are not just limited to the UK. Those organisations working in Europe and further afield, will need to ensure the UK and the FAS are aligned and consistent with Europe. A good example of the need for this cooperation can be seen in the UK/Ireland Functional Airspace Block (FAB)[1] work which continues to be developed in line with the European Commission's Single European Sky initiative.

This collaborative approach to the Strategy will have many benefits, some of which are:

- Reaching agreement with aviation stakeholders on a plan for the future and the tangible outcomes that need to be delivered.

- Providing industry with the opportunity to influence current and future policy positions across the CAA and Government.

- Recording agreed outcomes whilst monitoring and measuring progress towards the objectives.

- Enhancing consultation, communication and trust between all key aviation stakeholders who have a role in delivering a shared future.

- The mutual sharing of relevant data and plans. Developing an open and transparent forum whereby airports and airlines feel they can share information.

- Facilitating robust, open discussions on strategic ATC operational issues to the benefit of all concerned.

- To help aviation stakeholders to understand the influences affecting airspace demand and capacity.

- To develop a greater understanding of future requirements and constraints across all parties.

- To support the objective of FABs, Single European Sky (SES), SESAR and NextGen (the USA equivalent to SESAR and FAS).

- Reach consensus on how best to deploy the FAS and thereby exploit the benefits of new (and existing) technology and techniques.

In order for this partnership approach to remain effective, all parties will need to be mindful of the need to represent all stakeholders within FASIIG. The Group will only continue to be successful if all parties remain committed to the FAS objectives and vision.

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[1] A FAB is an airspace block based on operational requirements and established regardless of State boundaries, where the provision of air navigation services and related functions are performance-driven.

The FAS Today

Today, a number of projects are already being progressed under the FAS banner and these include:

Assessing Efficiency in Airspace Terms

An important issue recognised in the FAS is the concept of airspace efficiency and how it might be used in helping to guide and manage trade-off decisions as the airspace system changes. In considering airspace changes, in line with the process set out in CAP 724 and 725, the CAA's Directorate of Airspace Policy (DAP) must judge how the benefits from the approval of any additional airspace measure against the financial costs and broader economic impacts, such as environmental effects and the impacts on green house gas emissions. Within the UK, other bodies such as air navigation service providers, airports and airlines also have important roles to play in relation to airspace efficiency.

The FAS work is seeking to promote a broader understanding of airspace efficiency where, once safety of the airspace system is assured, the costs and benefits associated with delays, the environment, access, users, suppliers and competition are assessed in a balanced way. Achieving efficiency is fundamentally about balancing competing factors. As part of the next phase of FAS work the CAA will take forward development of a practical cost-benefit framework for assessing the impact on overall airspace efficiency of proposed airspace changes and for highlighting trade-offs across the different factors. While the long-term ambition will be to quantify as many impacts as possible, it is clear that for many factors, particularly those relating to the use of uncontrolled airspace, there is currently insufficient data to support robust quantification. Accordingly, the framework will be designed in such a way that it provides an appropriate balance between quantitative and qualitative inputs.

Development of a robust assessment framework will improve the quality of the decision support information available to DAP in making airspace change decisions. It will also result in a more transparent process that gives greater clarity and certainty to all relevant parties involved about the basis and the information on which decisions are taken. Whilst acknowledging that airspace change decisions cannot be reduced to a purely numerical formula, a more systematic process, which includes a broader understanding of airspace efficiency and a greater degree of quantification, will help ensure the optimum outcome.
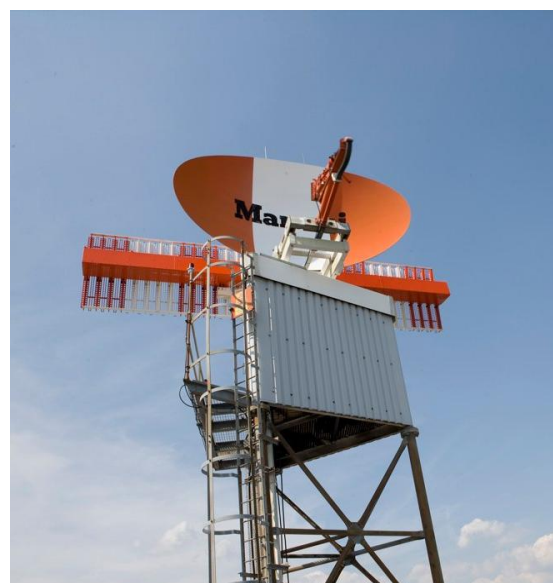
Class G Airspace

Comments received during the consultation phase of the Future Airspace Strategy correctly highlighted that the starting point for the strategy work had been focussed on the need to address airspace capacity such that it should not become a constraint to any permitted future commercial air transport growth. Based on the Government's published UK Aviation Forecasts[2] and notwithstanding the current economic crisis, demand for commercial air transport will rise and the UK airspace must be in a position to respond to that growth when and where it is permitted by government. The FAS also recognises that the needs of other airspace users, such as the general aviation community and the military also need to be taken into account; indeed, the CAA's statutory duties require this to be the case.

