BruceAir's Guide to ATC Services for VFR Aircraft

The primary role of the ATC system is ensuring the safe and efficient flow of IFR traffic, but air traffic controllers also provide many valuable services to VFR pilots, including:

- Assistance in seeing and avoiding other aircraft

- Navigation assistance

- Safety alerts if your altitude and track indicate that you might come close to terrain or known obstructions such as tall radio antennas

- Alerts and navigation assistance to help you avoid restricted and special use airspace (TFR and SUA)

- Guidance during arrivals and departures at busy airports, making operations more efficient and less stressful

- Clearance into Class B airspace

- Coordinating transit through mazes of controlled airspace

- Immediate support during an emergency

Using VFR services is also good practice for VFR pilots who plan to earn an instrument rating and for IFR pilots who want to maintain proficiency working with ATC.

✈ This document is intended to help pilots use the VFR services offered by ATC. Flight instructors may find it helpful when teaching students and customers about these services. Although I've tried to provide accurate, complete, and practical information, this guide is the work of one flight instructor and pilot (with help and advice from several air traffic controllers at facilities around the U.S.). It is not guidance from FAA or a substitute for information from official sources. Obviously, current regulations, FAA policies, and recommendations in the AIM and related resources are, so to speak, "controlling." If you have specific questions about ATC services for VFR aircraft, consult the references included in this document, your flight instructor, and the FAA—including the ATC facilities in the areas where you fly.

Various ATC facilities, including terminal radar approach/departure controls (TRACON) and air route traffic control centers (ARTCC), provide radar services. Some control towers, typically at the primary airport in Class B and Class C airspace, also provide radar services.

TRACON typically control the airspace within approximately 30 nm of an airport to handle departing, arriving, and transient aircraft. ARTCC, known as "centers," handle en route traffic and provide ATC services at many airports not served by control towers and TRACONs.

✈ You can find a general description of VFR services in Chapter 13 of the *Pilot's Handbook of Aeronautical Knowledge*. For more information about the ATC system, see Chapter 9, "The Air Traffic Control System," in the *Instrument Flying Handbook* and Chapter 1, "IFR Operations in the National Airspace System," in the *Instrument Procedures Handbook*.

Limitations on VFR Services

Most ATC facilities are eager to provide services to VFR aircraft, but it's important to understand that VFR services are available only when a controller's workload permits. If the controller in your area is too busy handling IFR traffic or is already working with many VFR pilots, you may not be able to participate.

VFR services depend on radar, and they may not be available in areas of poor radar coverage, especially at lower altitudes in mountainous areas, and when radar or communications equipment is out of service.

ATC may terminate VFR services at any time (provided you're not inside Class B or Class C airspace), so it's important always to have a plan B in mind, especially if you're using VFR services to help you navigate congested airspace.

Your Responsibilities: A Note from AIM 4-1-18

As you learn about and use VFR services, keep the following admonition from the AIM in mind:

These services are not to be interpreted as relieving pilots of their responsibilities to see and avoid other traffic operating in basic VFR weather conditions, to adjust their operations and flight path as necessary to preclude serious wake encounters, to maintain appropriate terrain and obstruction clearance, or to remain in weather conditions equal to or better than the minimums required by 14 CFR section 91.155. Whenever compliance with an assigned route, heading and/or altitude is likely to compromise pilot responsibility respecting terrain and obstruction clearance, vortex exposure, and weather minimums, [ATC] should be so advised and a revised clearance or instruction obtained. (AIM 4-1-18[e])

In other words, when you're operating VFR—even when you're in contact with ATC—*you* are responsible for seeing and avoiding other aircraft, remaining in visual meteorological conditions (VMC), avoiding terrain and obstacles, and staying clear of wake turbulence. Advise ATC as early as possible if you need to deviate from instructions or clearances to comply with those responsibilities.

→ It's also important to ensure that you and ATC mutually understand one another. If you have any doubt about an instruction or clearance from ATC, ask for clarification. Controllers much prefer repeating or clarifying an instruction or a clearance rather than scrambling to deal with a pilot who does something unexpected or contrary to instructions.
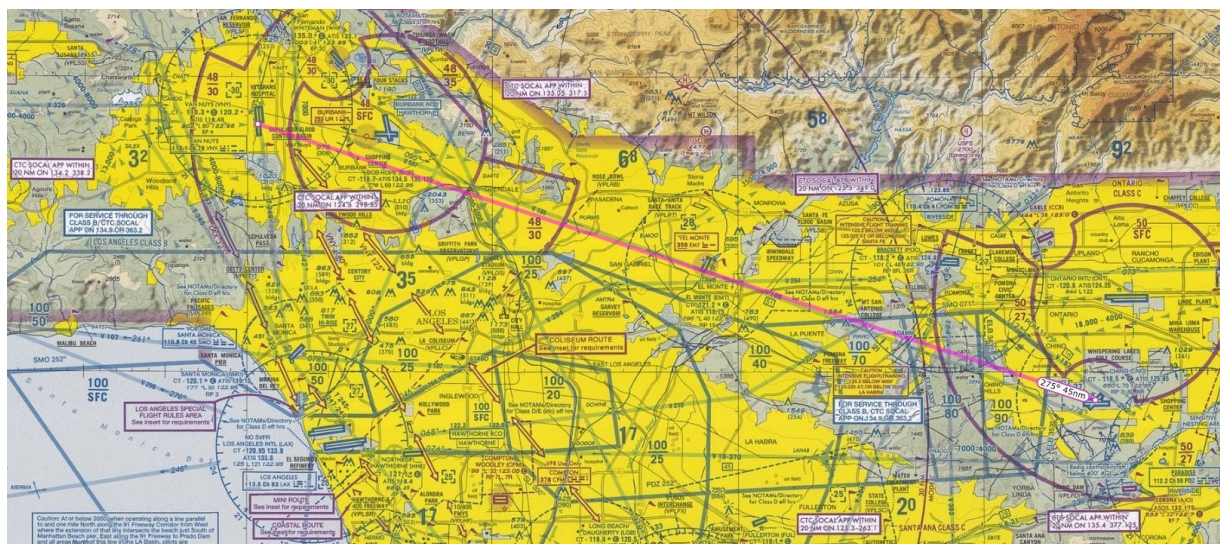
Flight Following

Most of the VFR services provided by ATC fall under the general term "flight following," a phrase commonly used by pilots and air traffic controllers. Flight following includes routine ATC services provided to VFR aircraft that are traveling en route and operating in or around busy airspace.

A formal name for the service, defined in the AIM and *Pilot/Controller Glossary* (P/CG), is "traffic advisories," but that phrase doesn't describe the full range of services that ATC provides to VFR pilots.

You can request flight following at any time, even on local flights that remain outside high-density airspace such as Class C and Class B airspace.

The following sections provide basic information about communicating with ATC and offer practical guidance for using VFR services in several common situations.

VFR services from ATC can help you navigate the complex airspace and air traffic in congested areas like Los Angeles, even when you remain outside Class B and Class C airspace.

✈ *Flight following does not automatically permit operation in Class B airspace*. You must always receive an *explicit clearance* to enter and operate within Class B airspace (for example, "Cessna 1234A, cleared to operate in the Seattle Class B airspace" or "Cessna 1234A, cleared to operate in the Seattle Class Bravo airspace"). If you want to transit, climb, or descend through Class B airspace, request and receive a clearance from ATC. You should acknowledge such clearances explicitly—not with just your call sign (for example, "Cessna 34A cleared into the Class Bravo"). For more information, see AIM 3-2-3: Class B Airspace and Section 9: Class B Service Area–Terminal in *Air Traffic Control*.

