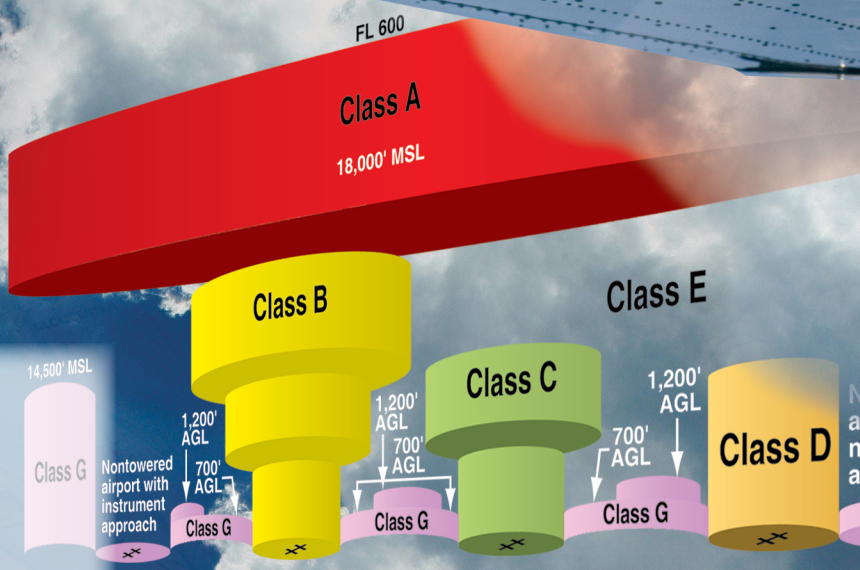
Chapter 15

Airspace

Introduction

The two categories of airspace are: regulatory and nonregulatory. Within these two categories, there are four types: controlled, uncontrolled, special use, and other airspace. The categories and types of airspace are dictated by the complexity or density of aircraft movements, nature of the operations conducted within the airspace, the level of safety required, and national and public interest. *Figure 15-1* presents a profile view of the dimensions of various classes of airspace. Also, there are excerpts from sectional charts that are discussed in Chapter 16, Navigation, that are used to illustrate how airspace is depicted.



Basic VFR Weather Minimums

Airspace			Flight Visibility	Distance from Clouds
Class A			Not applicable	Not applicable
Class B			3 statute miles	Clear of clouds
Class C			3 statute miles	1,000 feet above 500 feet below 2,000 feet horizontal
Class D			3 statute miles	1,000 feet above 500 feet below 2,000 feet horizontal
Class E	At or above 10,000 feet MSL		5 statute miles	1,000 feet above 1,000 feet below 1 statute mile horizontal
	Less than 10,000 feet MSL		3 statute miles	1,000 feet above 500 feet below 2,000 feet horizontal
Class G	1,200 feet or less above the surface (regardless of MSL altitude).	Day, except as provided in section 91.155(b)	1 statute mile	Clear of clouds
		Night, except as provided in section 91.155(b)	3 statute miles	1,000 feet above 500 feet below 2,000 feet horizontal
	More than 1,200 feet above the surface but less than 10,000 feet MSL.	Day	1 statute mile	1,000 feet above 500 feet below 2,000 feet horizontal
		Night	3 statute miles	1,000 feet above 500 feet below 2,000 feet horizontal
	More than 1,200 feet above the surface and at or above 10,000 feet MSL.		5 statute miles	1,000 feet above 1,000 feet below 1 statute mile horizontal

Class Airspace	Entry Requirements	Equipment	Minimum Pilot Cert
Class A	ATC clearance	IFR equipped	Instrument rating
Class B	ATC clearance	Two-way radio, transponder with altitude reporting capability	Private—(However, recreational pilot m other than the pri seeking private r if regulatory re
Class C	Two-way radio communications prior to entry	Two-way radio, transponder with altitude reporting capability	No specific
Class D	Two-way radio communications prior to entry	Two-way radio	No spec
Class E	None for VFR	No specific requirement	No
Class G	None	No specific requirement	N

