Civil and Military Use of Airspace in France

ONE AIRSPACE MANAGED BY FULLY COORDINATED CIVIL AND MILITARY TRAFFIC CONTROL

France delivers advanced civil and military coordination based on close collaboration and trust to provide efficient joint operations and to manage dense, complex air traffic in a safe manner.

Liberté • Égalité • Fraternité
RÉPUBLIQUE FRANÇAISE
MINISTÈRE DE LA TRANSITION ÉCOLOGIQUE ET SOLIDAIRE

DSNA
Member of FABEC
Member of SESAR

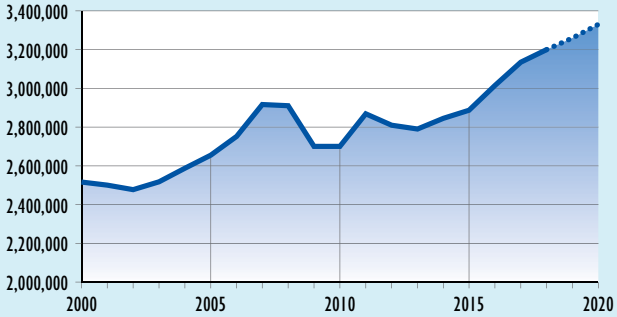
Liberté • Égalité • Fraternité
RÉPUBLIQUE FRANÇAISE
MINISTÈRE DES ARMÉES

DSAÉ
DIRCAM DIRNAV BFEA

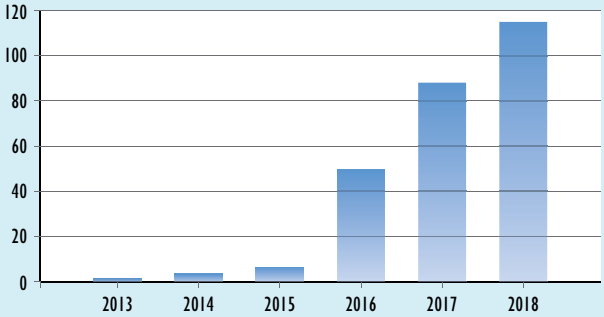
AIR TRAFFIC IN FRENCH AIRSPACE

With 1,000,000 km², the French air navigation services manage one of the largest and busiest airspace in Europe.
Civil air traffic has doubled since 1990: it consists of 50% overflights, 36% international flights (arrivals in France or departures from France) and 14% domestic flights. The peak season from April to October is characterized by increasingly dense traffic: 11,105 flights controlled on July 6, 2018, a European record for one day!

IFR Traffic



Number of days with a traffic > 10,000 flights per day



CIVIL AVIATION

3.1 million
IFR flights

3 million
VFR flights

5
Area Control Centers (ACCs)

72
airports in mainland France and Corsica

3,418
air traffic controllers having a valid license

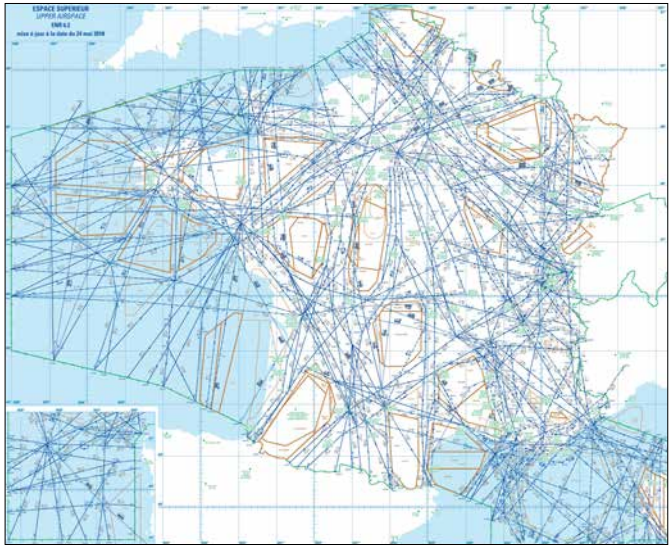
In this airspace, air traffic management is complex: civil and military aircraft fly with disparate performances at the crossroads of the major civil air traffic routes. **In France, civil and military ATC systems are separate but closely coordinated aiming to maintain a high level of safety.**

The latest evolutions of needs leads both Authorities to a more and more advanced cooperation. Thus, **the ministries in charge of Transport (MoT) and Defence (MoD) signed a 2016-2022 joint roadmap** to consolidate the following strategic axes:

- Providing air navigation services fitted to civil airspace users and reducing the environmental footprint of air transport;
- Taking into account new Defence and security policies, in particular air units reorganisation and the evolution of arms systems;
- Managing modernization of civil and military systems for air traffic management (ATM).

