

Guide To VFR Weather Minimums

*AOPA's Washington counsel analyzes the regulations and tells you
in simplified language how to stay legal while flying*

Trying to get around in our national airspace system is sometimes complicated by the fact that the Federal Aviation Regulations governing operations in this airspace are disjointed and difficult to interpret. This series of articles, which will appear in *The AOPA PILOT* from time to time, is an attempt to present to the noninstrument-rated pilot, in nontechnical language, the rules governing flight in our airspace system. They are not intended to be a substitute for the regulations. One of the reasons the regulations are complicated is that they are hopefully drafted to cover every foreseeable situation. This series will attempt to cover the commonly encountered situations. With respect to new or unusual situations, the regulations themselves must be investigated to determine their applicability.

The Structure Of The Airspace

A noninstrument-rated pilot must comply with the weather minimums prescribed for visual flight. What weather minimums apply depends on the particular portion of the airspace in which the flight is conducted. So, our first consideration is the structure of the airspace over the continental United States. The problem in understanding this structure is that it is made up of many parts, some of which are wholly contained in other parts, some of which overlap, and some of which border one on another (Figure 2). In order to make any sense out of this, the pilot's approach should be to learn what these portions of airspace are, and then what requirements are made of him in flying in any one of these parts. And this will be our approach. First we will take a look at these parts and how they interrelate, then we will consider what restrictions are placed on the pilot flying in any one of these parts.

Area Positive Control

The present practical ceiling for flight under VFR is 24,000 feet mean sea level (MSL). This is because area positive control currently is in effect from 24,000 feet to 60,000 feet (technically called flight level 240 to flight level 600) over virtually the entire continental United States. Only properly equipped aircraft (including transponder and DME) operating under instrument flight rules are permitted to fly in this airspace, and the pilots operating these aircraft are required to be instrument rated. An instrument rating is not necessary to operate VFR below 24,000 feet, nor is a transponder or DME equipment required.

Our concern then will be with the airspace below 24,000 feet, since this is the realm of the VFR pilot. (In a recent Advance Notice of Proposed Rule Making, the Federal Aviation Agency is considering lowering area positive control to 10,000 feet or possibly lower along some heavily traveled routes, as well as implementing CVR (Controlled Visual Rules) which would permit VFR pilots to fly in positive control airspace under ATC clearance and with appropriate equipment. See the June 1965 *PILOT*.)

Uncontrolled Airspace

In the airspace below 24,000 feet, we have two major divisions of airspace: controlled airspace and uncontrolled airspace. Controlled airspace does not mean that all aircraft in that airspace are under air traffic control (ATC). Controlled airspace is defined in the Federal Aviation Regulations as airspace designated as continental control

area, control area, control zone or transition area, within which some or all aircraft may be subject to air traffic control. All other airspace is known as uncontrolled airspace.

Controlled Airspace

Continental Control Area. The continental control area (which, strangely enough, is not a control area, but is controlled airspace) is the airspace over the 48 contiguous States, the District of Columbia and part of Alaska, at and above 14,500 feet MSL. But in areas of high terrain it does not include the airspace less than 1,500 feet above the ground (AGL). As we shall see, it is only important because of higher visibility and cloud clearance requirements. It is not depicted on aeronautical charts. If you are at or above 14,500 feet MSL and at the same time at or above 1,500 feet AGL over the 48 contiguous States, you are in the continental control area.

Control Areas—Transition Areas. Superimposed on the divisions of the airspace we have discussed so far is the two-layer airway route structure—jet routes and Federal airways. It is divided at the 18,000-foot level. The jet routes are between 18,000 feet MSL and 45,000 feet MSL (flight level 450), inclusive. The Federal airways over the continental United States exist below 18,000 feet MSL. The Federal Aviation Agency has used this level as an arbitrary dividing line for the two-layer airway route structure after a study of aircraft by type, capability and general altitude usage. FAA determined that this was a realistic ceiling for propeller-driven and turbo-prop aircraft and also a realistic floor for the short-haul jet aircraft.