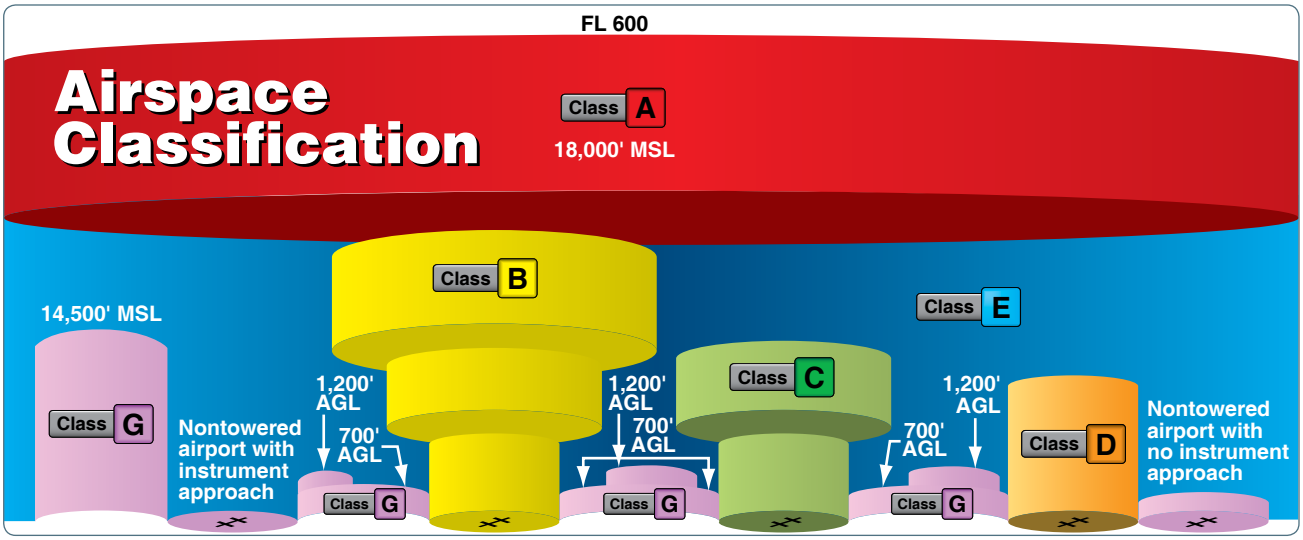


Figure 15-1. *Airspace profile.*

Controlled Airspace

Controlled airspace is a generic term that covers the different classifications of airspace and defined dimensions within which air traffic control (ATC) service is provided in accordance with the airspace classification. Controlled airspace consists of:

- Class A
- Class B
- Class C
- Class D
- Class E

Class A Airspace

Class A airspace is generally the airspace from 18,000 feet mean sea level (MSL) up to and including flight level (FL) 600, including the airspace overlying the waters within 12 nautical miles (NM) of the coast of the 48 contiguous states and Alaska. Unless otherwise authorized, all operation in Class A airspace is conducted under instrument flight rules (IFR).

Class B Airspace

Class B airspace is generally airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports in terms of airport operations or passenger enplanements. The configuration of each Class B airspace area is individually tailored, consists of a surface area and two or more layers (some Class B airspace areas resemble upside-down wedding cakes), and is designed to contain all published instrument procedures once an aircraft enters the airspace. ATC clearance is required for all aircraft to operate in the area, and all aircraft that are so cleared receive separation services within the airspace.

Class C Airspace

Class C airspace is generally airspace from the surface to 4,000 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower, are serviced by a radar approach control, and have a certain number of IFR operations or passenger enplanements. Although the configuration of each Class C area is individually tailored, the airspace usually consists of a surface area with a five NM radius, an outer circle with a ten NM radius that extends from 1,200 feet to 4,000 feet above the airport elevation. Each aircraft must establish two-way radio communications with the ATC facility providing air traffic services prior to entering the airspace and thereafter must maintain those communications while within the airspace.

Class D Airspace

Class D airspace is generally airspace from the surface to 2,500 feet above the airport elevation (charted in MSL) surrounding those airports that have an operational control tower. The configuration of each Class D airspace area is individually tailored and, when instrument procedures are published, the airspace is normally designed to contain the procedures. Arrival extensions for instrument approach procedures (IAPs) may be Class D or Class E airspace. Unless otherwise authorized, each aircraft must establish two-way radio communications with the ATC facility providing air traffic services prior to entering the airspace and thereafter maintain those communications while in the airspace.

Class E Airspace

Class E airspace is the controlled airspace not classified as Class A, B, C, or D airspace. A large amount of the airspace over the United States is designated as Class E airspace.

This provides sufficient airspace for the safe control and separation of aircraft during IFR operations. Chapter 3 of the Aeronautical Information Manual (AIM) explains the various types of Class E airspace.

Sectional and other charts depict all locations of Class E airspace with bases below 14,500 feet MSL. In areas where charts do not depict a class E base, class E begins at 14,500 feet MSL.

In most areas, the Class E airspace base is 1,200 feet AGL. In many other areas, the Class E airspace base is either the surface or 700 feet AGL. Some Class E airspace begins at an MSL altitude depicted on the charts, instead of an AGL altitude.

Class E airspace typically extends up to, but not including, 18,000 feet MSL (the lower limit of Class A airspace). All airspace above FL 600 is Class E airspace.

Uncontrolled Airspace

Class G Airspace

Uncontrolled airspace or Class G airspace is the portion of the airspace that has not been designated as Class A, B, C, D, or E. It is therefore designated uncontrolled airspace. Class G airspace extends from the surface to the base of the overlying Class E airspace. Although ATC has no authority or responsibility to control air traffic, pilots should remember there are visual flight rules (VFR) minimums that apply to Class G airspace.