Finding ATC Frequencies

The following sources can help you locate information about the best facility to contact and the frequencies to try first:

- VFR terminal, sectional, and WAC charts
- Airport/Facility Directory (A/FD)
- Database of ATC frequencies in a GPS or aviation application

- Instrument approach/departure charts
- IFR low altitude en route charts

After you establish contact with ATC, controllers provide the frequencies to use as you cruise through the airspace of adjoining facilities and sectors. You can learn more about handoffs between ATC facilities later in this document.

✈ If you are airborne and can't find a specific ATC frequency in these sources, based on your present position and the information on your charts or other references, contact the nearest flight service station, tower, TRACON or ARTCC. Give the FSS specialist or controller your location relative to an airport or VOR. The FSS specialist or controller can provide a specific frequency to use.

## VFR Terminal, Sectional, and WAC Charts

VFR charts don't include TRACON or ARTCC frequencies in the information blocks associated with specific airports, VORs, and airways. But you can find frequencies for radar services in boxes associated with Class B and Class C airspace and in frequency tables in the legends and information tabs of the charts.

✈ FAA AeroNav Products, which publishes aeronautical charts, plans to restrict access to its digital products, including VFR and IFR charts, the A/FD, and instrument procedure charts, probably sometime in 2012. For the latest information about these developments, visit the FAA AeroNav Products website.

ATC Frequency Boxes on VFR Charts

If you are flying near Class B airspace, you can find frequency boxes for ATC on the appropriate terminal area chart. The excerpt from the San Francisco terminal area chart shows frequency boxes for Norcal Approach.

You can use these frequencies for initial contact with ATC if you're flying in the designated areas, even if you are not heading to the airports within the Class B or Class C rings.
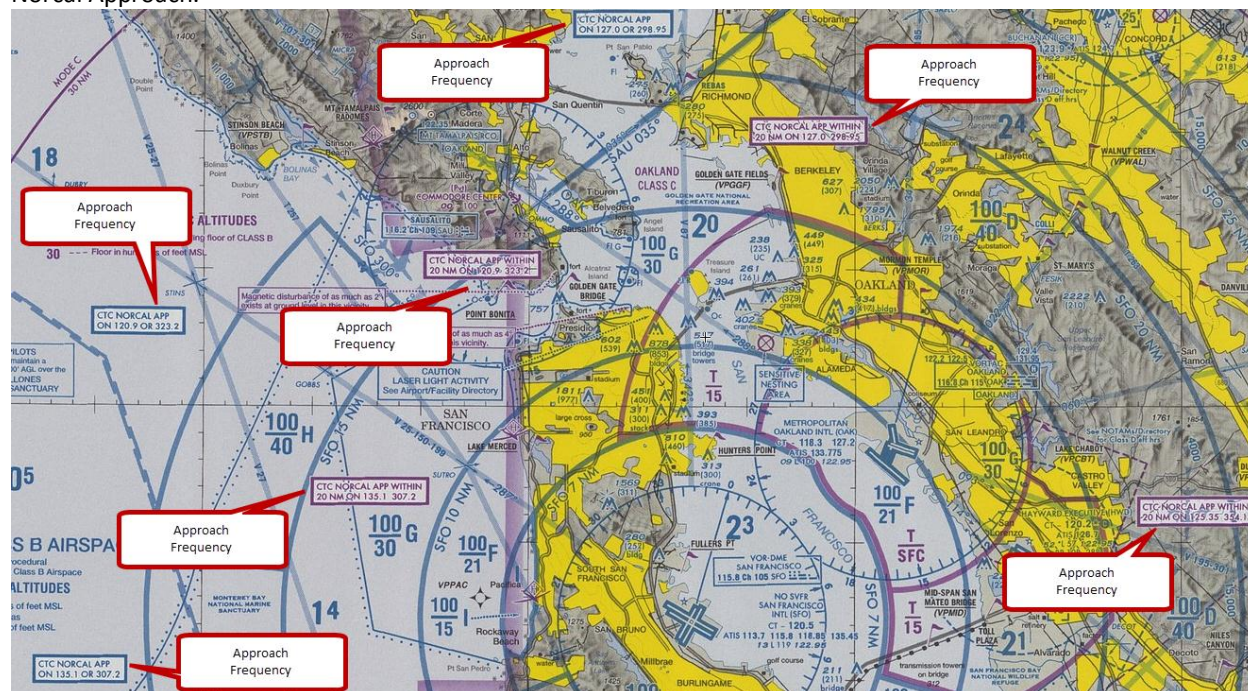
Frequency boxes on the San Francisco terminal area chart

The following excerpt from the Omaha sectional chart shows the frequencies for Des Moines approach control east and west of the Class C airspace.

You can use these frequencies for initial contact with ATC if you're flying in the designated areas, even if you are not heading to the airports within the Class C rings.
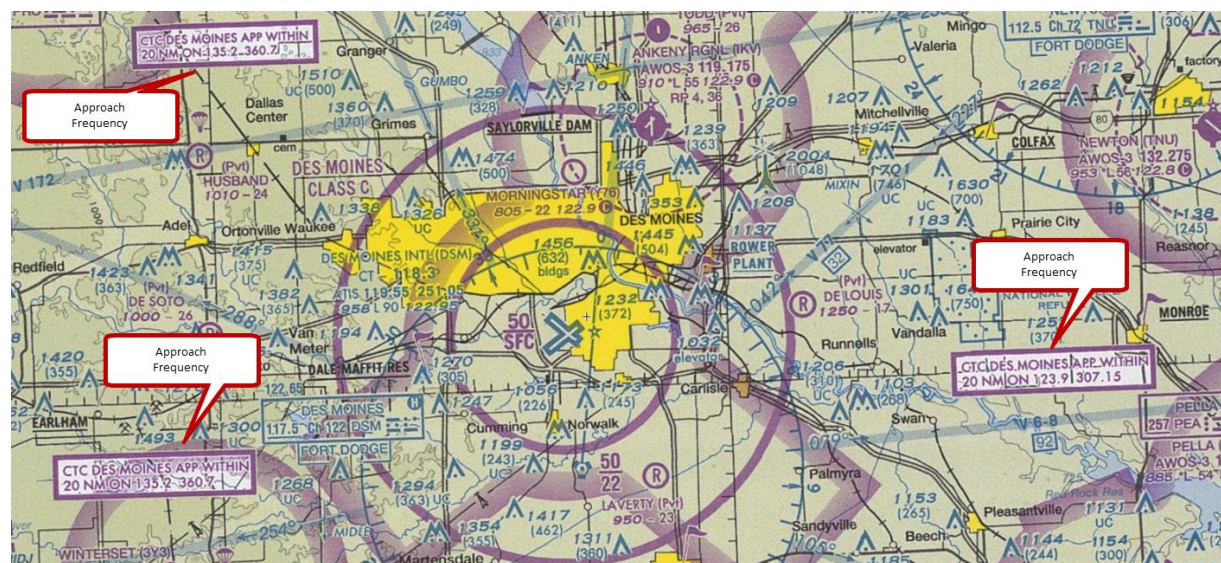
The Des Moines, IA area as shown on the Omaha sectional chart. Note the frequency boxes for Des Moines approach control.

