Notes From The Washington Counsel

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Basic VFR Weather Minimums

■■ The visual flight rules are based on the "see and avoid" concept. In other words, the visibility from the cockpit must be good enough for the pilot to detect and avoid conflicting traffic. At the heart of the visual flight rules are the VFR weather minimums. These rules place the burden on the pilot to insure that the weather is good enough to enable him to "see and avoid" other traffic as well as ground obstacles. It is important for the pilot to know these rules. But, in many instances, the VFR weather minimums are difficult to understand and to apply. It is not unusual to find VFR pilots applying "1,000 and three" as a general rule because of this difficulty.

The VFR weather minimums are divided into *basic* and *special*. In this article we will attempt to explain the *basic* VFR weather minimums. In a subsequent article we will deal with *special* VFR weather minimums.

In order to simplify our discussion we will devote our primary attention to operations below 18,000 feet mean sea level (m.s.l.). However, it might be well to say a few words about the upper airspace. Area positive control (APC) is in effect from 24,000 feet m.s.l. to 60,000 feet m.s.l. (FL 600), and in some areas from 18,000 feet m.s.l. VFR operations are not permitted in APC. An aircraft operating in APC must be properly equipped (including transponder and usually DME) and must be operated under instrument flight rules by an instrument-rated pilot. Very little VFR flying is done at or above 18,000 feet m.s.l.

We will also confine ourselves to fixed-wing operation. A helicopter has a lower visibility minimum under certain conditions.

THE RULE

Now to the basic VFR weather minimums. Section 91.105 of the Federal Aviation Regulations provides that no person may operate a fixed-wing aircraft under VFR (except Special VFR, to be discussed in the next article) when the flight visibility is less, or the distance from clouds is less, than that prescribed for the corresponding altitude in Table One on the opposite page.

Section 91.105 provides additional minimums for control zone operations. We will consider these later in this article.

First, let us consider the minimums in Table One.

One thing we notice immediately is that when we are operating above 10,000 feet m.s.l. and more than 1,200 feet above ground level (a.g.l.), we do not have to worry about whether we are in controlled or uncontrolled airspace. The visibility and cloud distance minimums are the same regardless of the control nature of the airspace. The minimums are five miles' flight visibility, and 1,000 feet below, 1,000 feet above, and one-mile horizontal distance from clouds. Notice also that these higher minimums do not apply in the airspace immediately above high terrain, i.e., above 10,000 feet m.s.l., but below 1,200 feet a.g.l. This layer of airspace is a VFR regime and it makes more sense to have the lower airspace VFR minimums apply.

Below 10,000 feet m.s.l., we must determine whether the airspace is controlled or uncontrolled, in order to apply the rule. What makes up controlled and uncontrolled airspace below 10,000 feet m.s.l.? According to the regulations, controlled airspace means airspace designated as a continental control area, control area, control zone, terminal control area or transition area. All other airspace is uncontrolled. We could define and explain each one of these airspace segments, but this is not necessary in order to apply our basic VFR weather minimums. All controlled airspace below 10,000 feet m.s.l. is identifiable on the sectional charts. The portion of the Memphis sectional chart illustrates how. [See accompanying chart.]

Except for a control zone, all controlled airspace is color-coded by magenta and blue shadings (tint bands or vignettes). A control zone is identifiable by dark blue dotted lines (T's for control zones where special VFR is prohibited) as shown around Memorial Airport. A control zone may include one or more airports and is normally a circular area with a radius of five statute miles and any extensions necessary to include instrument approach and departure paths. It includes all of the airspace within its boundaries, from the ground up to the base of the continental control area, though as a practical matter we can consider that it has an upper limit of