Special Use Airspace

Special use airspace or special area of operation (SAO) is the designation for airspace in which certain activities must be confined, or where limitations may be imposed on aircraft operations that are not part of those activities. Certain special use airspace areas can create limitations on the mixed use of airspace. The special use airspace depicted on instrument charts includes the area name or number, effective altitude, time and weather conditions of operation, the controlling agency, and the chart panel location. On National Aeronautical Charting Group (NACG) en route charts, this information is available on one of the end panels. Special use airspace usually consists of:

- Prohibited areas
- Restricted areas
- Warning areas
- Military operation areas (MOAs)
- Alert areas
- Controlled firing areas (CFAs)

Prohibited Areas

Prohibited areas contain airspace of defined dimensions within which the flight of aircraft is prohibited. Such areas are established for security or other reasons associated with the national welfare. These areas are published in the Federal Register and are depicted on aeronautical charts. The area is charted as a "P" followed by a number (e.g., P-40). Examples of prohibited areas include Camp David and the National Mall in Washington, D.C., where the White House and the Congressional buildings are located. *[Figure 15-2]*

Restricted Areas

Restricted areas are areas where operations are hazardous to nonparticipating aircraft and contain airspace within which the flight of aircraft, while not wholly prohibited, is subject to restrictions. Activities within these areas must be confined because of their nature, or limitations may be imposed upon aircraft operations that are not a part of those activities, or both. Restricted areas denote the existence of unusual, often invisible, hazards to aircraft (e.g., artillery firing, aerial gunnery, or guided missiles). IFR flights may be authorized to transit the airspace and are routed accordingly. Penetration of restricted areas without authorization from the using or controlling agency may be extremely hazardous to the aircraft and its occupants. ATC facilities apply the following procedures when aircraft are operating on an IFR clearance (including those cleared by ATC to maintain VFR on top) via a route that lies within joint-use restricted airspace:

1. If the restricted area is not active and has been released to the Federal Aviation Administration (FAA), the ATC facility allows the aircraft to operate in the restricted airspace without issuing specific clearance for it to do so.
2. If the restricted area is active and has not been released to the FAA, the ATC facility issues a clearance that ensures the aircraft avoids the restricted airspace.

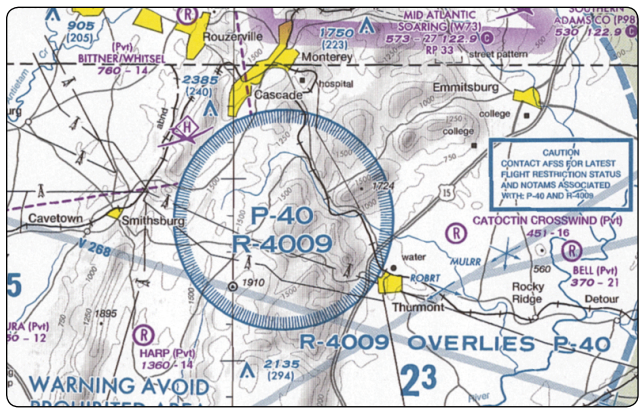


Figure 15-2. *An example of a prohibited area, P-40 around Camp David.*

Restricted areas are charted with an "R" followed by a number (e.g., R-4401) and are depicted on the en route chart appropriate for use at the altitude or FL being flown. *[Figure 15-3]* Restricted area information can be obtained on the back of the chart.

Warning Areas

Warning areas are similar in nature to restricted areas; however, the United States government does not have sole jurisdiction over the airspace. A warning area is airspace of defined dimensions, extending from 3 NM outward from the coast of the United States, containing activity that may be hazardous to nonparticipating aircraft. The purpose of such areas is to warn nonparticipating pilots of the potential danger. A warning area may be located over domestic or international waters or both. The airspace is designated with a "W" followed by a number (e.g., W-237). *[Figure 15-4]*

Military Operation Areas (MOAs)

MOAs consist of airspace with defined vertical and lateral limits established for the purpose of separating certain military training activities from IFR traffic. Whenever an MOA is being used, nonparticipating IFR traffic may be cleared through an MOA if IFR separation can be provided by ATC. Otherwise, ATC reroutes or restricts nonparticipating IFR traffic. MOAs are depicted on sectional, VFR terminal area, and en route low altitude charts and are not numbered (e.g., "Camden Ridge MOA"). *[Figure 15-5]* However, the MOA is also further defined on the back of the sectional charts with times of operation, altitudes affected, and the controlling agency.

Alert Areas

Alert areas are depicted on aeronautical charts with an "A" followed by a number (e.g., A-211) to inform nonparticipating pilots of areas that may contain a high volume of pilot training or an unusual type of aerial activity. Pilots should exercise caution in alert areas. All activity within an alert area shall be conducted in accordance with regulations, without waiver, and pilots of participating aircraft, as well as pilots transiting the area, shall be equally responsible for collision avoidance. *[Figure 15-6]*