As a consequence, the CAA has initiated a package of work to look at the airspace regime in which general aviation and military activity predominates (largely the current Class G environment) in order to ensure that this is also fit for purpose in the 21st century and is optimised to meet the needs of its users, both in isolation where there is no interaction with commercial air transport and at the touch points where one activity impacts on the other or has a significant potential to do so (for example at the boundaries of controlled airspace around our major airports).

The National Air Traffic Management Committee (NATMAC) is the national body that is the primary means of consultation for the Director of Airspace Policy. It is constituted from a broad cross-section of airspace user groups and other interested parties and these include representatives of all Class G airspace users. A NATMAC sub-group has been created to address matters arising from FAS and it has been determined that this group is well placed to consider the 21st century class G requirements under the FAS banner. The aim will be to consider the needs of the disparate airspace users within this community and to consider how their differing requirements can best be delivered in future, while maintaining or enhancing the safety of all operators and not imposing overly burdensome restrictions or equipment carriage requirements. The first activity for this group is to consider the ideal operating parameters for their particular activity (such as gliders, balloons, hang gliders, microlights, commercial air transport, those conducting aerial work or the military) in the Class G environment and try to determine what is in the art of the possible having regard for likely future aircraft and ground infrastructure capabilities.

This work will also contribute an important component of the UK State Safety Plan that is currently being drafted for publication during 2012.

Performance Based Navigation (PBN) Policy

What is PBN?

PBN is the broad term used to describe the technologies that allow aircraft to fly flexible, accurate and repeatable three-dimensional flight paths using onboard equipment and capabilities based on GPS navigation technology.   PBN specifies the aircraft and system performance requirements in terms of accuracy, integrity, continuity and functionality. It has been described as re-engineering the way we fly and has the potential to unlock many of the safety, efficiency and capacity targets facing the aviation industry. For example airlines using PBN procedures at Atlanta have annually saved 700,000 US gallons of fuel and reduced carbon emissions by 6,700 tons each year[3]. The European Commission is minded to develop an Implementing Rule in this area in due course, although the timeframe, as currently envisaged, is longer than required to develop the necessary enhancements in UK airspace.

The FAS can only provide the future framework for change. In order to realise the necessary changes, the application of technical and operational enablers will be key. Amongst these, the specifications associated with the ICAO Performance-based Navigation (PBN) Concept offers significant opportunities for future airspace development.

The implementation of PBN as a design tool is principally a matter for the air navigation service providers. However, selection of an ICAO PBN specification and how it should be applied is critical to the ordered evolution of any airspace system and for that, regulatory policy and guidance are required to set the parameters around which PBN may be used.

This link will take you to the recently published Policy for the Application of Performance-based Navigation in UK/Irish Airspace.

PBN in a FAS Context

PBN is an essential component of delivering the objectives underpinning the FAS and consequential modernisation of the UK airspace system. Modernisation envisages transition from airspace, routes and instrument flight procedures, predicated on conventional navigation systems to an airspace described in terms of navigational performance standards. This provides the opportunity for a significant airspace re-design, especially of the UK's terminal airspace structure, which will enable the Air Traffic Management system to be modernised and deliver a series of environmental, capacity and efficiency benefits.

PBN is therefore laying the foundations for the airspace system not just of tomorrow, but for years to come as future navigation developments such as three-dimensional (3D) and four-dimensional (4D) user preferred trajectories evolve.

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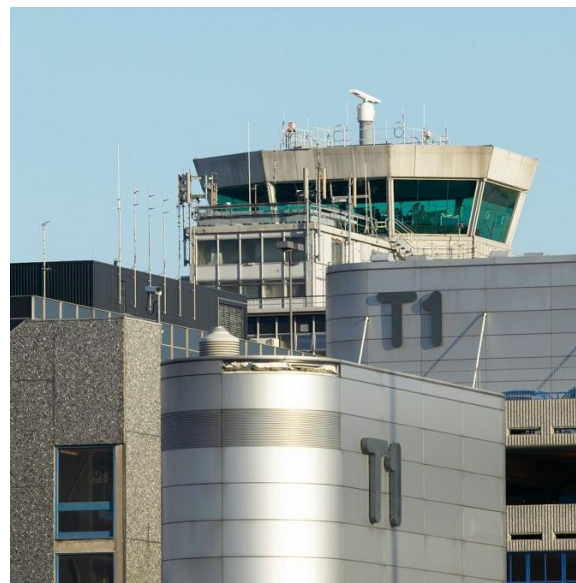
[3] Avionics Magazine, 1 February 2011, Preparing for PBN, Frances Fiorino.