Frequency Tables and Insets on VFR Charts

If you are not flying near Class B or Class C airspace, you can find some ATC frequencies in tables printed outside the borders of VFR charts.

This excerpt shows part of the ATC frequency table from the Seattle sectional chart.

ATC frequencies in a table from the Seattle sectional chart

Such tables also include frequencies for ATC facilities that control SUA in the area covered by the chart.

VFR Flyway Charts

The reverse sides of VFR terminal charts often include diagrams that show recommended routes and altitudes for VFR traffic operating around and under Class B airspace.

The diagrams include some ATC frequencies and include descriptions of common procedures and routes.

Note that some of the suggested routes on flyway charts help you remain clear of the Class B airspace. Other routes require a clearance from ATC to operate inside the Class B airspace.

Review these charts carefully before operating in and around Class B airspace.

Some VFR charts also include insets for busy airports. The insets show ATC frequencies, VFR reporting points, and other information.

The Portland area inset from the Seattle sectional chart
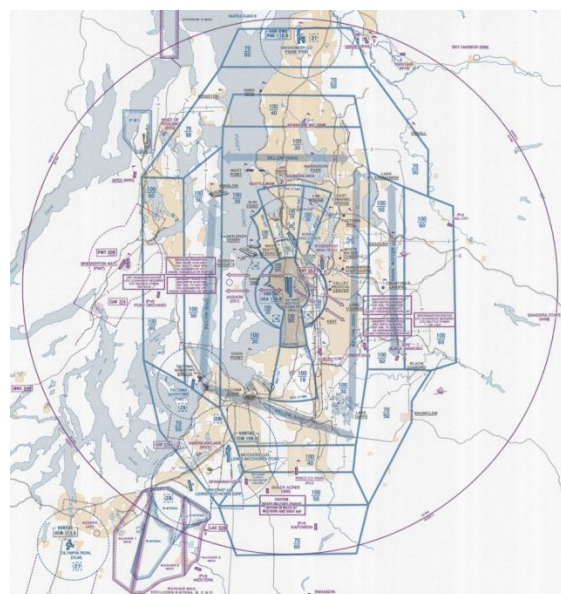
Reverse side of the Seattle terminal area chart showing VFR flyways

Airport/Facility Directory (A/FD)

The following excerpts from the A/FD show where air traffic control frequencies appear in typical listings for airports served by instrument approaches. (The letters *IAP* in the upper-right corner of the listing for an airport indicate that it has instrument approaches.)

You can use this information to find the best frequency for initial contact with ATC if you're flying to, from, or near an airport with instrument approaches.

For example, the following excerpt for the Bend, OR (KBDN) airport, which does not have a control tower, indicates that Seattle Center, an ARTCC, provides approach/departure services in the airspace around Bend on frequency 128.15

If the A/FD listing for an airport doesn't include ATC frequencies (usually because the airport is not served by instrument approaches), check the listings for other nearby airports and try one of the provided frequencies.

The A/FD listing for Bend, OR (KBDN)

Unofficial Sources

SkyVector.com, AirNav.com, and other web-based services aren't official sources of information, but they're handy references if you don't have the A/FD.

Flight-planning applications, such as ForeFlight and WingX, also provide ATC frequencies.

Supplemental Information in the A/FD

The supplemental information in the A/FD, included after the detailed airport listings, includes frequencies for ARTCCs. Unfortunately, the frequencies are referenced to the names of remote communications outlets (RCO), not to a chart.

Unless you know where the RCOs are located, it's often difficult to use these listings to find the best frequency to use. Note that frequencies printed in bold are for use at and above flight level 180.

Database of ATC frequencies in a GPS or Aviation Application

Some of the applications reproduce information as it appears in the A/FD; GPS units typically list frequencies on tabs associated with airports. To learn how to retrieve and display ATC frequencies, see the help functions and user guides for the devices and applications that you use.

The "nearest" function of a GPS unit typically includes a tab for ARTCCs, which can be handy when you are en route. Note, however, that the lists of ARTCC frequencies don't always account for airspace that an ARTCC shares with TRACONs, and sectors within an ARTCC are often adjusted based on current traffic loads.

If you contact a center using one of the "nearest" frequencies, the controller may instruct you instead to contact a TRACON or other ARTCC sector on another frequency. If you're flying to, from, or near an airport that has instrument approaches, you can use the database in your GPS or tablet application to find approach/departure and ARTCC frequencies.

Frequency list for KBRD as shown in ForeFlight on an iPad.

You can also use the database in a GPS or aviation application to find the appropriate ATC frequencies for Class C and Class B airspace.

Instrument Approach/Departure Charts

If you have access to instrument approach/departure charts (available online and in aviation apps such as ForeFlight and WingX), you can find ATC frequencies for airports along your route of flight.

The TRACON and ARTCC frequencies for an airport are listed at the top of each approach chart.
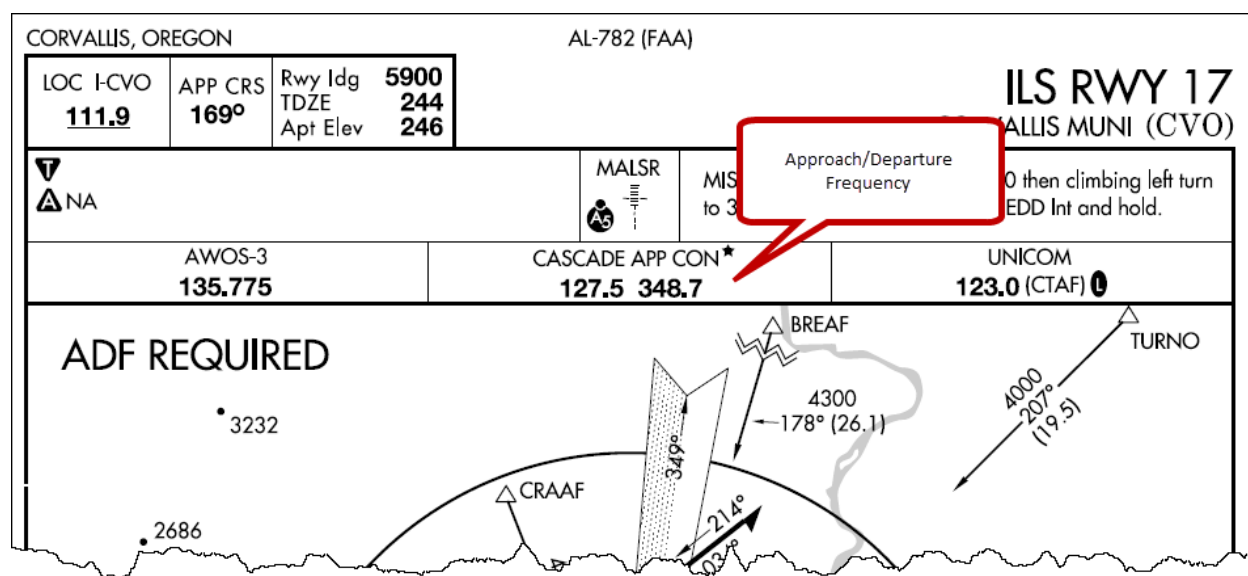
A typical approach chart showing the approach/departure control frequency for Corvallis, OR (KCVO)

IFR Low Altitude En Route Charts

Low-altitude IFR en route charts show ARTCC frequencies in boxes with scalloped edges.

You can check these charts before you fly and note the frequencies for VFR radar services along your planned route.