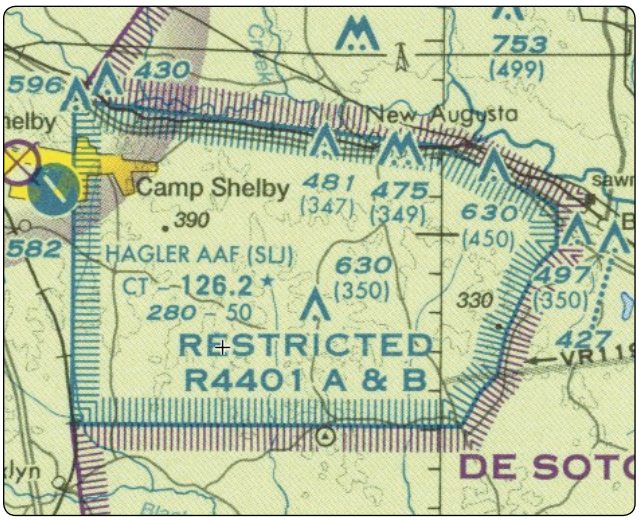


Figure 15-3. *Restricted areas on a sectional chart.*

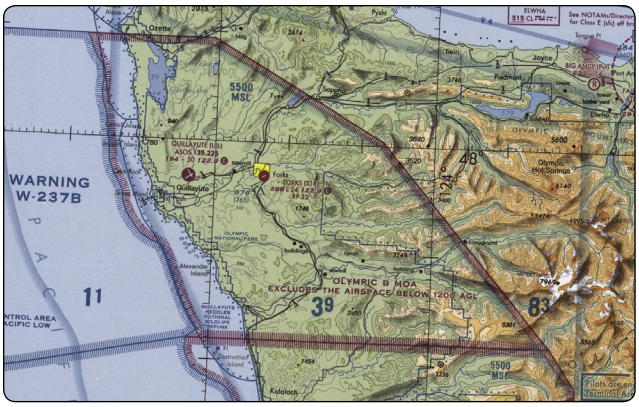


Figure 15-4. *Requirements for airspace operations.*

Controlled Firing Areas (CFAs)

CFAs contain activities that, if not conducted in a controlled environment, could be hazardous to nonparticipating aircraft. The difference between CFAs and other special use airspace is that activities must be suspended when a spotter aircraft, radar, or ground lookout position indicates an aircraft might be approaching the area. There is no need to chart CFAs since they do not cause a nonparticipating aircraft to change its flight path.

Other Airspace Areas

"Other airspace areas" is a general term referring to the majority of the remaining airspace. It includes:

- Local airport advisory (LAA)
- Military training route (MTR)
- Temporary flight restriction (TFR)
- Parachute jump aircraft operations
- Published VFR routes
- Terminal radar service area (TRSA)
- National security area (NSA)
- Air Defense Identification Zones (ADIZ) land and water based and need for Defense VFR (DVFR) flight plan to operate VFR in this airspace
- Intercept Procedures and use of 121.5 for communication if not on ATC already