Transition Altitude (TA) Harmonisation

TA[4] – An Explanation

Perhaps the best way to understand TA is to consider the example of a departure from an airfield:

At the airfield, the TA is promulgated at 3,000ft. The pilot on departing that airfield is required to set the local atmospheric pressure on his altimeter. By so doing, the altimeter will indicate the aircraft's height above mean sea level. The pilot knows that his airfield is 500ft above sea level and by deducting 500ft from the indication on his altimeter, he knows his height above the airfield and surrounding obstacles as the aircraft climbs away (i.e. when the altimeter indicates 2,000ft the pilot will know that, in this case, the aircraft is 1,500ft above the ground).

Once above 3,000ft the pilot is required to set the ICAO standard pressure, as height above the ground is now less important than the aircraft's position relative to other aircraft in its vicinity. As all aircraft above 3,000ft will be using the same standard setting, the risk of aircraft that might be on different settings (e.g. coming from a different area some distance away) is eliminated and the risk of collision is minimised.

The converse applies during the descent. When an aircraft descends through the Transition Level, the pilot sets the local atmospheric pressure (adjusted to sea level) so that the altimeter reads altitude above sea level and ensures that terrain clearance is achieved.

It is accepted that harmonisation of TA and associated procedures brings safety benefit through simplification of airspace and procedures both within and beneath controlled airspace.

TA – Why Change?

As most commercial aircraft tend to fly above 20,000ft for fuel efficiency, there is benefit in moving to a significantly higher TA. This is a complex technical project that will impact on most airports, routes and users. Indeed many issues will have to be considered and resolved with the various user groups before implementation of change will be possible.

In order to minimize the possibilities of aircraft level busts/altitude deviations in Europe, the European Action Plan for the prevention of Level Bust (2004) issued a recommendation to consider establishment of a common European TA.

A common TA applicable across all UK/Irish FAB airspace would:

- Simplify airspace and procedures definition which would reduce the risk of level busts.

- Standardise operating procedures related to altimeter setting.

- Help to prevent vertical infringements by simplifying altimeter setting procedures for General Aviation traffic flying in uncontrolled airspace that sits below controlled airspace.

The foundation of a harmonised higher TA will be an enabler for future changes such as improved Continuous Descent Operations (CDO), Continuous Climb Operations (CCO) and further environmental, service and capacity benefits through more efficient airspace design. It is currently very difficult to design arrival and departure procedures that climb or descend through a TA, without an executive air traffic control instruction, whilst ensuring correct altimeter setting.

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[4] The altitude at which aircraft change from the use of altitude to the use of flight levels based on the international standard pressure setting of 1013 hectopascals.

Raising the TA to 18,000ft (FAS intention) would:

- Alleviate cockpit workload during critical phases of departure/arrival procedures close to the ground – no requirement to adjust altimeter settings at this stage of flight.

- Provide more time to recover from altimeter setting errors before terrain clearance becomes an issue.

- In the Terminal Airspace environment, it would alleviate some of the complexity in routeing and flight planning.

Europe-wide standardisation on one level will amplify all of the above benefits.

TA – Change Timetable

Subject to satisfactory aviation stakeholder consultation and requisite safety assessments, the UK/Ireland FAB has committed to change during winter 2013/14. This is a significant undertaking and involves a considerable amount of work in changing procedures, charts, wording in documentation, training of controllers and educating all airspace users etc, hence the need for a two year lead time. The CAA has set itself this task as a cornerstone that enables the FAS to create one of the major steps towards national airspace redesign.

UK Airspace Design

One of the key requirements that will support the achievement of the FAS Vision is a fundamental redesign of the current UK airspace structure. Any changes resulting from the redesign of airspace, in any area of the UK, will be completed in accordance with the Airspace Change Process set out in CAP 724 and CAP 725. Such activity will need to support strategic goals on safety, environment and capacity, whilst responding to user requirements. A redesign will need to integrate airspace change proposals with new ATC tools and SESAR technologies and airspace systemisation.

Redesign will aim to:

- Provide capacity to meet future demand.

- Eliminate routine airborne holding.