We have two sets of Federal airways (below 18,000 feet MSL): the VOR airways and the L/MF airways. The

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L/MF airways are based on L/MF navigation aids and are depicted on aeronautical charts by color and number—e.g., Amber One. These airways are obsolete and are almost entirely replaced by the VOR airway system. The VOR airway system is based on VOR/VORTAC navigation aids (omni) and are depicted on aeronautical charts by a "V" ("Victor") followed by the airway number—e.g., V51 running from Shelbyville VOR to Nabb VOR in Figure 1. All of the airspace associated with an airway is controlled airspace and is known as a control area. An airway includes the airspace four nautical miles on each side of its centerline (though it may include more under certain unusual conditions). The airway also includes the airspace extending upward from 700 feet or 1,200 feet above the ground to, but not including, 18,000 feet MSL. In some cases the floor of the airway is above 1,200 feet, in which case it will be indicated by a numerical figure in the blue vignetted line on the sectional chart.

Transition areas are portions of airspace designated usually in conjunction with an airport which has an instrument approach (sometimes designated in conjunction with an airway). It is controlled airspace and extends upward from 700 feet or more above the ground to the base of the overlying controlled airspace.

The magenta and blue shadings (or tint bands or vignettes) on the sectional chart provide the clues to control areas/transition areas and to uncontrolled airspace. 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 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. (See Figure 1.)

Control Zones. The dark blue dotted lines around certain airports on a sectional chart indicate the boundaries of a control zone (e.g., Bakalar AFB in Figure 1). 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, though as a practical matter it has an upper limit of 14,500 feet MSL. Control zones are controlled airspace.

Weather Restrictions

We now have our airspace structured so that we can study our weather restrictions. Remember, VFR flying means flying in accordance with the Visual Flight Rules. These rules are



Figure 1. A portion of the Cincinnati Sectional aeronautical chart, illustrating the method of depicting a control zone, controlled airspace having a floor of 700 feet above the earth's surface, controlled airspace having a floor of 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

designed to provide that the VFR pilot exercising reasonable care will be able to see well enough to avoid collision with the ground, other aircraft and structures which project into the navigable airspace (the "see and be seen" concept). The weather restrictions we will study are minimums. The pilot must exercise judgment in assessing his own limitations and the limitations of his aircraft in determining whether he will operate in conditions at or near minimums on any particular occasion.

Looking first at the vertical structure, we see that from 24,000 feet to and including 14,500 feet (the floor of the continental control area), we have VFR weather minimums of 1,000 feet vertical and one mile horizontal separation from any cloud formation, and five statute miles' flight visibility. Below 14,500 feet MSL in controlled airspace (e.g., along V5 at or above 700 feet AGL in Figure 1), we need at least 500 feet below or 1,000 feet above and 2,000 feet horizontally from any cloud formation, and three statute miles' flight visibility. Below 14,500 feet MSL, outside of controlled airspace at an altitude of more than 1,200 feet above the surface (e.g., over Freeman Airport in Figure 1), we need at least 500 feet below or 1,000 feet above and 2,000 feet horizontally from any cloud formation, and one mile flight visibility. Below 14,500 feet MSL, outside of controlled airspace at an altitude of 1,200 feet or less above the surface (e.g., Figure 1 in the vicinity of Columbus Airport under 700 feet AGL which is the floor of the controlled airspace), we must be clear of clouds and maintain at least one mile flight visibility.

Within a control zone (e.g., over Bakalar AFB at any altitude in Figure 1), the controlled airspace minimums apply. Within a control zone there is the additional limitation that, for operations below the ceiling, the ceiling must be at least 1,000 feet. However, if clearance is obtained from ATC—a "special VFR" clearance—a VFR flight may be conducted in a control zone if flight visibility of at least one statute mile is maintained and the aircraft is operated clear of clouds.

Clearance from ATC is not required for VFR operations in VFR conditions above an undercast in a control zone even if the ceiling is below 1,000 feet. Unless the flight is conducted in the airport traffic area which is below 2,000 feet AGL, it is not subject to ATC. We frequently hear a pilot call a tower and ask for clearance to pass through the control zone. Unless the aircraft is below 2,000 feet AGL, this is unnecessary although, at low altitudes in marginal VFR conditions, it is sometimes desirable to let the tower know where you are.