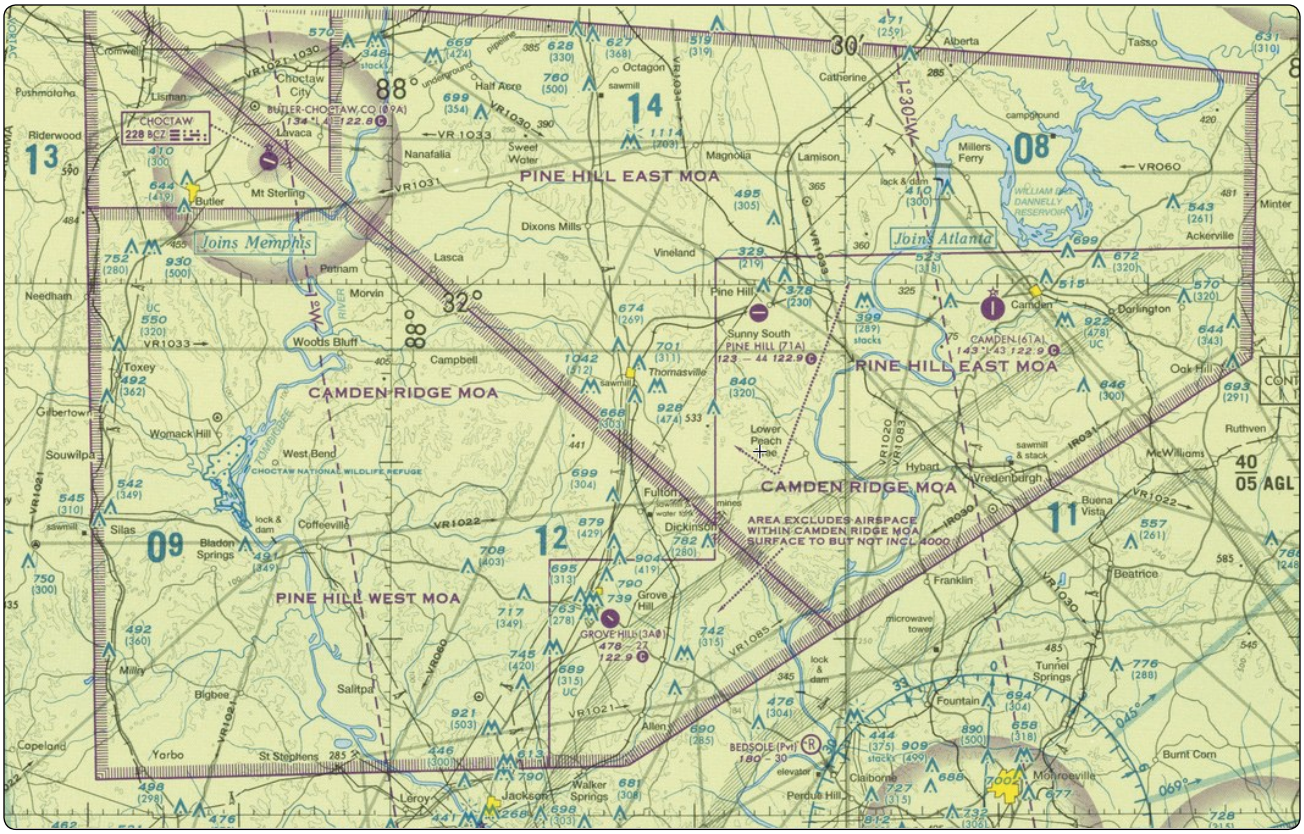


Figure 15-5. *Camden Ridge MOA is an example of a military operations area.*

Figure 15-6. *Alert area (A-211).*

- Flight Restricted Zones (FRZ) in vicinity of Capitol and White House
- Special Awareness Training required by 14 CFR 91.161 for pilots to operate VFR within 60 NM of the Washington, DC VOR/DME
- Wildlife Areas/Wilderness Areas/National Parks and request to operate above 2,000 AGL
- National Oceanic and Atmospheric Administration (NOAA) Marine Areas off the coast with requirement to operate above 2,000 AGL
- Tethered Balloons for observation and weather recordings that extend on cables up to 60,000

Local Airport Advisory (LAA)

An advisory service provided by Flight Service Station (FSS) facilities, which are located on the landing airport, using a discrete ground-to-air frequency or the tower frequency when the tower is closed. LAA services include local airport advisories, automated weather reporting with voice broadcasting, and a continuous Automated Surface Observing System (ASOS)/Automated Weather Observing Station (AWOS) data display, other continuous direct reading instruments, or manual observations available to the specialist.

Military Training Routes (MTRs)

MTRs are routes used by military aircraft to maintain proficiency in tactical flying. These routes are usually established below 10,000 feet MSL for operations at speeds in excess of 250 knots. Some route segments may be defined at higher altitudes for purposes of route continuity. Routes are identified as IFR (IR), and VFR (VR), followed by a number. *[Figure 15-7]* MTRs with no segment above 1,500 feet AGL are identified by four number characters (e.g., IR1206, VR1207). MTRs that include one or more segments above 1,500 feet AGL are identified by three number characters (e.g., IR206, VR207). IFR low altitude en route charts depict all IR routes and all VR routes that accommodate operations above 1,500 feet AGL. IR routes are conducted in accordance with IFR regardless of weather conditions. VFR sectional charts depict military training activities, such as IR, VR, MOA, restricted area, warning area, and alert area information.

Figure 15-7. *Military training route (MTR) chart symbols.*

Temporary Flight Restrictions (TFR)

A flight data center (FDC) Notice to Airmen (NOTAM) is issued to designate a TFR. The NOTAM begins with the phrase "FLIGHT RESTRICTIONS" followed by the location of the temporary restriction, effective time period, area defined in statute miles, and altitudes affected. The NOTAM also contains the FAA coordination facility and telephone number, the reason for the restriction, and any other information deemed appropriate. The pilot should check the NOTAMs as part of flight planning.

Some of the purposes for establishing a TFR are:

- Protect persons and property in the air or on the surface from an existing or imminent hazard.
- Provide a safe environment for the operation of disaster relief aircraft.
- Prevent an unsafe congestion of sightseeing aircraft above an incident or event, that may generate a high degree of public interest.
- Protect declared national disasters for humanitarian reasons in the State of Hawaii.
- Protect the President, Vice President, or other public figures.
- Provide a safe environment for space agency operations.

Since the events of September 11, 2001, the use of TFRs has become much more common. There have been a number of incidents of aircraft incursions into TFRs that have resulted in pilots undergoing security investigations and certificate suspensions. It is a pilot's responsibility to be aware of TFRs in their proposed area of flight. One way to check is to visit the FAA website, www.tfr.faa.gov, and verify that there is not a TFR in the area.

Parachute Jump Aircraft Operations

Parachute jump aircraft operations are published in the Chart Supplement U.S. (formerly Airport/Facility Directory). Sites that are used frequently are depicted on sectional charts.

Published VFR Routes

Published VFR routes are for transitioning around, under, or through some complex airspace. Terms such as VFR flyway, VFR corridor, Class B airspace VFR transition route, and terminal area VFR route have been applied to such routes.

These routes are generally found on VFR terminal area planning charts.

Terminal Radar Service Areas (TRSAs)

TRSAs are areas where participating pilots can receive additional radar services. The purpose of the service is to provide separation between all IFR operations and participating VFR aircraft.

The primary airport(s) within the TRSA become(s) Class D airspace. The remaining portion of the TRSA overlies other controlled airspace, which is normally Class E airspace beginning at 700 or 1,200 feet and established to transition to/from the en route/terminal environment. TRSAs are depicted on VFR sectional charts and terminal area charts with a solid black line and altitudes for each segment. The Class D portion is charted with a blue segmented line. Participation in TRSA services is voluntary; however, pilots operating under VFR are encouraged to contact the radar approach control and take advantage of TRSA service.

