



The 15th International Scientific Conference
**“DEFENSE RESOURCES MANAGEMENT
IN THE 21st CENTURY”**
Braşov, November 12th-13th 2020



ANALYSIS OF THE AIRSPACE MANAGEMENT

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Abstract:

This project follows the analysis of airspace management from the perspective of the 2 major flight authorities EASA and FAA. The following pages will make it possible to get acquainted with the two authorities as well as with ICAO (INTERNATIONAL CIVIL AVIATION ORGANIZATION), an organization under the jurisdiction of which most aircraft in the world fly. It will be defined certain concepts that delimit the airspace in areas in order to make possible the management of the airspace as efficient and effective as possible. Also it will be presented certain areas of airspace reserved for different types of special activities (such as military). All these concepts are analyzed to understand the need for airspace management to operate it at a maximum level and in complete safety.

Key words: airspace; authority; area; organization; aircraft;

1. Introduction

The biggest subdivision of the airspace in the world is the Flight Information Region (FIR). Those FIRs usually coincide with the national borders of the countries, but in some cases for larger countries the airspace is subdivided into a number of regional FIRs and in opposite in case of small countries some FIRs have in composition, territorial airspace of several countries. This subdivision among authorities is done by international agreement through the International Civil Aviation Organization (ICAO) founded in 1945, those FIRs have existed at least since 1947. On the territory of FIR, the Flight Information Service (FIS) and the Alerting Service are provided. Considering the vertical boundaries, FIR start from the ground to Flight Level (FL) 195 and there is also an additional region named Upper Information Region (UIR) which extend from FL195 and up without any boundaries from that.

The Flight Information Service (FIS) zone is the next level of subdivision of the airspace. FIR can be separated in smaller FIS zones having different frequencies of the radio. In those zones, FIS and Alerting Service are also provided. These services are available to any aircraft and can inform the pilots about potentially conflicting traffic, the meteorological information, information about aerodromes, information about possible hazards to flight but the FIS does not provide the positive separation from the traffic.

2. Airspace Classes

There are 3 kinds of airspace classes:

- The controlled airspace from A to E;



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- Advisory airspace F;
- Uncontrolled airspace G;

Controlled airspace has classes from A to E, they are classified as controlled airspace within which the air traffic control (ATC) is provided. The controlled airspace is designated to provide separation service for enroute controlled traffic and ATC clearance is required for all traffic in the controlled airspace.

Advisory airspace is a class of the airspace between controlled and uncontrolled airspace. It is in fact as advisory in which the ATC services are provided only to instrumental flight rules (IFR) traffic. It is needed to file a flight plan only for IFR flights and ATC clearance is not required. Actually, the class F is not commonly used, at least there is no class F in Europe neither in United States.

Uncontrolled airspace is the most common and mostly used for visual flight rules (VFR) flights because is the basic airspace where aircrafts can fly without any clearance and without filing the flight plan. Only the flight information services are provided for all the traffic in the uncontrolled airspace and the ATC clearance is not required.

Airspace vertical boundaries, considering the airspace classes are different between Federal Aviation Administration (FAA) in United States and European Aviation Safety Agency in European Union. These differences and the boundaries are presented in the following table:

Class		FAA	EASA
A	controlled	from 18,000 feet MSL up to and including FL 600. Upper airspace. IFR only	not used
B		from the surface to 10,000 feet MSL surrounding the nation's busiest airports	not used
C		from the surface to 4,000 feet above the airport elevation (MSL) surrounding airports that have an operational control tower and are serviced by a radar approach control	1. above LF95 to FL660 2. within TMA of busiest airports from upper level of D airspace
D		from the surface to 2,500 above the airport elevation (charted in MSL) airports with an operational control tower	From surface up to FL95 (depends on CTR and TMA configurations)
E		other controlled airspace	from 1000 AGL to FL95
F	Advisory	not used	not used
G	uncontrolled	from surface to 1200 AGL (14 500 MSL max in some areas)	from surface to 1000 AGL (2500 AGL in mountain area)