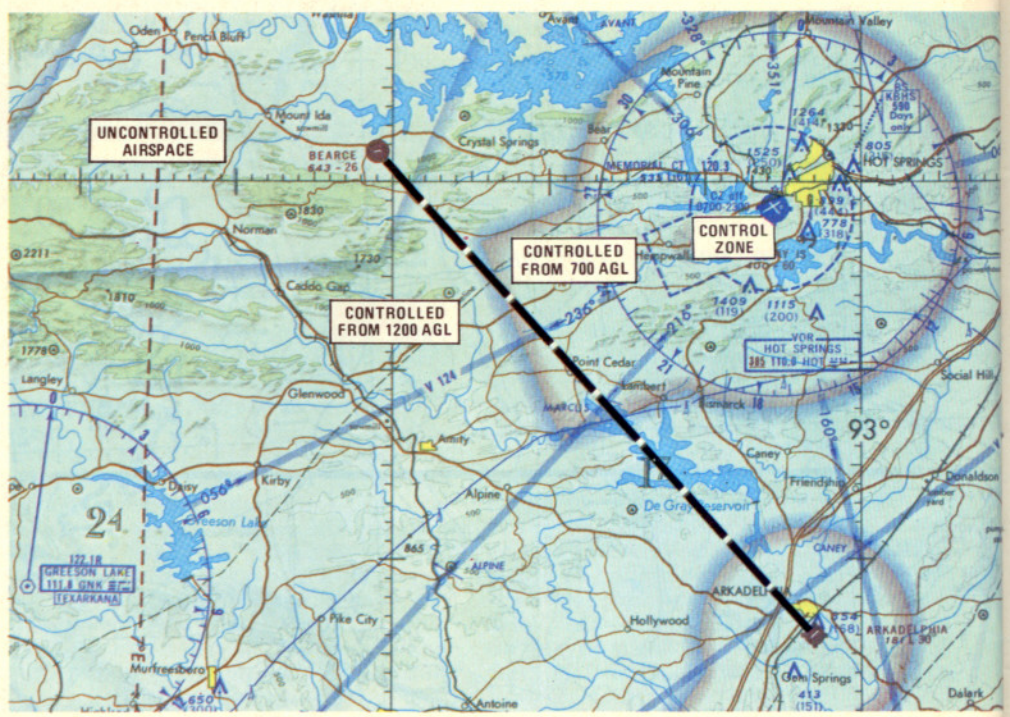

Figure 1. A portion of the Memphis sectional aeronautical chart, illustrating the method of depicting a control zone, controlled airspace having a floor 700 feet above the earth's surface, controlled airspace having a floor 1,200 feet above the surface, and uncontrolled airspace. The limits of controlled airspace are color-coded in magenta and blue. The dark edge of the vignette indicates the limit of controlled airspace, and the vanishing edge the direction of controlled airspace.

10,000 feet m.s.l. The notation "CZ eff 0700–2300" indicates that the control zone is effective from 0700 to 2300 local time.

The magenta and blue shadings on the sectional chart provide the clues to controlled airspace and to uncontrolled airspace. The color coding relates to the height of the floor of the controlled airspace. All controlled airspace is color-coded either magenta or blue, regardless of the type of controlled airspace involved. In the areas bounded by magenta shading, the controlled airspace begins at 700 feet above the ground. In the areas bounded by blue shading, the controlled airspace begins at 1,200 feet above the ground. Sometimes the level is other than 700 feet or 1,200 feet, and in such a case the level in feet will be shown. The dark edge of the shading indicates the limit. The areas outside these boundaries and outside control zones are uncontrolled.

In our illustration, Bearce and Arkadelphia Airports are in uncontrolled airspace, but Arkadelphia has controlled airspace above it which begins at 1,200 feet above the ground. Bearce has no controlled airspace above it until the floor of the continental control area, which is 14,500 feet m.s.l. Since this airspace is above 10,000 feet m.s.l. and above 1,200 feet above the surface, it has no relevance to our consideration of VFR minimums.

With this chart coding we are able to apply our rule below 10,000 feet m.s.l. Within controlled airspace we must have a flight visibility of at least three miles and we must maintain a distance of at least 500 feet below, 1,000 feet above, and 2,000 feet horizontal from clouds. Outside of controlled airspace we must maintain at least one-mile flight visibility. The tricky thing is to apply the distance from cloud minimums outside of controlled airspace. If you are operating at more than 1,200 feet a.g.l. (above ground level), you must maintain at least 500 feet below, 1,000 feet above, and 2,000 feet horizontal from clouds—the same cloud distance requirements as for controlled airspace. However, if you are operating at or below 1,200 a.g.l., your cloud distance minimum is "clear of clouds."

An example may make this clearer. Suppose that we wanted to go VFR from Bearce to Arkadelphia. As we have already noticed, Bearce and Arkadelphia are in uncontrolled airspace. We will plan a direct flight between these two airports, avoiding Memorial's control zone. Suppose further that Memorial is reporting and forecasting 900 feet broken and two miles' visibility. The reported and forecast weather is not necessarily the weather which will be encountered along our route of flight, but it is a good indication of what to expect. Reports and forecasts for the surrounding area provide further verification. Therefore, we can expect that the base of the clouds along our route of flight will probably be around 1,400 feet m.s.l. (900-foot a.g.l. cloud base plus 535-foot m.s.l. airport elevation at Memorial).