National Security Areas (NSAs)

NSAs consist of airspace of defined vertical and lateral dimensions established at locations where there is a requirement for increased security and safety of ground facilities. Flight in NSAs may be temporarily prohibited by regulation under the provisions of Title 14 of the Code of Federal Regulations (14 CFR) part 99, and prohibitions are disseminated via NOTAM. Pilots are requested to voluntarily avoid flying through these depicted areas.

Air Traffic Control and the National Airspace System

The primary purpose of the ATC system is to prevent a collision between aircraft operating in the system and to organize and expedite the flow of traffic. In addition to its primary function, the ATC system has the capability to provide (with certain limitations) additional services. The ability to provide additional services is limited by many factors, such as the volume of traffic, frequency congestion, quality of radar, controller workload, higher priority duties, and the pure physical inability to scan and detect those situations that fall in this category. It is recognized that these services cannot be provided in cases in which the provision of services is precluded by the above factors.

Consistent with the aforementioned conditions, controllers shall provide additional service procedures to the extent permitted by higher priority duties and other circumstances. The provision of additional services is not optional on the part of the controller, but rather is required when the work situation permits. Provide ATC service in accordance with the procedures and minima in this order except when:

1. A deviation is necessary to conform to ICAO Documents, National Rules of the Air, or special agreements where the United States provides ATC service in airspace outside the country and its possessions
2. Other procedures/minima are prescribed in a letter of agreement, FAA directive, or a military document
3. A deviation is necessary to assist an aircraft when an emergency has been declared

Coordinating the Use of Airspace

ATC is responsible for ensuring that the necessary coordination has been accomplished before allowing an aircraft under their control to enter another controller's area of jurisdiction.

Before issuing control instructions directly or relaying through another source to an aircraft that is within another controller's area of jurisdiction that will change that aircraft's heading, route, speed, or altitude, ATC ensures that coordination has been accomplished with each of the controllers listed below whose area of jurisdiction is affected by those instructions unless otherwise specified by a letter of agreement or a facility directive:

1. The controller within whose area of jurisdiction the control instructions are issued
2. The controller receiving the transfer of control
3. Any intervening controller(s) through whose area of jurisdiction the aircraft will pass

If ATC issues control instructions to an aircraft through a source other than another controller (e.g., Aeronautical Radio, Incorporated (ARINC), FSS, another pilot), they ensure that the necessary coordination has been accomplished with any controllers listed above, whose area of jurisdiction is affected by those instructions unless otherwise specified by a letter of agreement or a facility directive.

Operating in the Various Types of Airspace

It is important that pilots be familiar with the operational requirements for each of the various types or classes of airspace. Subsequent sections cover each class in sufficient detail to facilitate understanding regarding weather, type of pilot certificate held, and equipment required.

Basic VFR Weather Minimums

No pilot may operate an aircraft under basic VFR when the flight visibility is less, or at a distance from clouds that is less, than that prescribed for the corresponding altitude and class of airspace. *[Figure 15-8]* Except as provided in 14 CFR part 91, section 91.157, "Special VFR Weather Minimums,"

Basic VFR Weather Minimums				
Airspace			Flight Visibility	Distance from Clouds
Class A			Not applicable	Not applicable
Class B			3 statute miles	Clear of clouds
Class C			3 statute miles	1,000 feet above 500 feet below 2,000 feet horizontal
Class D			3 statute miles	1,000 feet above 500 feet below 2,000 feet horizontal
Class E	At or above 10,000 feet MSL		5 statute miles	1,000 feet above 1,000 feet below 1 statute mile horizontal
	Less than 10,000 feet MSL		3 statute miles	1,000 feet above 500 feet below 2,000 feet horizontal
Class G	1,200 feet or less above the surface (regardless of MSL altitude).	Day, except as provided in section 91.155(b)	1 statute mile	Clear of clouds
		Night, except as provided in section 91.155(b)	3 statute miles	1,000 feet above 500 feet below 2,000 feet horizontal
	More than 1,200 feet above the surface but less than 10,000 feet MSL.	Day	1 statute mile	1,000 feet above 500 feet below 2,000 feet horizontal
		Night	3 statute miles	1,000 feet above 500 feet below 2,000 feet horizontal
	More than 1,200 feet above the surface and at or above 10,000 feet MSL.		5 statute miles	1,000 feet above 1,000 feet below 1 statute mile horizontal

Figure 15-8. *Visual flight rule weather minimums.*

no person may operate an aircraft beneath the ceiling under VFR within the lateral boundaries of controlled airspace designated to the surface for an airport when the ceiling is less than 1,000 feet. Additional information can be found in 14 CFR part 91, section 91.155(c).

Operating Rules and Pilot/Equipment Requirements

The safety of flight is a top priority of all pilots and the responsibilities associated with operating an aircraft should always be taken seriously. The air traffic system maintains a high degree of safety and efficiency with strict regulatory oversight of the FAA. Pilots fly in accordance with regulations that have served the United States well, as evidenced by the fact that the country has the safest aviation system in the world.