Paris-CDG airport: 500,000 IFR movements per year

VFR flight



Brest and Bordeaux ACCs operate ERATO, a stripless ATM system integrating new generation ATC functions

Civil and military Authorities have defined their own route network and permanent and temporary segregated airspace structures: AWY, TMA, CTR; restricted/dangerous/prohibited areas; TSA, CBA (cross-border TSA), network at low altitude.

This map illustrates civil air route network and military training areas in upper airspace. Military airspaces represent 26% of the French airspace design with an average day and night use of 9,000 hours per year. If taking account the flexible use of these airspaces, military airspaces only represent around 2% of the global French airspace.

There are 171,000 State Aviation flights per year in France, of which 600 are RPAS flights. 80% flights are conducted in military air traffic (OAT) and 20% in general air traffic (GAT).

The RAFALE fighter

The Airbus 400M carrier

Military Aviation

69,000
Movements per year
in upper airspace

3 Military Control Centers (CDC)
5 Military coordination
and control cells (CMCC) within
civil en-route control centers (ACCs)
2 Navy Control Centers

16 Air Force airfields
5 Navy airfields
5 Army airfields

1,340
Air trafic controllers having a valid license,
of which 800 are working
in airports local control centers

HOW DOES FRANCE MANAGE ITS AIRSPACE TO INTEGRATE INTO BUSY CIVIL AIR TRAFFIC

1 THE **STRATEGIC** PHASE

In France, decisions are taken by two bodies:

> The High Level Airspace Policy Board

Co-presided on behalf of the Ministry of Transportation by DTA, the civil aviation Authority for regulation, embedded inside DGAC and on behalf of the Ministry of Defence by DIRCAM, the military ATM Directorate, embedded inside DSAé, this body validates the French airspace organisation by defining permanent airspace structures and their rules of management. Publication agreements are sent to the civil and military services for aeronautical information colocated in Bordeaux.

It is supported by 4 regional structures in charge of studying modifications or new airspace design. Twice a year, general aviation users are consulted to know their needs and to inform them about changes.

> The Permanent Group of Airspace Directorate for the safety of ATM

Co-presided by DSAC, the national supervisory Authority and DIRCAM, this group validates Airspace Management (ASM) operational solutions. DSNA, the civil air navigation service provider, also takes parts in this group.

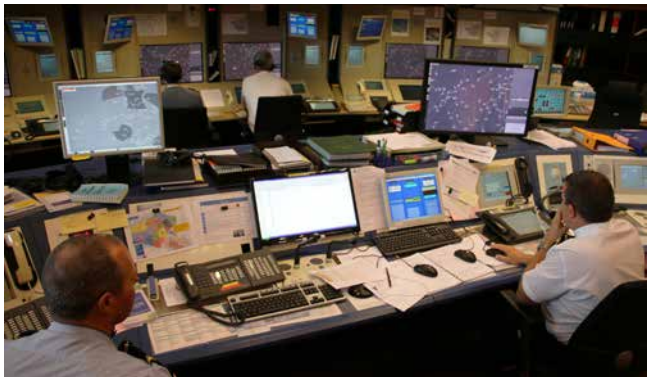
2 THE **PRE-TACTICAL** PHASE (D-5 TO D-1)

> The civil & military Airspace Management Cell (AMC)

To optimise airspace capacity every day, this cell called AMC France located in the Paris area uses its own appropriate support systems. It gives the priorities to civil or military needs from rules established at the strategic level, allowing conditional routes (CDR) and direct routes (DCT) planification to civil airspace users in accordance with military activity.