Part of the IFR low-altitude en route chart for the Atlanta, GA area

Before You Contact ATC

Before you contact ATC for VFR services, be prepared to provide the information described in this section as you establish communications with the controller.

You shouldn't try to provide *all* of the information in your *first* transmission, but have the details handy so that you can answer the controller's questions accurately and efficiently.

(At the end of this document, you can find a kneeboard form to help you organize this essential information for use in the cockpit.)

Remember that as you make your first transmission, the controller must:

- Scan the radar display to find your aircraft's data block to confirm that you are calling the appropriate facility.

- Communicate with other aircraft already on the frequency.

- Coordinate with other ATC facilities.

- Enter your aircraft identification, type, and other information into the ATC computer.

If the controller doesn't answer your initial call immediately, wait a minute or so before trying again.

✈ Beyond the basic guidelines described in AIM 4-2-3: Contact Procedures, there's no absolute rule for what to say in all initial calls to ATC. Some controllers prefer receiving complete information from the pilot; others want only your aircraft type, call sign, and position. The circumstances of your initial call (for example, calling for taxi clearance versus requesting flight following when already cruising en route) typically suggest the best way to establish contact. You also have to apply common sense. If the frequency is crowded with transmissions when you tune in, don't overwhelm the controller with a long, complicated request. Introduce yourself to the party by providing the essential information (your aircraft identification and position), and then wait for the controller to request the details. Limiting your initial transmission also helps the controller confirm, based on your position and altitude, that you've contacted the correct facility or sector.

Information to Provide to ATC

Keep the following information at hand when you request or use VFR services:

- Complete aircraft identification—aircraft type and registration (typically your N-number), as described in AIM 4-2-4. Aircraft Call Signs

- Official aircraft type designator—the model number for your aircraft (for example, C172, BE36, or PA28). You can find lists of official aircraft type designators in the appendices to FAA Order 7110.65, Air Traffic Control (fixed-wing aircraft are listed here). Some controllers also prefer that you provide the equipment code (for example, /G, /A, or /U) that tells ATC about the transponder and navigation equipment onboard your aircraft. For equipment codes, see AIM Table 5-1-2.

- Your position relative to a nearby airport, VOR, or other waypoint designated on an aeronautical chart. It's usually not necessary to give a precise mileage (to the fraction of a mile) or a specific radial/bearing. For example, just say, "Seattle Center, Cessna 1234A, 8 miles southwest of Pullman VOR." If you have a GPS, you can use the nearest function to quickly determine your position relative to a nearby airport or VOR.

- Altitude—Some controllers prefer that you state your current altitude in your initial call; others like to confirm it after they've established communication with you.

- Destination (including the official airport identifier as shown on a chart, listed in the A/FD, or included in Section 6, "Assignment Listings," of JO 7350.8P, Location Identifiers), or your intentions (for example, sightseeing, flight training maneuvers, or practice approaches under VFR). Providing the official airport identifier is especially important on flights to airports that lie outside the current ATC facility's local airspace.

- Route of flight via airways, VORs, or other waypoints. It's generally not necessary to describe a complete, detailed routing that includes every waypoint, but providing controllers with a general idea of your intended route helps them coordinate with adjacent ATC sectors and facilities. For example: "VFR to Spokane–Felts Field via victor 2," "VFR to bravo victor uniform via Reno," or "VFR to eight-zero tango via Baker City."

- Intended cruising altitude, in accordance with §91.159 VFR cruising altitude or flight level.

As noted earlier, the information that ATC needs may vary depending on when and where you make your initial request.

For example, if you're cruising en route and contact an ARTCC, the list above is a good guideline. However, if you are on the ground preparing to depart, ATC obviously needs to know your specific location on the airport, and the clearance delivery or ground controller will need your initial heading or intended course, destination (or intentions), and planned cruising altitude.

The following sections provide examples of how to contact ATC in several common situations.

✈ Controllers have lists of all the IFR aircraft in their sectors, including aircraft that are expected to depart an airport or enter their airspace from another facility or sector. If you're VFR and not on the list or being handed off, controllers assume you probably want flight following. It's OK to ask for flight following in your initial call to ATC, but it usually isn't necessary to add "request" or "VFR request" at the end of that first transmission. The controller assumes that you want something (after all, you called) and can quickly determine that you're VFR.

Communications: General Guidance

Here's some helpful general guidance from "Let's Be Clear," a feature in the May/June 2011 edition (PDF) of _FAA Safety Briefing_:

Be brief on initial check-in. This is mainly an issue when pilots are VFR. State call sign and request VFR flight following. Then, just answer the controller's questions briefly, such as position, aircraft type, and destination; additional information usually ties up the frequency. You can contact the controller later to ask questions or provide additional information. Use your judgment: You can usually tell when a controller is busy, so use that as a guide to how you use the frequency.

Be attentive to the frequency, especially when VFR. If a pilot asks for flight following, it is distracting to a controller when the pilot does not answer communications, especially traffic calls. Since there can be so many reasons why a pilot does not answer a call, it takes the controller's focus away from IFR traffic.

Especially in inclement weather, **ask controllers for deviations as many miles in advance as possible.** This allows controllers to plan for other traffic and coordinate with other ATC sectors or facilities. Also, be prepared to go with an alternate plan if at all possible, such as deviations to right instead of left, if that is what you requested.

Give controllers PIREPS (pilot reports)! Controllers can share the information with other pilots and get a more accurate picture of what the weather is doing.

Ask, do not assume! If you do not understand a clearance, use the words "Confirm" or "Verify." Controllers prefer to repeat or clarify a clearance (even when they are busy) rather than have a pilot execute the wrong clearance, which may cause problems for other aircraft in the sector.

Readbacks

When you communicate with ATC, controllers expect to you read back (confirm) key instructions. The general guidelines for readbacks are in AIM 4–4–7: Pilot Responsibility upon Clearance Issuance. (That section is intended primarily for IFR operations, but the standards for good radio etiquette apply to all conversations with ATC.)

The key paragraphs for VFR pilots are (b) and (c), which note that:

- Pilots of airborne aircraft should read back those parts of ATC clearances and instructions containing altitude assignments, vectors, or runway assignments as a means of mutual verification. The read back of the "numbers" serves as a double check between pilots and controllers and reduces the kinds of communications errors that occur when a number is either "misheard" or is incorrect…
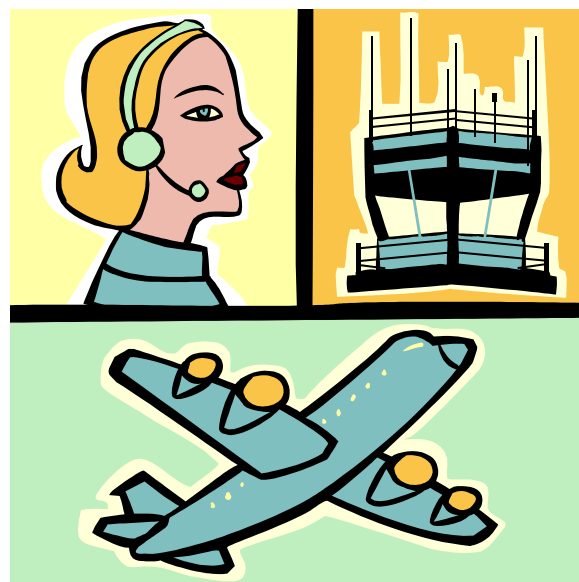
- Include the aircraft identification in all readbacks and acknowledgments. This aids controllers in determining that the correct aircraft received the clearance or instruction. The requirement to include aircraft identification in all readbacks and acknowledgements becomes more important as frequency congestion increases and when aircraft with similar call signs are on the same frequency.