All aircraft operating in today's National Airspace System (NAS) has complied with the CFR governing its certification and maintenance; all pilots operating today have completed rigorous pilot certification training and testing. Of equal importance is the proper execution of preflight planning, aeronautical decision-making (ADM) and risk management. ADM involves a systematic approach to risk assessment and stress management in aviation, illustrates how personal attitudes can influence decision-making, and how those attitudes can be modified to enhance safety in the flight deck. More detailed information regarding ADM and risk mitigation can be found in Chapter 2, "Aeronautical Decision-Making."

Pilots also comply with very strict FAA general operating and flight rules as outlined in the CFR, including the FAA's important "see and avoid" mandate. These regulations provide the historical foundation of the FAA regulations governing the aviation system and the individual classes of airspace. *Figure 15-9* lists the operational and equipment requirements for these various classes of airspace. It is helpful to refer to this figure as the specific classes are discussed in greater detail.

Class A

Pilots operating an aircraft in Class A airspace must conduct that operation under IFR and only under an ATC clearance received prior to entering the airspace. Unless otherwise authorized by ATC, each aircraft operating in Class A airspace must be equipped with a two-way radio capable of communicating with ATC on a frequency assigned by ATC. Unless otherwise authorized by ATC, all aircraft within Class A airspace must be equipped with the appropriate transponder equipment meeting all applicable specifications found in 14 CFR part 91, section 91.215. Additionally, beginning January 1, 2020, aircraft operating in the Class A airspace described in 14 CFR part 91, section 91.225, must have ADS-B Out equipment installed, which meets the performance requirements of 14 CFR part 91, section 91.227.

Class B

All pilots operating an aircraft within a Class B airspace area must receive an ATC clearance from the ATC facility having jurisdiction for that area. The pilot in command (PIC) may not take off or land an aircraft at an airport within a Class B airspace unless he or she has met one of the following requirements:

1. A private pilot certificate
2. A recreational pilot certificate and all requirements contained within 14 CFR part 61, section 61.101(d), or the requirements for a student pilot seeking a recreational pilot certificate in 14 CFR part 61, section 61.94.
3. A sport pilot certificate and all requirements contained within 14 CFR part 61, section 61.325, or the requirements for a student pilot seeking a recreational pilot certificate in 14 CFR part 61, section 61.94, or the aircraft is operated by a student pilot who has met the requirements of 14 CFR part 61, sections 61.94 and 61.95, as applicable.

Unless otherwise authorized by ATC, all aircraft within Class B airspace must be equipped with the applicable operating transponder and automatic altitude reporting equipment specified in 14 CFR part 91, section 91.215(a) and an operable two-way radio capable of communications with ATC on appropriate frequencies for that Class B airspace area. Additionally, beginning January 1, 2020, aircraft operating in the Class B airspace described in 14 CFR part 91, section 91.225, must have ADS-B Out equipment installed, which meets the performance requirements of 14 CFR part 91, section 91.227.

Class C

For the purpose of this section, the primary airport is the airport for which the Class C airspace area is designated. A satellite airport is any other airport within the Class C airspace area. No pilot may take off or land an aircraft at a satellite airport within a Class C airspace area except in compliance with FAA arrival and departure traffic patterns.

Two-way radio communications must be established and maintained with the ATC facility providing air traffic services

Class Airspace	Entry Requirements	Equipment*	Minimum Pilot Certificate
Class A	ATC clearance	IFR equipped	Instrument rating
Class B	ATC clearance	Two-way radio, transponder with altitude reporting capability	Private—(However, a student or recreational pilot may operate at other than the primary airport if seeking private pilot certification and if regulatory requirements are met.)
Class C	Two-way radio communications prior to entry	Two-way radio, transponder with altitude reporting capability	No specific requirement
Class D	Two-way radio communications prior to entry	Two-way radio	No specific requirement
Class E	None for VFR	No specific requirement	No specific requirement
Class G	None	No specific requirement	No specific requirement
*Beginning January 1, 2020, ADS-B Out equipment may be required in accordance with 14 CFR part 91, section 91.225.			

Figure 15-9. *Requirements for airspace operations.*

prior to entering the airspace and thereafter maintained while within the airspace.

A pilot departing from the primary airport or satellite airport with an operating control tower must establish and maintain two-way radio communications with the control tower, and thereafter as instructed by ATC while operating in the Class C airspace area. If departing from a satellite airport without an operating control tower, the pilot must establish and maintain two-way radio communications with the ATC facility having jurisdiction over the Class C airspace area as soon as practicable after departing.

Unless otherwise authorized by the ATC having jurisdiction over the Class C airspace area, all aircraft within Class C airspace must be equipped with the appropriate transponder equipment meeting all applicable specifications found in 14 CFR part 91, section 91.215. Additionally, beginning January 1, 2020, aircraft operating in the Class C airspace described in 14 CFR part 91, section 91.225, must have ADS-B Out equipment installed, which meets the performance requirements of 14 CFR part 91, section 91.227.

