CHAPTER 11: AIRSPACE

The national airspace system was developed to allow many types of aircraft to safely use the skies at the same time. In this chapter, you will learn about the different types of airspace and the requirements for using them.

11.1 Why Have Airspace?

Encountering the airspace system for the first time, many student pilots wonder why this complicated, cumbersome system is necessary. To answer this question, we need to look at what goes on in the airspace environment.

The Airspace Environment

In the early days of aviation, there weren't many aircraft in the sky, and instruments allowing safe flight in clouds had not been invented. In this environment, the only airspace rule was to keep an eye outside of the cockpit to make sure you didn't hit another plane. The rule was "see and avoid". If the visibility was less than about one mile, you stayed on the ground.

As technology progressed, gyroscopic instruments were developed which allowed a pilot to fly without the need for visual reference to the horizon, and navigation tools were invented which allowed a pilot to navigate without reference to ground-based landmarks. This meant that airplanes could fly in clouds. This complicated the airspace environment.

When flying in a cloud, it is impossible for a pilot to see other traffic. Fortunately, radar was invented, allowing someone on the ground to keep track of, and direct traffic. Thus, air traffic control (ATC) was born.

To fly in clouds, a pilot must now fly under instrument flight rules (IFR). The pilot must stay in contact with ATC at all times and comply with ATC instructions.

Pilots who don't need to or don't want to fly in clouds can fly under visual flight rules (VFR). Gliders are always required to fly under VFR.

The challenge now is to keep VFR and IFR traffic from colliding. The first thing the FAA did was to divide the sky into the two main categories of airspace: controlled and uncontrolled. In uncontrolled airspace, designated Class G, flight in clouds is not permitted. In most controlled airspace, both VFR and IFR flight are permitted. Most of the sky below 18,000 feet is classified as Class E airspace. Class E airspace is shared by VFR traffic, which is not under ATC, and IFR traffic, which is.

There is still a danger of collision between VFR and IFR aircraft when an IFR aircraft is flying out of a cloud. A VFR aircraft right next to the cloud would not

have enough time to see and avoid the IFR aircraft. This is why the FAA established cloud clearance and minimum visibility requirements for VFR traffic. These requirements will be explained later for each class of airspace.

A busy airport is another area where collisions are possible. To minimize the danger of collision near busy airports, the FAA established areas of positive control (all aircraft flying in a positive control area are directed by ATC) around these airports and established control towers. Even VFR traffic is controlled by ATC when in these airspaces. Different classes of controlled airspace have been created to meet the needs of large (Class B), medium (Class C), and small (Class D) airports. The remaining airports are uncontrolled.

At high altitudes (above 18,000 feet), aircraft speeds tend to be very high, often exceeding 500 mph. With closing speeds of greater than 1000 mph, it can be very difficult to see another aircraft until it is too late to avoid a collision. The airspace above 18,000 feet therefore is controlled airspace, designated as Class A.

The remainder of this chapter will explain in detail each of the classes of airspace, as well as other, special use airspaces. Remember in the following discussion that the procedures explained are for VFR aircraft. The procedures for IFR aircraft are much different as they are directed by ATC during their entire flight.

11.2 Controlled Airspace

Controlled airspace includes Class A, B, C, D, and E airspace. In Classes A, B, C, and D, ATC is mandatory for all aircraft. In Class E, ATC is mandatory only for IFR flights.

The depiction of controlled airspace on aeronautical charts is covered in Chapter 12: Aeronautical Charts and Navigation.

Class A Airspace

Class A airspace and its rules were created to prevent collisions between the high-speed aircraft that fly at high altitudes.

Configuration

Class A airspace extends from 18,000 feet MSL to FL600. (FL stands for flight level. FL600 is 60,0000 feet.) When you are above 18,000 feet, you are required by the FARs to set your altimeter to 29.92 in. Hg.

Entry Procedure

VFR flight is prohibited in Class A airspace unless special permission has been obtained. Some gliderports near mountainous areas have obtained "wave windows" which ATC can open to allow glider flights above 18,000 feet when wave conditions exist. You must be certain that the window is open and that you are in the right area before climbing above 18,000 feet. Normally, the local

gliderport management will coordinate the opening of the wave window with ATC.

Cloud Clearance/Visibility Requirements

When flying in a Class A wave window, you should stay clear of clouds. When a wave window is open, all IFR traffic is routed around the window, so the only other traffic you should have to worry about is other gliders.

Class B Airspace

Class B airspace surrounds the country's most congested airports. The majority of traffic at a Class B airport is commercial airliners. Student pilots are not allowed into most Class B airspace. To fly in the airspace surrounding one of the few Class B airports that do allow student pilots, the student is required to have a logbook endorsement from an instructor allowing the student to fly in that specific airport's airspace.

Aircraft separation is provided by ATC to all aircraft in Class B airspace.

There really should never be an occasion for a glider pilot to enter Class B airspace.

Configuration

Most Class B airspaces are shaped like an upside-down wedding cake, as shown in Figure 11.1.