That section of the AIM also offers these specific details:

- Read back altitudes, altitude restrictions, and vectors in the same sequence as they are given in the clearance or instruction.

- Initial read back of a taxi, departure or landing clearance should include the runway assignment, including left, right, center, etc. if applicable.

Controllers also prefer that you read back frequencies when you are told to switch to a new controller.

Departure/Arrival at Class B and Class C Airports

Operations at the primary airport in a Class B area require a *specific clearance* from ATC, while operations in Class C airspace require only *two-way communications*.

As a practical matter, however, the procedures you follow when departing, arriving, and transiting Class B and Class C airspace are similar.
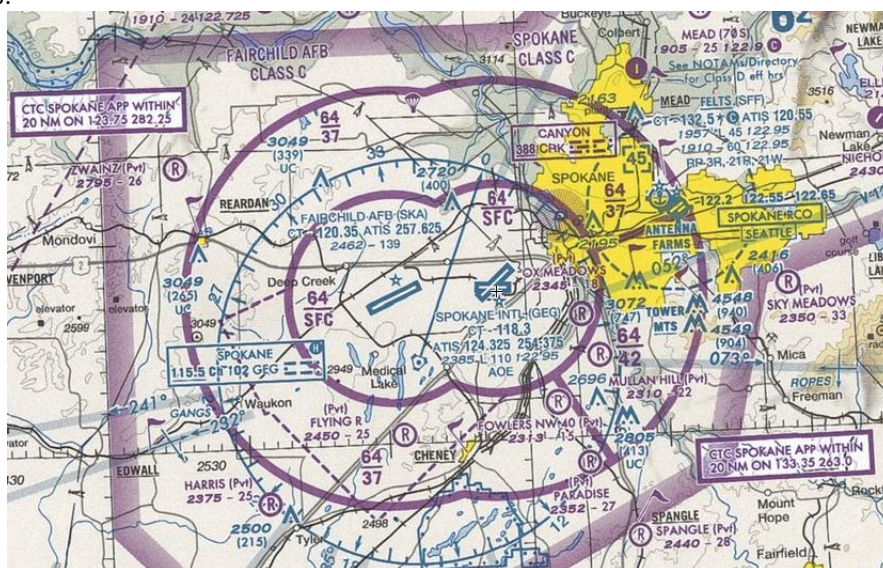
The Class C airspace around Spokane, WA (KGEG)

Departure

Here are the basic steps to follow to obtain a departure clearance (from the primary airport in Class B airspace) or to establish communication with ATC (at Class C airports):

- Before you contact ATC, listen to the ATIS. Many Class B airports have separate departure and arrival ATIS frequencies; consult the airport diagram or A/FD to ensure that you listen to the appropriate ATIS.

- Contact clearance delivery (if available) or ground control on the frequency shown on

the airport diagram. Give your aircraft identification, type, and location on the airport. State that you are VFR and your intentions—usually your destination, initial course or heading, and planned cruising altitude. For example, "Spokane clearance, Cessna 1234A, south ramp, VFR to Boeing Field, initial course 230 at 8,500."

- The controller will reply with a transponder code and a frequency for departure control. You may also receive a specific heading to fly after takeoff, an initial altitude restriction, or other instructions. Read back that information.

- When you are ready to taxi, contact ground control. Repeat your location on the airport, and tell the controller that you have the current ATIS code (include the letter; for example, "information Golf") and your clearance (Class B) or departure instructions (Class C). For example, "Spokane ground, Cessna 1234A, south ramp with information Tango and VFR departure instructions southwest." The controller will reply with a taxi clearance to the appropriate runway.

- With reference to the airport diagram, follow the normal taxi and runup procedures, and contact the tower when you're ready for departure, or when instructed by ground control.

- After takeoff, switch to departure control when the tower tells you to change frequencies.

- On initial contact with departure control, state your aircraft identification, that you are VFR, and your altitude. For example, "Spokane departure, Cessna 1234A, VFR, 2,700, climbing 8,500."
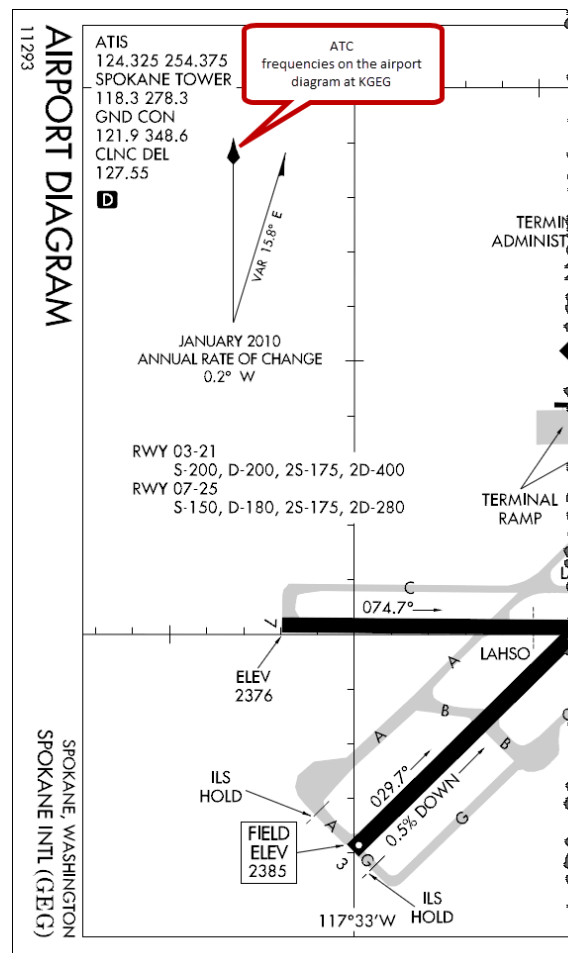
The controller will respond with your aircraft identification and "radar contact." You're on your way. The departure controller will monitor you, issue heading and altitude restrictions as necessary to avoid other aircraft and adjacent airspace, and hand you off to other controllers as you proceed en route.

Unless a controller issues specific headings, routes, or altitudes, you can fly the course and altitude of your choice, consistent, of course, with regulations such as §91.159: VFR cruising altitude or flight level and §91.155: Basic VFR weather minimums and the rules that define and govern operations in different types of airspace.

Arrival

If you are already receiving flight following as you approach a Class B or Class C airport, you'll be handed off to the appropriate approach controller(s) and to the tower as you proceed inbound.

✈ If you are arriving at an airport within or beneath the Class B airspace, you must receive an *explicit clearance* to operate *inside* the Class B airspace.

If you are not already receiving flight following, contact approach control on the appropriate frequency. As noted earlier, give your position and

intentions to the controller during your initial conversation.

✈ You should listen to the arrival ATIS as soon as practical, preferably before you contact approach control.

The controller will coordinate your arrival with the tower. You may receive instructions to fly specific headings and altitudes or traffic pattern legs as you approach the airport (for example, "Fly heading 090

at or below 2,500 for the left downwind to runway 27").

The tower controller should be expecting you and see your aircraft's data block on the tower's radar display. Nevertheless, when you are handed off from approach control, you should provide your aircraft identification, position, ATIS received, and intentions (for example, "Spokane Tower, Cessna 1234A, five miles southwest with information Tango, landing").