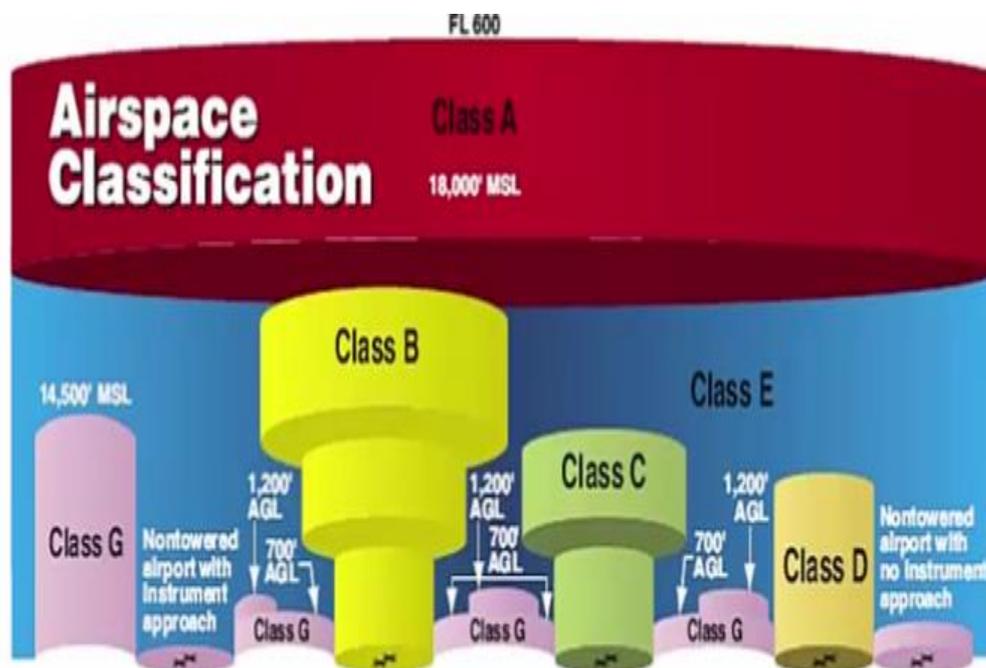
The major differences between those authorities are that for EASA there are no classes A and B used and for class C there is a little bit different designation of this class between those authorities.

a. FAA airspace classification

The graphical interpretation of the classification of the airspace by FAA is the following:



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Class A is an upper airspace designated only for IFR traffic and it extends from 18.000 ft mean sea level (MSL) to FL600.

Class B is the controlled airspace surrounding the national busiest airports and it extends from 0 ft above ground level (AGL) to 10.000 ft MSL.

Class C is the controlled airspace surrounding airports that have operational control tower and services by a radar approach control. It extends from 0 ft AGL to 4.000 MSL.

Class D is designated for airports with an operational control tower only and it extends from 0 ft AGL to 2500ft MSL.

Class E is other non-classified controlled airspace and it extends from 0 ft AGL to 18.000 ft MSL.

Class F is the advisory airspace and is not used in United States.

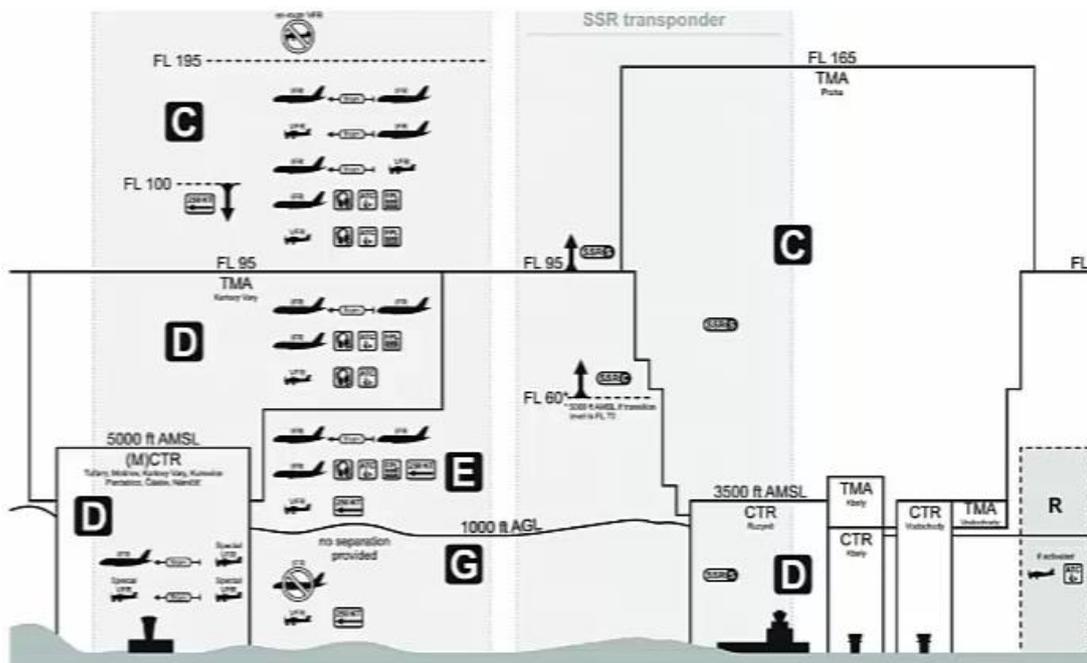
Class G is uncontrolled airspace where usually the upper boundary is only 1200 ft AGL, but it extends from 0 ft AGL to 14.500 ft MSL.

b. EASA airspace classification

EASA classification is a little bit simpler because the European authority is trying to simplify rules and it uses less classes of the airspace. The EASA airspace classification can be represented by the following graph:



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Class A and B are not used.