- Reduce the complexity of Terminal operations.

- Introduce Continuous Climb Operations (CCO) and optimise departure performance.

- Introduce Continuous Descent Operations (CDO).

- Deliver enhanced Airspace Management.

To enable these aims we will have to achieve:

- Enhanced Queue Management.

- A revised Transition Altitude.

- Adoption of enhanced navigation principles.

- Increased ATM tool support.

- Sequenced departures.

- A new concept / method of operations.

This work will be complex and consequently the overall Network design will need to be completed first and then implemented through a number of phases during the lifetime of the FAS.

As airspace redesign is progressed and developed, stakeholders will be engaged as appropriate by the change sponsor, both through formal consultation and other engagement and collaboration.

Summary

Following consultation, the FAS was published in June 2011 and aims to enable a modernised air traffic management system that provides safe, efficient airspace, that has the capacity to meet reasonable demand, balances the needs of all users and mitigates the impact of aviation on the environment. The CAA and its partners in the FAS will manage the programme of work and stakeholder engagement through the governance structure for the Strategy. FAS work will be focused through the Oversight Group, the Programme Board and the FAS Industry Implementation Group (FASIIG). Class G airspace issues will be addressed through the FAS NATMAC Sub-group.

Key to delivery of FAS benefits will be the work of the FAS Industry Implementation Group (IIG) which will set out the Industry Implementation Plan to deliver a set of tangible benefits within the 2015-2020 timeframe or earlier where possible. The work will be taken forward through three working groups:

- Regulatory and Government Policy.
- Airspace and Procedures.
- Airports.

The FASIIG Plan needs to be focused on the delivery of improvements to air traffic management in the period to 2020. In effect, the Industry Implementation Plan will represent the UK's approach to meeting the Single European Sky and SESAR requirements. The FASIIG, and its working groups, will look to quantify the benefits in the key areas of:

- Safety.
- Environment.
- Airspace capacity.
- Cost benefits.

To ensure that the needs of all airspace users are accounted for, the FAS NATMAC Sub-Group will enable stakeholder engagement in, and an overview of, the FAS, its development and implementation. The Group will help to ensure that ongoing work is coherent with the Strategy and make sure that stakeholders are kept fully in the picture with progress.

Many of the projects that will support the achievement of the FAS Vision are not under the authority of one organisation. The only way unified progress can be made is through cooperation and collaboration. FASIIG will need to work collaboratively across the aviation community if it is to achieve the desired results. The requirement for cooperation and collaboration goes further than just the FASIIG. Those organisations working in Europe and further afield will need to be aligned and consistent to ensure the FAS and the UK is aligned with European initiatives to deliver the optimum outcome.

The FAS Vision will only be achieved through the delivery of enabling projects such as, but not restricted to, work on:

- Assessing airspace efficiency.
- Class G airspace for the 21st Century.
- Implementation of Performance-based Navigation.
- Harmonisation to a higher Transition Altitude.
- Airspace redesign.

This document was authored by the CAA with support from the Ministry of Defence, NATS and the Department for Transport. If you have any questions or comments you would like to make please contact the CAA at:

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Glossary

AMAN	Arrival Management
ATC	Air Traffic Control
ATM	Air Traffic Management
ATS	Air Traffic Service
BALPA	British Airline Pilots Association
BBAC	British Balloon and Airship Club
BGA	British Gliding Association
BHA	British Helicopter Association
CAA	Civil Aviation Authority
CAP	Civil Aviation Publication
CCO	Continuous Climb Operations
CDM	Collaborative Decision Making
CDO	Continuous Descent Operations
CO_2	Carbon Dioxide
DAP	Director Airspace Policy
DMAN	Departure Management
EADS	European Aeronautic Defence and Space Company
FAA	Federal Aviation Administration (USA)
FAB	Functional Airspace Block
FAS	Future Airspace Strategy
FASIIG	Future Airspace Strategy Industry Implementation Group
FUA	Flexible Use of Airspace
GA	General Aviation
GPS	Global Positioning System
IAA	Irish Aviation Authority
ICAO	International Civil Aviation Organisation
IPCC	Intergovernmental Panel on Climate Change
IR	Instrument Rating
J&I	Joint and Integrated
MoD	Ministry of Defence
NATMAC	National Air Traffic Management Advisory Committee
NATS	National Air Traffic Services
PBN	Performance-based Navigation
PPL	Private Pilots Licence
SES II	Single European Sky Two
SESAR	Single European Sky Air Traffic Management Research Programme
SWIM	System Wide Information Management
TA	Transition Altitude
UAVS	Unmanned Aerial Vehicle Systems