Departure/Arrival at Class D Airports

Some towers at Class D airports can coordinate requests for flight following before you take off. Request VFR services when you contact ground control. The controller may issue a transponder squawk code and a frequency for departure control after takeoff. If the tower coordinates flight following, the tower controller will tell you when to contact departure control.

If the tower can't coordinate requests for flight following before departure, the controller can provide a frequency to contact ATC after you clear the Class D airspace. Follow the guidance in "Before You Contact ATC" and "Communications: General Guidance" to establish contact with the TRACON or ARTCC after you are clear of the Class D airspace.

Departure

To ask for flight following, make your request on the ground control frequency before you taxi. As always, listen to the ATIS (if available) and provide your destination so that the controller can coordinate with the appropriate departure controller. For example, "Yakima ground, Cessna 1234A at the fuel pumps with information Tango, request VFR flight following to Spokane–Felts Field."
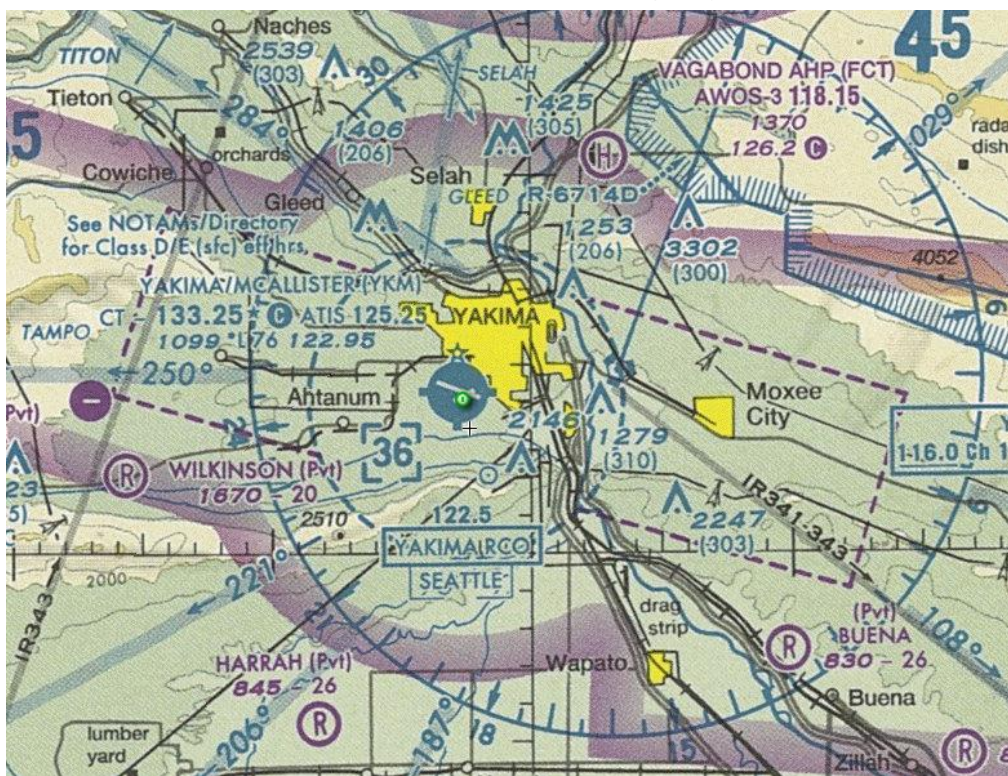
The area around the Yakima, WA (KYKM) airport as shown on the Seattle sectional chart

Arrival

If you are flying to an airport with a control tower, you can often get flight following from an ARTCC or TRACON to help you make a smooth arrival.

Again, if you're already receiving flight following, the radar controller will hand you off to the tower as you approach the airport. Listen to the ATIS (if available) as soon as practical, and let the controller know when you have the current ATIS information.

The approach controller may tell the tower controller to anticipate your arrival, but as always, it's a good idea to make a standard call to the tower on initial contact. For example, "Yakima tower, Cessna 1234A, six miles east with information Tango, landing."

Busy Class D Airports

Some Class D airports operate as if they were inside Class C airspace. For example, controllers at Eugene, OR (KEUG) prefer that inbound traffic contact Cascade Approach for sequencing and traffic advisories. This practice isn't required—KEUG is not surrounded by Class C airspace—but given the volume of traffic, including airline flights and intensive flight training, it's a good idea.

✈ If you're curious about the availability of and preference for using VFR services from ATC at a particular airport, call or email an FBO or flight school in the area and ask an instructor or local pilot about how things work. Or call the ATC facility and talk to the staff.

The procedure for departing a busy Class D airport like KEUG is essentially the same as that used at a Class C airport—but you can decline radar services if you prefer to fly outbound on your own.

Information about such local preferences often isn't explicitly stated in the A/FD and other sources, but if the listing for an airport in the A/FD includes frequencies for approach/departure control, it's a good idea to request VFR services as you approach the area.
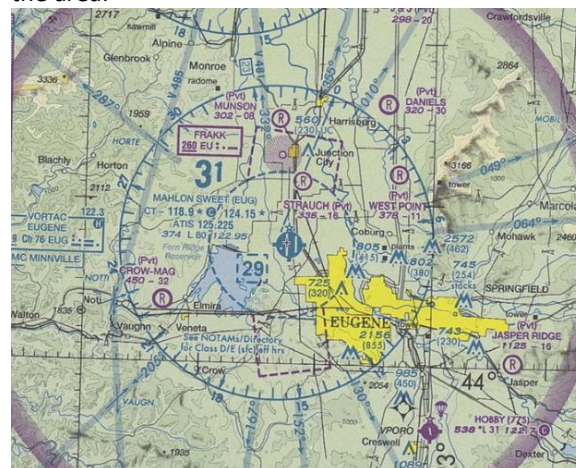
The Eugene, OR airport (KEUG) as shown on VFR charts

Flight Following at Airport without Towers

If you're taking off from an airport without a control tower, use the references described earlier in this document to find the best frequency for initial contact with ATC.

After you are clear of the traffic pattern, follow the guidance in "Before You Contact ATC" and "Communications: General Guidance" to establish contact with the TRACON or ARTCC.

If you are arriving at an airport without a control tower and want flight following, contact the appropriate ATC facility as described earlier in this document.

✈ If your destination provides automated weather observations (AWOS or ASOS; see AIM 7–1–12[b] Automated Weather Observing System [AWOS]), listen to that information as soon as practical and inform ATC that you have the "one-minute weather" for your destination. for more information, see AIM 4–3–26 and the Pilot/Controller Glossary.

Transiting Airspace

When you are receiving flight following, ATC coordinates with other facilities as you fly through different types of airspace. It is the controller's responsibility to coordinate your passage through all airspace (except Class B) as you cruise along. For example, unless specifically told to contact a tower, you don't need to switch to a tower frequency to transit Class D airspace.

Suppose you are cruising at 2500 ft. between the McMinnville, OR (KMMV) and Scappose, OR (KSPB) airports. At that altitude, the direct route (shown below) takes you through the Class D airspace at Hillsboro, OR (KHIO).

If you are receiving flight following from Portland Approach, however, you don't need to contact the tower at KHIO; the approach controller will coordinate your flight through that airspace.