These minimums apply to takeoffs and landings as well as enroute operations with the addition of ground visibility minimums in control zones. If an airport is in uncontrolled airspace (e.g., Columbus or Freeman), to take off or land we must have at least one mile flight visibility and be able to stay

clear of clouds. If an airport is in a control zone (e.g., Bakalar—if it were available for civil use), we must have a ceiling of at least 1,000 feet and ground visibility of at least three statute miles and be able to maintain at least 500 feet below or 1,000 feet above and 2,000 feet horizontally from any cloud formation, and three statute miles' flight visibility. If a "special VFR" clearance is obtained from ATC, a takeoff or landing can be made at an airport in a control zone even though the ceiling is below 1,000 feet, if ground visibility is at least one statute mile and the operation can be conducted with flight visibility of at least one statute mile and clear of clouds. Operation of an airport rotating beacon during daylight hours means that the ground visibility in the control zone is less than three miles and/or the ceiling is less than 1,000 feet.

Staying Legal

With respect to VFR weather minimums, knowing when you are legal is quite a different thing from knowing how to stay legal. So far, what we have discussed only tells us when we are legal. Now let's give some consideration on how to stay legal. This is especially important in light of the fact that probably most FAA enforcement proceedings against general aviation pilots involve situations where a noninstrument-rated pilot was caught in weather below VFR minimums.

The regulations require that a pilot familiarize himself with all available information concerning a contemplated flight. This information must include available weather reports and forecasts if the flight is to be conducted away from the vicinity of the airport as well as "the alternatives available if the planned flight cannot be completed." It is a good idea for the pilot to examine the weather map and the sequence reports himself. But this is not required. A telephone call to the flight service station or weather bureau meets the requirement. It is a good idea to give the briefer your aircraft number in the event that it is later necessary to establish that you did get a weather briefing. Obtaining the weather by listening to radio broadcasts of aviation weather would also suffice. The controlling criterion is whether you have done what should reasonably be expected of you in obtaining the available weather information pertaining to your contemplated flight. The usual practice of the VFR pilot in cross-country flying is to obtain a flight service station or weather bureau briefing (by telephone or personal visit) before taking off, and to monitor en route the scheduled weather broadcasts at 15 and 45 minutes past the hour (if the aircraft is radio equipped). There is no question in my mind that this practice meets the regulation.

All of us who fly know that weather reports and forecasts are not as reliable as we would like them to be. What is the legal situation if the reports and