After checking the weather and the terrain we conclude that it is possible to fly between these two airports at altitudes which will provide VFR minimums of one-mile visibility and clear of clouds. We know that if we stay in uncontrolled airspace and at or below 1,200 feet a.g.l., these will be our legal minimums. On departure from Bearce, we will be in uncontrolled airspace, with no overlying controlled airspace to worry about until we get to the blue-shaded area. To stay clear of clouds we will probably have to fly very low over the short stretch of high terrain just southeast of Bearce. We very soon enter the blue-shaded area, and as you will recall, controlled airspace begins at 1,200 feet a.g.l. So we must stay below 1,200 feet as we traverse this area.

TABLE ONE

Altitude	Flight visibility	Distance from clouds
1,200 feet or less above the surface (regardless of m.s.l. altitude)—		
Within controlled airspace	3 statute miles	500 feet below 1,000 feet above 2,000 feet horizontal
Outside controlled airspace	1 statute mile	Clear of clouds
More than 1,200 feet above the surface but less than 10,000 feet m.s.l.—		
Within controlled airspace	3 statute miles	500 feet below 1,000 feet above 2,000 feet horizontal
Outside controlled airspace	1 statute mile	500 feet below 1,000 feet above 2,000 feet horizontal
More than 1,200 feet above the surface and at or above 10,000 feet m.s.l.	5 statute miles	1,000 feet below 1,000 feet above 1 mile horizontal

About 11 miles out we penetrate the magenta-shaded area. Magenta indicates controlled airspace beginning at 700 feet a.g.l. If we do not fly above 700 feet a.g.l. while in the magenta-shaded area, we need only maintain our lower minimums. We have the same minimums all the way to Arkadelphia—one mile and clear of clouds—so long as we start descending as the terrain becomes lower. We must fly below 700 feet a.g.l. while in the magenta area, and below 1,200 feet a.g.l. while in the blue area. If we have analyzed the weather correctly, the cloud base at Arkadelphia is still 1,400 feet m.s.l. (approximately 1,200 feet a.g.l.). This gives us ample cloud clearance for an approach to landing. Since Arkadelphia has overlying controlled airspace beginning at 700 feet a.g.l., if the visibility is less than three miles upon our arrival, we must make our traffic pattern below 700 feet a.g.l. (881 feet m.s.l.).

One word of caution. This example is to illustrate the VFR minimums. In planning an actual flight you must consider the weather reports and forecast, the fact that weather varies over time and distance, the nature of the terrain (see high terrain south of Bearce and obstructions 1,830 m.s.l. and 1,730 m.s.l. just west of course), minimum safe altitude requirements, your own capabilities and limitations, and, most importantly, alternate courses of action open to you if the weather is worse than expected.

Another important thing to remember is that the visibility and cloud clearance minimums (outside a control zone) are measured from the cockpit. Legally speaking, it is the weather observed by the pilot which controls, not the reported or forecast weather.

Now let's consider the control zone minimums. With respect to ceiling, Section 91.105 prohibits VFR operations beneath the ceiling in a control zone if the ceiling is less than 1,000 feet. With respect to visibility, it prohibits takeoff, landing or entry into the traffic pattern of an airport in a control zone unless the *reported* ground visibility at that airport is at least three statute miles. If ground visibility is not reported at that airport, then ground and flight visibility must be estimated from the cockpit, and the visibility minimum is three statute miles.

The weather minimums as they apply to a control zone are fairly simple if we are operating to or from an airport at which weather observations are taken, as for example, the airport on which the control zone is based. The minimums are three miles' ground and flight visibility, 1,000-foot ceiling, and required cloud distance. The control zone weather minimums become more complicated if we are operating to or from an airport within the zone which does not report weather, or if we are operating through the zone. The question then becomes: Are we bound by the weather report at the primary airport? The answer is two-fold. We are bound by the ceiling report, but we are not bound by the visibility report. VFR operations at a secondary airport within a control zone are permitted when the necessary visibility of three miles or better prevails at that secondary airport, regardless of whether VFR visibility exists at the primary airport. If we are transiting the area, we can fly through if we maintain at least three miles' visibility, as long as we stay out of the primary airport traffic pattern. But where the ceiling at the primary airport is reported as below 1,000 feet, no VFR operations beneath the ceiling are permitted in the control zone. □