You must be prepared, however, to follow the appropriate regulations and procedures if controller workload or other circumstances force ATC to deny or cancel flight following. And you must comply with instructions, such as headings or altitudes, that the radar controller issues.

Of course, as noted earlier, if your route of flight leads you toward Class B airspace, *you must receive an explicit clearance* to enter that airspace.

✈ If you have any doubt about approval to fly into Class B airspace, ask the controller *well before* you approach the airspace's boundaries.

To help controllers assist you as you transit areas with a variety of adjoining or nearby airspace, make sure that you provide your destination or intentions (such as sightseeing or training maneuvers) when you initially ask for flight following or if your plans change. Don't surprise the controller with a sudden, major change in direction.

The direct route from KMMV to KSPB as shown on the Seattle sectional chart.

✈ Most ATC facilities have letters of agreement (LOA) with nearby facilities to help them coordinate traffic. For example, TRACONs usually have formal arrangements with control towers at airports within the TRACON's airspace. The terms of those LOA allow TRACON controllers to send transient traffic through Class D airspace at certain altitudes without receiving explicit permission from the tower controller. These LOA aren't published in the A/FD or other references readily available to pilots, and they're not noted on charts, but if you are receiving VFR services from a radar controller, it's the controller's responsibility to coordinate your passage through airspace along your route.

Handoffs Between ATC Sectors/Facilities

When you are receiving VFR services from ATC, you are often transferred from one sector to another or to adjoining facilities. For example, after takeoff, the tower hands you off to departure control, which then passes control to an ARTCC as you continue en route. While en route, you fly from one ARTCC sector to another as you cruise.

In most cases, controllers use a semi-automated system for transferring aircraft to their colleagues. As you approach the boundary of a controller's

airspace, the controller tags the data block that represents your aircraft on the radar display. The data block blinks, alerting the next controller that an aircraft is approaching. If workload permits, the new controller clicks the data block to accept the aircraft, and you're told to change frequencies.

As always, acknowledge the frequency change, tune the radio, and listen to make sure that you aren't interrupting another transmission. Because data about your flight follows you when one controller

hands off to another, you don't need to repeat basic information that you provided when you requested flight following. When you're ready to contact the new controller, keep it short and simple. State your aircraft identification, that you're VFR, and your altitude. For example: "Oakland Center, Cessna 1234A, VFR, level 6,500." If the new controller needs more information, such as your destination, he or she will ask.

You don't need to state your position (the controller can see you on radar) or repeat your destination unless you want to change your route of flight or intentions.

Altitude and Course Changes while VFR

When you are receiving services from ATC, you must comply with clearances and instructions, such as headings to fly and altitude restrictions ([§91.123 Compliance with ATC clearances and instructions](#)).

However, unless ATC has issued specific instructions, when you are operating VFR, you choose the course and altitude you want to fly, consistent with the FARs and your responsibilities, as described earlier in this document. When providing flight following, ATC *monitors* your flight—controllers don't usually *control* you except as necessary to avoid other aircraft and airspace and to sequence you efficiently into the flow of traffic.

If you decide to change altitude, it's usually a good idea to *inform* ATC that you're climbing or descending. But unless ATC has specifically issued an altitude restriction, *you don't need to ask for permission* to change altitude. For example: "Portland Approach, Cessna 34A is starting a VFR descent."

The same advice applies to changes in heading or course. If you want to deviate significantly from your current course to avoid weather, terrain, or for sightseeing, tell the controller far enough in advance so that he or she can alert you to potential traffic conflicts and coordinate with other facilities.

Canceling Flight Following

You can cancel flight following at any time you are outside of Class B or Class C airspace and in VMC. For example: "Norcal Approach, Cessna 1234A would like to cancel flight following."

The controller will acknowledge, say "radar services terminated," tell you to squawk VFR, and advise you that you're free to change frequencies.

✈ If you decide to cancel flight following, you must inform the controller. **Don't just leave the frequency and change your transponder code to 1200.** If you stop communicating and don't properly say "goodbye," the controller must initiate search and rescue procedures. If you lose contact with ATC while receiving flight following, use the resources described earlier in this document to contact another ATC facility or an FSS, give your position, and explain that you were receiving flight following. The controller or FSS specialist can relay your information to ATC to cancel flight following or provide a new frequency for you to try.

Leaving the Frequency Temporarily

If you want to contact flight service for information about the latest weather or to update a VFR flight plan, always request permission from ATC before you switch frequencies. If there are no conflicts with other aircraft or nearby airspace, the controller will approve your request and ask you to report when you return to the ATC frequency.

Don't switch from ATC without coordinating with the controller.

Radar Service Terminated

As noted earlier, ATC can cancel flight following at any time, provide you are not in Class B or Class C airspace. ATC will also cancel flight following as you approach airports without control towers.

Controllers will say, "Radar service terminated," tell you to squawk VFR (1200), and clear you to change frequency.

If you are en route when ATC cancels flight following, controllers may provide the name and frequency for another ATC facility that you can contact if you want to resume flight following farther down the road.

If you are inbound to an airport with a control tower, the controller may tell you to "remain on your current transponder code" or "squawk VFR" and then contact the tower.

→ "Radar contact lost" does not in itself mean that ATC has terminated flight following. That phrase usually indicates that you're too low for adequate radar coverage. ATC may pick you up again after you emerge from behind a mountain or fly into an area of better radar coverage. If the controller needs to cancel flight following because your flight path will remain outside of radar coverage for an extended period, you will hear the phrase "radar service terminated," and the controller will tell you to squawk VFR and clear you to change frequency.

VFR Flight Plans and ATC

Many pilots on long flights rely on flight following instead of filing VFR flight plans, and ATC services are a terrific help if you encounter difficulties en route. But as noted earlier, VFR services may not be available, especially at lower altitudes in mountainous and remote areas, and even if you're receiving services from one ATC facility, those services may not be available later in your flight. A VFR flight plan remains your best insurance for search and rescue if you don't reach your destination as expected.

VFR flight plans are filed with and monitored by the flight service station (FSS) network, and VFR flight plans do not typically have an ATC function. In fact, ATC does not routinely have information about VFR flight plans, except flight plans required for international flights and for operating in security-related special-use airspace (for example, the Washington, D.C. Metropolitan Special Flight Rules Area [SFRA] and TFRs established for VIPs like the president).

→ For more information about VFR flight plans, see AIM 5-1-4 Flight Plan—VFR Flights and 5-1-14— Closing VFR/DVFR Flight Plans.

Controllers don't have easy, direct access to information from your VFR flight plan, such as your aircraft identification, type, and equipment, or your proposed route of flight. As noted in "Before You Contact ATC," you should always be ready to provide basic information when you request flight following. Although controllers can communicate with FSS, you should open, update, and close VFR flight plans directly with FSS.

Common Pilot Errors

As I prepared this document, I asked several air traffic controllers about the most common mistakes and breaches of etiquette that pilots make. Here's a quick summary:

- Failing to use standard radio technique and phraseology. Use the resources at the end of this document to hone your communications skills.

- Leaving the frequency without notifying and receiving confirmation from ATC. As noted earlier, if you're receiving flight following and you stop communicating or change your transponder squawk without coordinating with ATC, the controller must initiate search and rescue procedures.

   (The only exception to this rule is when leaving Class D airspace. Unless you receive a specific instruction from a tower controller to remain on the tower frequency, you can change frequency when you are clear of Class D airspace. You don't need to request a frequency change. If you have requested VFR services after takeoff, the tower controller will tell you when to switch to departure control.)