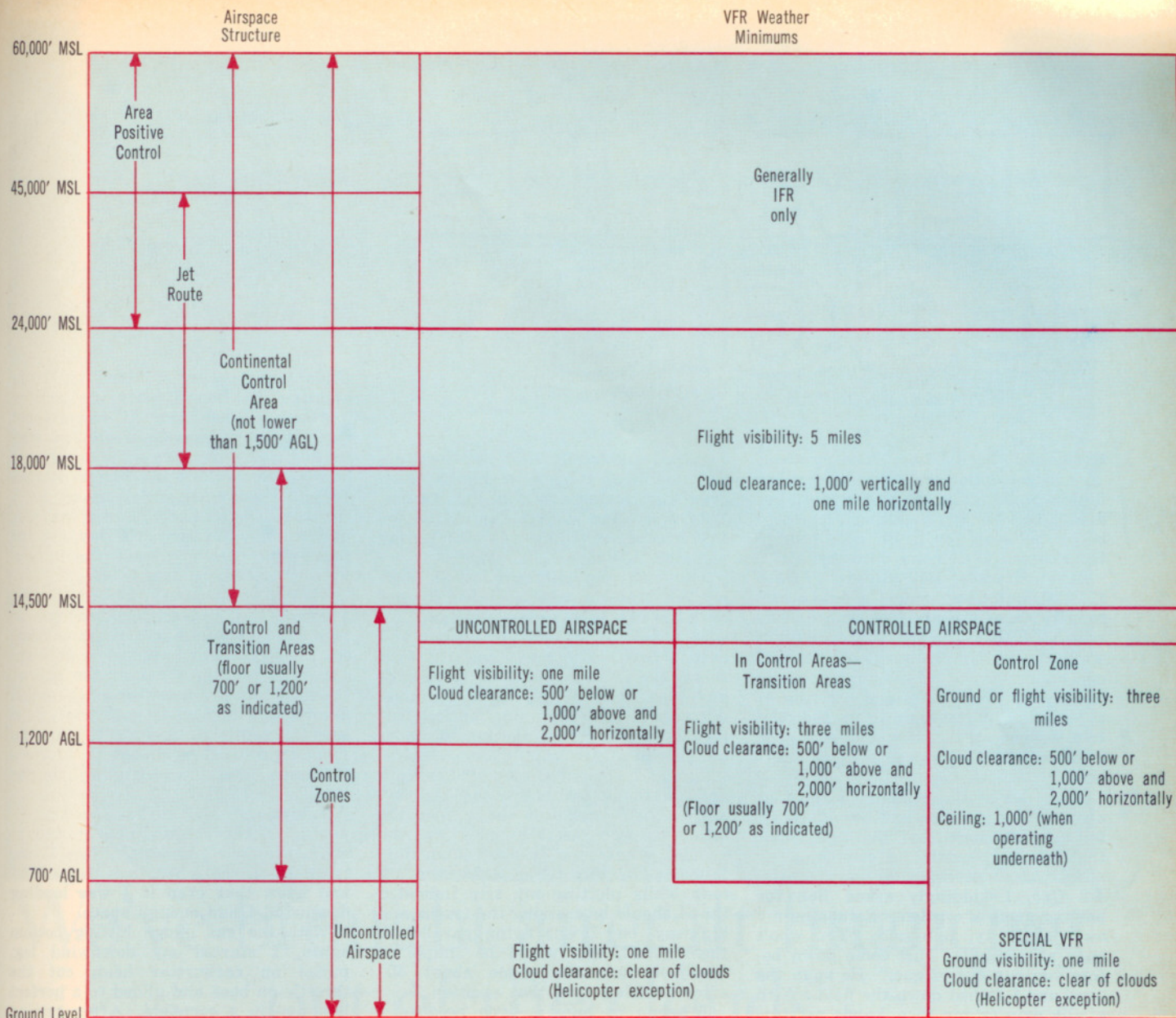


Figure 2 Airspace Structure and VFR Weather Minimums for fixed-wing aircraft over the 48 contiguous states and the District of Columbia

forecasts show VFR conditions, and a pilot encounters IFR conditions? In most cases, the pilot is able to see the weather and either circumnavigate it or return to his base. He must not intentionally enter IFR conditions. However, there are situations in which a pilot inadvertently gets caught in IFR conditions. Has he violated the regulations? Obviously, this is a violation of the VFR weather minimums and would be a violation of the regulations except that the regulations provide that, in an emergency requiring immediate action, the pilot in command may deviate from the VFR minimums to the extent required to meet the emergency. If the emergency situation was not one which reasonably should have been foreseen by the pilot—the emergency situation was not of his own making—there is no violation. If the weather was reported to be, or forecast to be, IFR, and the pilot gets caught in IFR condi-

tions, then he is not excusable. If the reports and forecasts were for VFR conditions and the pilot is not able to return or circumnavigate the weather, then he is excused under his emergency authority. The pilot should be cautioned that this latter situation is extremely rare. In practically all weather-involved incidents, the pilot is flying from VFR conditions to IFR conditions and is able to see the weather deteriorating. Under such a circumstance, he must return or circumnavigate the weather.

A typical situation is a pilot flying VFR over an undercast condition. Unless his destination is reporting or forecasting good (not marginal) VFR conditions, he should not continue. If he does so and is unable to complete his flight VFR, he has violated the regulations. The pilot should periodically check weather at his destination while en route. But, if a pilot is VFR over an

undercast and his destination is reporting or forecasting good VFR conditions, and when he arrives at his destination he is unable to complete his flight VFR and has insufficient fuel to make a VFR airport, then his penetration of IFR conditions is excusable.

It is important that the VFR pilot understand that he has this emergency authority. I have found that VFR pilots who do get caught in marginal weather are fearful of requesting assistance from FAA because they think they have violated the regulations. Two rules the VFR pilot should scrupulously follow are: (1) never intentionally violate VFR minimums, and (2) if you are inadvertently caught in IFR conditions, immediately confess your situation to the nearest FAA facility. Once safely on the ground, you can start battling with FAA about whether your emergency authority was properly exercised. ●