Class C is used only for common control traffic above FL 95 or this class is also designated for busiest airport from the upper level D airspace. In this class VFR flights are prohibited starting from level 195.

Class D is designated for control zones and terminal maneuvering areas for other airports. It starts from the ground and extends to FL 95.

Class E is just other common controlled airspace and it starts from 1.000 AGL and extends to FL 95.

Class F is the advisory airspace and is not used in the European Union.

Class G is the uncontrolled airspace starting from the ground and extends to 1.000 ft. AGL or 2.500 AGL in mountain area.

c. Types Of Controlled Airspace

The Control Area (CTA) is the controlled airspace which extends from a specific limit above the earth to a specific upper limit. This is the airspace designated to provide service for enroute controlled flights. In order to enter this control area, it is always needed to get ATC clearance.

The Control zone (CTR) is the part of the airspace which extends upward from the surface of the Earth to a specific upper limit. This airspace is designated to provide ATC to arriving and departing controlled traffic in busy airports. The upper limit of this airspace can be restricted by an altitude or a flight level but also the inferior limit of the CTA. ATC clearance is required to enter the CTR.



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Terminal maneuvering area (TMA) is a controlled airspace designated for providing the approach control service. It is usually larger than CTR and also the ATC clearance is required to enter this zone.

d. Restricted Areas

There are some set of the restricted areas like: restricted , prohibited, temporary reserved, military zones, danger areas, restricted and segregated areas. The restrictions of these area can be permanent or temporarily active. The boundaries and the designator code of those zones can be found on the aeronautical charts. If these restricted areas are temporarily active is better to check the latest NOTAM notice to check the activity and status of them. FIS can also give actual information about the restricted areas on the route.

Prohibited areas are designated to establish security areas for reason associated to the national welfare. Entering those areas may result in interception of the aircraft and a possibility of the attack upon the violating aircraft. On the aeronautical charts, prohibited areas are symbolized with “P” and the country designation code.

Restricted areas are designated for any aircraft related to the activities considered to be hazardous for aircraft such as an artillery firing. These areas are usually restricted for military reasons. Their boundaries and designation codes can be found in aeronautical charts and traffic has to check NOTAM and FIS to determine the time of usage of those restricted areas.

Danger areas are very similar to the restricted areas which includes military exercises involving: firing, parachute dropping, unpredictable aircraft maneuvers, military aircraft maneuvers or using the unmanned aerial systems. Information about those areas can be found in NOTAM, aeronautical charts and contacting FIS.

Temporary reserved areas has a defined dimension, where some special aerial operations take place and the other traffic is not allowed without the appropriate ATC clearance. Those areas are not fully restricted and in some cases aircraft can transit this area with getting appropriate ATC clearance.

Temporary restricted areas cannot be found on the aeronautical charts or Aeronautical Information Publication (AIP) but it can be found information about the activity and dimension of those zones in NOTAMS or supplementary of the AIP (AIP SUP).

Temporary segregated areas are zones of the airspace designated for military aerial operations, basic or advanced flight instruction, tactic instruction, aeronautical sport, testing and homologation of aircraft as well as some activities established by specific regulations. When those areas are activated, normal traffic is not allowed to transit them.

Military zones are designated for exclusive military use. The aircraft can transit those zones if there is no military activity at that time, the aircraft contacted the ATC 15 nautical miles from the border or 5 minutes before the aircraft enters the zone and it gets the appropriate ATC clearance.

e. Advisory Areas

Local airport advisory refers to small airports which do not have a control tower. Instead of control tower they have flight service station available. The participants of the traffic can ask



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the required information about the traffic, wind or operating runways. The aircraft also have to give intentions to enter the area but they do not need to get the clearance.

Remote airport advisory refers to airports with no control tower or flight service station. The aircraft can use the radio frequency to communicate between them. Those zones have usually, in Europe a radius of 2.5 nautical miles around the airport and in United States up to 10 nautical miles.

4. Conclusion

Flight information regions are the biggest parts of the airspace and they usually coincide with the national borders. In those regions Flight information service and Alerting service are provided.

Flight information region can be subdivided in smaller zones called flight information service zones.

Classes A to E are classes of the controlled airspace where air traffic control is provided. Air traffic control clearance is required in those controlled classes.

Class F is an advisory airspace where advisory ATC is provided to IFR flights, it is needed to file a flight plan and ATC clearance is not required.

Class G is an uncontrolled airspace where only FIS is provided for all traffic and ATC clearance is not required.

Airspace vertical boundaries differs from one authority to another. There are 2 big authorities in the world: EASA in Europe and FAA in United States.

Services, requirements and speed limitations differs considering the airspace classes and also between the kind of flight, VFR or IFR.

Flight restricted areas are flight zones where the flight is permanently or temporary forbidden or it is needed to contact and to get the appropriate clearance from the ATC to transit the zone.

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