- Failure to read back instructions and clearances—especially runway assignments and instructions to hold short of a runway. Don't reply to ATC with only your identification or "roger."

The controller *must receive a readback of the key information and your call sign.* For example, if a tower controller says, "Cessna 1234A, hold short of runway 27," you must reply, "Cessna 1234A, hold short, runway 27" or "Hold short, runway 27, Cessna 1234A." It's also important to read back frequency changes, altitude restrictions, and other clearances and instructions issued by ATC.

- Stepping on other transmissions when you switch to a new frequency because you didn't listen first.

References and Resources

The following sections provide links to resources (mostly freely available via the web) that can help you understand the details of ATC services for VFR pilots. You may find it helpful to visit FAASafety.gov (where you can find many additional resources and learn about safety programs and seminars in your area) and the following general sources for FAA publications:

- FAA Air Traffic Plans and Publications Library

- FAA Handbooks and Manuals

- FAA Regulatory and Guidance Library

Airspace

- Chapter 14, "Airspace," in the *Pilot's Handbook of Aeronautical Knowledge*.

- Airspace for Everyone (PDF from AOPA Air Safety Institute)

- Know Before You Go: Navigating Today's Airspace (interactive course from AOPA Air Safety Institute)

- Airspace Flash Cards (PDFs from AOPA Air Safety Institute)

- Say it Right! Radio Communication in Today's Airspace (SafetyCast on-demand video from AOPA Air Safety Institute)

The ATC System

For general information about the ATC system, see Chapter 9, "The Air Traffic Control System," in the *Instrument Flying Handbook* and Chapter 1, "IFR Operations in the National Airspace System," in the *Instrument Procedures Handbook* (PDF).

Details about specific services and procedures are in *Aeronautical Information Manual* (AIM).

Radio Communications Phraseology and Techniques, FAA pamphlet P-8740-47 provides a good summary of basic radio technique and procedures. It's available in the online library at FAASafety.gov.

Aeronautical Charts

The *Aeronautical Chart User's Guide* is the primary reference to all symbols and terminology used on charts published by the FAA.

Aeronautical Information Manual

You can view the AIM online here or download a PDF version of the complete document here.

Chapter 4. Air Traffic Control

Section 1. Services Available to Pilots

4-1-8. Approach Control Service for VFR Arriving Aircraft

4-1-13. Automatic Terminal Information Service (ATIS)

4-1-15. Radar Traffic Information Service

4-1-16. Safety Alert

4-1-17. Radar Assistance to VFR Aircraft

4-1-18. Terminal Radar Services for VFR Aircraft

Chapter 5. Air Traffic Procedures

Chapter 6. Emergency Procedures

Many of the details of Section 4 apply specifically to IFR operations, but the general information is useful to all pilots who are using ATC services.

Pilot/Controller Glossary

The P/CG, which describes the vocabulary that pilots and controllers use, is available online here; you can download a PDF version here.

FAA Regulations

§91.113 Right-of-way rules: Except water operations.

§91.121 Altimeter settings.

§91.123 Compliance with ATC clearances and instructions.

§91.155 Basic VFR weather minimums.

§91.157 Special VFR weather minimums.

§91.159 VFR cruising altitude or flight level.

§91.126 Operating on or in the vicinity of an airport in Class G airspace.

§91.127 Operating on or in the vicinity of an airport in Class E airspace.

§91.129 Operations in Class D airspace.

§91.130 Operations in Class C airspace.

§91.131 Operations in Class B airspace.

Free Resources from AOPA Air Safety Institute

AOPA ASI offers many excellent publications, interactive courses, and quizzes. You can use these free resources even if you're not an AOPA member.

Airspace for Everyone (PDF)

Operations at Towered Airports (PDF)

Operations at Nontowered Airports (PDF)

Say Intentions…When you need ATC's help (PDF)

Know Before You Go: Navigating Today's Airspace (interactive course)

Say It Right: Mastering Radio Communication (interactive course)

SkySpotter: PIREPs Made Easy (interactive course)

Airspace Flash Cards (PDF)

Say it Right! Radio Communication in Today's Airspace (SafetyCast on-demand video)

ATC Procedures (Safety Quiz)

Towered Airport Operations (Safety Quiz)

Airspace Review (Safety Quiz)

ATC flight assist quiz (Safety Quiz)

Lost communications quiz (Safety Quiz)

AOPA Flight Training Resources

New Pilot's Guide to ATC Communication

Books and Training Products

Say Again, Please: Guide to Radio Communications (book by Bob Gardner)

Communications Trainer: Say Again, Please (PC-based communications training tool)

COMM1 Radio Simulators

Common Aircraft Type Designators

You can find complete lists of official aircraft type designators in the appendices to FAA Order 7110.65, *Air Traffic Control* (fixed-wing aircraft are listed here). The following list includes designators for some of the most common light aircraft.

Beechcraft

Model Number/Name	ATC Designation
23 Musketeer, Sundowner	BE23
33 Debonair, Bonanza	BE33
35 Bonanza	BE35
36 Bonanza	BE36
55 Baron	BE55
58 Baron	BE58
76 Duchess	BE76

Cessna

Model Number/Name	ATC Designation
150	C150
172 Skyhawk	C172
172 RG Cutlass	C72R
177 Cardinal	C177
177 Cardinal RG	C77R
182 Skylane	C182
182, TR182 (Turbo) Skylane RG	C82R
206 Stationair	C206

Cirrus

Model Number/Name	ATC Designation
SR-20	SR20
SR-22	SR22

Diamond

Model Number/Name	ATC Designation
DA-20	DV20
DA-40	DA40
DA-42 Twinstar	DA42

Mooney

Model Number/Name	ATC Designation
M-20 (A–S), including Allegro, Eagle, Ranger, Ovation)	M20P
M-20 (K/M), including Encore, Bravo, 231, 252, TLS, TSE	M20T

Piper

Model Number/Name	ATC Designation
PA-24 Comanche	PA24
PA-23 Aztec	PA27
PA-28-140/150/151/ 160/161/180/181 Archer, Cherokee, Warrior	PA28A
PA-28-201T/235/236 Cherokee, Cherokee Charger/Pathfinder, Dakota, Turbo Dakota	P28B
PA-28R-1802/3, Turbo Arrow 3/200/201 Cherokee Arrow, Arrow	P28R
PA-28RT Arrow 4, Turbo Arrow 4	P28T
PA-30/39 Twin Comanche, Twin Comanche CR, Turbo Twin Comanche	PA30
PA-32 Cherokee Six, Six, Saratoga, Turbo Saratoga, 6, 6XT	PA32
PA-32R Cherokee Lance, Lance, Saratoga SP/2 HP/2TC, Turbo Saratoga SP	P32R
PA-32RT Lance 2, Turbo Lance 2	P32T
PA-34 Seneca	PA34
PA-38 Tomahawk	PA38
PA-44 Seminole, Turbo Seminole	PA44

Cockpit Form for VFR Radar Services

ATC facility name and frequency	
Aircraft registration (N-number)	
Aircraft type designator and equipment suffix	
Position	
Current Altitude	
Destination name and identifier	
Route (airway and/or key waypoints)	
VFR cruising altitude	

ATC facility name and frequency	
Aircraft registration (N-number)	
Aircraft type designator and equipment suffix	
Position	
Current Altitude	
Destination name and identifier	
Route (airway and/or key waypoints)	
VFR cruising altitude	