Most of military airspaces are activated less than 4 hours per day. When a military area is scheduled to be inactive, airlines can plan direct routes. The rate between "Scheduled Use at D-1" and "Achieved Use" is about 90%.

3 THE **TACTICAL** PHASE



CMCC colocated in the operations room at Brest ACC.

INTENSE MILITARY OPERATIONS CONTROL OPERATIONS?

An advanced airspace design in the South-West of France: providing even further fluidity for civil overflights and meeting the new military needs.

As of 1st March 2018, a new upper airspace network has been implemented in the southern part of the airspace managed by Bordeaux ACC, enhancing capacity and flight efficiency while maintaining a high level of safety. It also favours direct routes for civil aviation.
For that, two military zones at high altitudes (Temporary Segregated Areas) were reconfigurated and one zone was remodeled to include a core area and modular extensions allowing volumes to be adjusted closely to requirements of military missions due to new generation arms equipment. By applying the concept of Flexible Use of Airspace (FUA) management, airlines are now able to plan direct routes ahead whenever a part of this TSA is scheduled to be inactive. To accompany this change, sectorisation of Bordeaux ACC had to be modified.

Civil air traffic controllers at Bordeaux ACC.

France hosts major European military coordination exercises

In 2017, a new airspace design in the Greater West of France was redefined, a civil & military project ongoing for about 10 years. With this reorganisation, the National Navy and Air Force have been allowed to host the NATO 'Tiger' Association (North Atlantic Treaty Organization) in June 2017, a major training exercise for coordination and interoperability between armies that has mobilised 2,400 people from 12 nations and 70 aircraft & helicopters for 11 days!
During this period, the civil air traffic flows in this area were very heavy. **Thanks to Advanced-FUA and ATFCM measures, delays on civil traffic were minimised.**

The tactical planning until H-3 is under the responsibility of the AMC.

> Military coordination and control cells (CMCC) colocated in civil en-route control centers (ACCs)

To guarantee effective, real-time, civil & military coordination for traffic outside TSA, DSNA and the French Air Force have embedded specialized CMCC colocated in each ACC. With this evolution of the former military coordination detachment (DMC), France meets the requirements of the Single European Sky in matters of direct communication between civil and military controllers, and increases flight safety.

The CMCC role is to control all the military en-route flights and progressively to integrate even more the control of certain Defence activities within the ACCs area of responsibility.

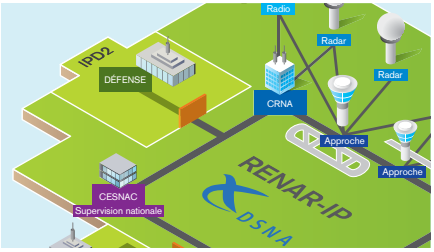
> Civil cells (DCC) colocated in military control centers

This cell informs the civil controller about activation/desactivation of military areas, negociates transit through active military areas after H-3 and may help him in tactical coordination.

OTHER MAJOR CIVIL AND MILITARY COOPERATION ACTIVITIES

NATIONAL PROJECTS

> Interoperability between the future technical civil and military systems



DSNA is the first major European operator to use operational vocal communications through Internet Protocol (IP). Its latest generation RENAR-IP network allows supporting new services, always more demanding in terms of performance and reliability. Connected to the European IP network, it is also interconnected with the IP network of Defence (IPD2): the correct functioning of these networks is a prerequisite to putting 4-FLIGHT into service.

4-FLIGHT will be the future standardised ATM system for en-route in both civilian and military embedded centers (ACCs and CMCCs). To tackle this technical major issue, a joint DSNA/Defence group work together on the interoperability of existing systems necessary to the transition phase up to service start-up of 4-FLIGHT in the 5 ACCs, and on the adaptations of 4-FLIGHT to be carried out by the CMCCs.

> RPAS within civil air traffic: defining regulations for Unmanned aircraft system Traffic management (UTM)

DSNA and Defence are very much involved in the integration of medium altitude long endurance drones (MALE) in civil air traffic other than in segregated airspace. This new generation unmanned aircraft system will become, in the short term, a real operational challenge for overall performance of air traffic management.

In the context of SESAR project on new separation modes, DSNA and Defence have performed first test flights with a military HARFANG drone to assess the accomodation of drone with civil IFR traffic including coordination, transfers and abnormal modes.