Class D

No pilot may take off or land an aircraft at a satellite airport within a Class D airspace area except in compliance with FAA arrival and departure traffic patterns. A pilot departing from the primary airport or satellite airport with an operating control tower must establish and maintain two-way radio communications with the control tower, and thereafter as instructed by ATC while operating in the Class D airspace area. If departing from a satellite airport without an operating control tower, the pilot must establish and maintain two-way radio communications with the ATC facility having jurisdiction over the Class D airspace area as soon as practicable after departing.

Two-way radio communications must be established and maintained with the ATC facility providing air traffic services prior to entering the airspace and thereafter maintained while within the airspace.

If the aircraft radio fails in flight under IFR, the pilot should continue the flight by the route assigned in the last ATC clearance received; or, if being radar vectored, by the direct route from the point of radio failure to the fix, route, or airway specified in the vector clearance. In the absence of an assigned route, the pilot should continue by the route that ATC advised may be expected in a further clearance; or, if a route had not been advised, by the route filed in the flight plan.

If the aircraft radio fails in flight under VFR, the PIC may operate that aircraft and land if weather conditions are at or above basic VFR weather minimums, visual contact with the tower is maintained, and a clearance to land is received.

Class E

Unless otherwise required by 14 CFR part 93 or unless otherwise authorized or required by the ATC facility having jurisdiction over the Class E airspace area, each pilot operating an aircraft on or in the vicinity of an airport in a Class E airspace area must comply with the requirements of Class G airspace. Each pilot must also comply with any traffic patterns established for that airport in 14 CFR part 93.

Unless otherwise authorized or required by ATC, no person may operate an aircraft to, from, through, or on an airport having an operational control tower unless two-way radio communications are maintained between that aircraft and the control tower. Communications must be established within four nautical miles from the airport, up to and including 2,500 feet AGL. However, if the aircraft radio fails in flight, the PIC may operate that aircraft and land if weather conditions are at or above basic VFR weather minimums, visual contact with the tower is maintained, and a clearance to land is received.

If the aircraft radio fails in flight under IFR, the pilot should continue the flight by the route assigned in the last ATC clearance received; or, if being radar vectored, by the direct route from the point of radio failure to the fix, route, or airway specified in the vector clearance. In the absence of an assigned route, the pilot should continue by the route that ATC advised may be expected in a further clearance; or, if a route had not been advised, by the route filed in the flight plan. Additionally, beginning January 1, 2020, aircraft operating in the Class E airspace described in 14 CFR part 91, section 91.225, must have ADS-B Out equipment installed, which meets the performance requirements of 14 CFR part 91, section 91.227.

Class G

When approaching to land at an airport without an operating control tower in Class G airspace:

1. Each pilot of an airplane must make all turns of that airplane to the left unless the airport displays approved light signals or visual markings indicating that turns should be made to the right, in which case the pilot must make all turns to the right.
2. Each pilot of a helicopter or a powered parachute must avoid the flow of fixed-wing aircraft.

Unless otherwise authorized or required by ATC, no person may operate an aircraft to, from, through, or on an airport having an operational control tower unless two-way radio communications are maintained between that aircraft and the control tower. Communications must be established within four nautical miles from the airport, up to and including 2,500 feet AGL. However, if the aircraft radio fails in flight, the PIC may operate that aircraft and land if weather conditions are at or above basic VFR weather minimums, visual contact with the tower is maintained, and a clearance to land is received.

If the aircraft radio fails in flight under IFR, the pilot should continue the flight by the route assigned in the last ATC clearance received; or, if being radar vectored, by the direct route from the point of radio failure to the fix, route, or airway specified in the vector clearance. In the absence of an assigned route, the pilot should continue by the route that ATC advised may be expected in a further clearance; or, if a route had not been advised, by the route filed in the flight plan.

Uncontrolled Airspace

It is possible for some airports within Class G airspace to have a control tower (Lake City, FL, for example). Be sure to check the Chart Supplement U.S. (formerly Airport/Facility Directory) to be familiar with the airport and associated airspace prior to flight.

Ultralight Vehicles

No person may operate an ultralight vehicle within Class A, Class B, Class C, or Class D airspace or within the lateral boundaries of the surface area of Class E airspace designated for an airport unless that person has prior authorization from the ATC facility having jurisdiction over that airspace. (See 14 CFR part 103.)

Unmanned Free Balloons

Unless otherwise authorized by ATC, no person may operate an unmanned free balloon below 2,000 feet above the surface within the lateral boundaries of Class B, Class C, Class D, or Class E airspace designated for an airport. (See 14 CFR part 101.)

Unmanned Aircraft Systems

Regulations regarding unmanned aircraft systems (UAS) are currently being developed and are expected to be published by summer 2016 as 14 CFR part 107.

Parachute Jumps

No person may make a parachute jump, and no PIC may allow a parachute jump to be made from an aircraft, in or into Class A, Class B, Class C, or Class D airspace without, or in violation of, the terms of an ATC authorization issued by the ATC facility having jurisdiction over the airspace. (See 14 CFR part 105.)

Chapter Summary

This chapter introduces the various classifications of airspace and provides information on the requirements to operate in such airspace. For further information, consult the AIM and 14 CFR parts 71, 73, and 91.