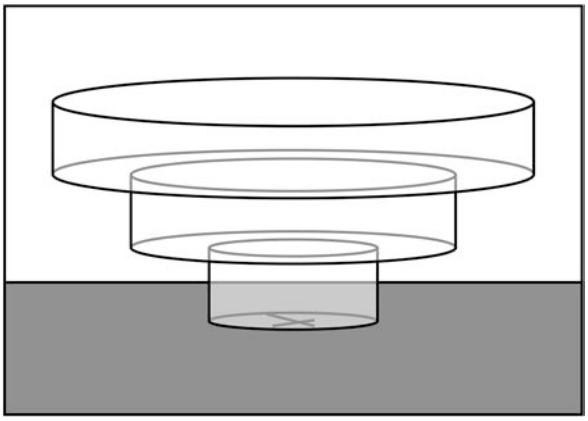

Figure 11.1 – Typical Class B airspace configuration

The configuration allows approaching and departing aircraft to remain in the airspace, while allowing VFR traffic some access to the lower levels near the airport.

Required Equipment

A two-way radio is required to fly in Class B airspace since contact must be maintained with ATC. A mode-C transponder is required to enter Class B airspace so that the controllers will accurately know your position and altitude.

A mode-C transponder is also required within 30 nautical miles (NM) of a Class B airport when below 10,000 feet MSL. This is called the mode-C veil. Aircraft without engine-driven electrical systems (i.e., gliders) are allowed to fly below Class B airspace. They are not allowed to fly above Class B airspace unless at an altitude of greater than 10,000 feet MSL.

Entry Procedure

Before entering Class B airspace, you must obtain ATC clearance.

Cloud Clearance/Visibility Requirements

Since separation services are provided by ATC for Class B airspace, the only cloud clearance requirement for VFR aircraft is that they stay clear of clouds.

Class C Airspace

Class C airspace surrounds airports that have a significant amount of traffic, but less traffic than a Class B airport. In Class C airspace, aircraft separation is provided by ATC only to IFR and special VFR aircraft.

Configuration

Class C airspace usually consists of a 5 NM radius core surface area that extends from the surface up to 4,000 feet above the airport elevation, and a 10 NM radius shelf area that extends from no lower than 1,200 feet up to 4,000 feet above the airport elevation.

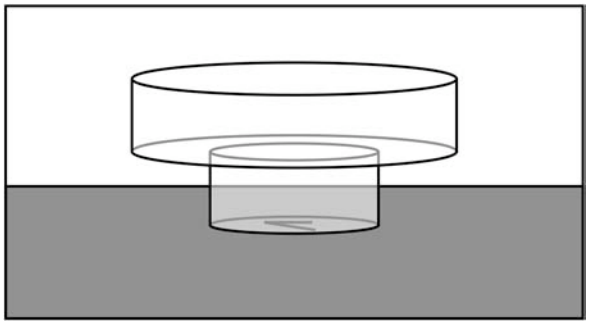

Figure 11.2 – Typical Class C airspace configuration

Class C airspace areas have a procedural "Outer Area". Normally this area is 20 NM from the primary Class C airspace airport. This outer area is not charted.

Required Equipment

A two-way radio is required to fly in Class C airspace since contact must be maintained with ATC. A mode-C transponder is required within and above all Class C airspace up to 10,000 feet MSL.

Aircraft without engine-driven electrical systems (i.e., gliders) are allowed to fly below Class C airspace. They are not allowed to fly above Class C airspace unless at an altitude of greater than 10,000 feet MSL.

Entry Procedure

You must establish two-way radio communication with ATC before entering Class C airspace. If you call ATC and they respond with your registration number, then you are cleared to enter. If they respond with your registration number and the phrase "remain clear of Class C airspace", then you do not have clearance, even though radio communication has been established.

Cloud Clearance/Visibility Requirements

In Class C airspace, you must maintain 500 feet below, 1,000 feet above, and 2,000 feet horizontal separation from clouds. The visibility must be at least 3 statute miles to operate under VFR in Class C airspace.

Class D Airspace

Class D airspace is established around airports with a moderate amount of traffic. At some Class D airports, the control tower is not open 24 hours a day. Class D airspace exists only when the tower is operating. If the tower is closed but weather information is available, then the airspace reverts to surface-based Class E. (Class E airspace will be explained in the next section.) If the tower is closed and no weather information is available, the airspace reverts to Class G.

Since most Class D airports do not have radar, aircraft separation services are not provided in Class D airspace.

Configuration

Class D airspace is usually configured as a 5 NM radius cylinder centered on the runway, extending to 2,500 feet AGL, as shown in Figure 11.3.

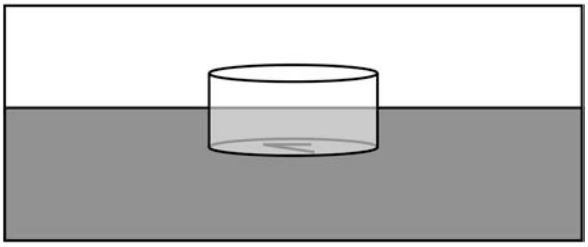

Figure 11.3 – Typical Class D airspace configuration

Required Equipment

Class D airports typically do not have radar coverage, so a transponder is not required; however, a two-way radio is.

Entry Procedures

You must establish two-way radio communication with the control tower before entering Class D airspace. If you call the tower and they respond with your N-number, you are cleared to enter. If they respond with your N-number and the phrase "remain clear of Class D airspace", you do not have clearance, even though radio communication has been established.