Then, both Authorities led live trials with the new military REAPER drone in the upper airspace of Bordeaux ACC in July 2018. This drone has performances equivalent to those of regional aircraft. The results obtained will be shared with the EASA, the European Agency for Safety Aviation, in charge of setting up the future regulations in this matter.

Moreover, DSNA is involved in two others RPAS SESAR projects:

> CORUS (Concept of Operations for European Unmanned Systems): definition of operational concepts flight rules applicable to drones in non-controlled airspaces, mainly below 500 feet (150 meters).

> PODIUM (Proving Operations of Drones with initial UTM Management): demonstration and validation of these concepts with experiments in the Paris and Toulouse areas.

The new military REAPER drone.

24th July 2018: crossroad between the flight KLM and the drone VIRUS at FL 190 (UIR Bordeaux)

> Enhanced cooperation in the area of AIM

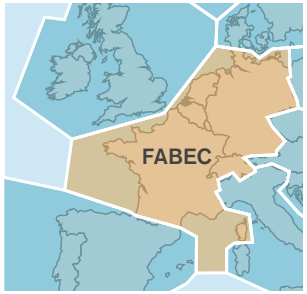
DSNA and DIRCAM have signed a cooperation agreement to reinforce their synergies in the area of AIM (Aeronautical Information Management). Thus, military and civil experts participate actively in the SOFIA project launched by DSNA, an umbrella project for modernising aeronautical information data chain and processes in order to provide added-value services. These new tools and services offer in real-time, fine-tuned services as interactive and dynamic graphics, fitted to airspace users.

PROMOTING A BETTER INTEGRATION OF CIVIL AND MILITARY PROCESSES AT THE EUROPEAN LEVEL

FABEC

The airspace of the six FABEC States of Belgium, France, Germany, Luxembourg, the Netherlands and Switzerland is one of the busiest and most complex in Europe. The majority of major European airports, major civil airways and military training areas are located in this core area. A performance plan has been established at FABEC level, including a military dimension, so that airline companies operate more economical and less polluting flights.

> Management of airspace capacity and flow regulation

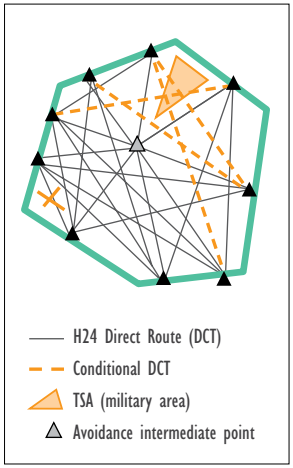


At FABEC level, a joint Flexible Use of Airspace Task Force has been created:

- to harmonize ASM CDM processes and to deploy ATFCM/ASM processes, including the interface with the Network Manager (EUROCONTROL), to deal with the increase in civil traffic, its unpredictability as well as with military needs
- to enhance cooperation between FABEC AMCs
- to develop a specific tool (FASO: FABEC Airspace Status Overview) to exchange real-time data between civil and military cells/control units
- to optimize FUA at the level 3
- to improve training for civil and military staff responsible for ASM.

> Free Route Airspace (FRA)

The objective aims at setting up a FABEC FRA at FL305 and lower when and where possible in a stepped approach: night network, weekend routes, free route during military activities until the utimate goal with the introduction of the business trajectories. This new approach is possible thanks to Advanced-FUA: dynamic planning and decisions processes are very close to operational time. The project also supports the direct routing. Horizontal flight efficiency improvement of most-penalized city pairs is being studied.



PARTNER OF SESAR JOINT UNDERTAKING

Europe's armed forces operate more than 150,000 flights per year. Civil and military parties are working together in the SESAR Research and Innovation programme of the Single European Sky, in particular to promote a better integration of their processes in terms of flight plan, civil-military information exchange via SWIM and trajectory information interoperability through IOP/Flight Object concept.

Publisher: Maurice GEORGES – Edition: DSNA – Layout: All-write – Pictures: Richard NICOLAS-NELSON/Armée de l'air/Armées, D. PUJO/Armée de l'air/Défense, DSNA, S. Cambon – Printing: DSNA/SIA – March 2019