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IFR Communications

A Pilot-Friendly® Manual

Master IFR Radio Communications with this Simple Guide

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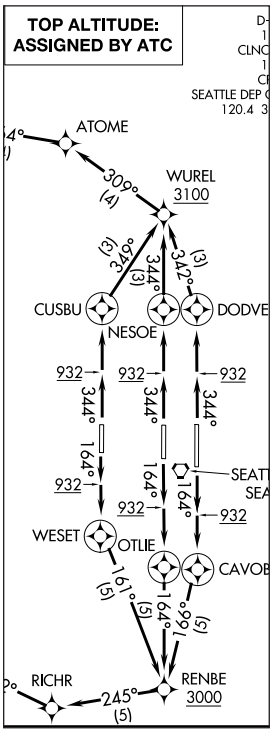
This manual is organized by task. Each task is an *action* you take: request a clearance, contact a new controller, and so on during a flight. The actions tell you quite a bit about the situation: you "announce" your intentions at a non-towered airport, but you "request" permission for them at a towered airport. Think of this list as the 82 most likely or useful IFR communications you'll take part in, even if just listening.

Introduction

Clearances and Ramp Ops



Departures

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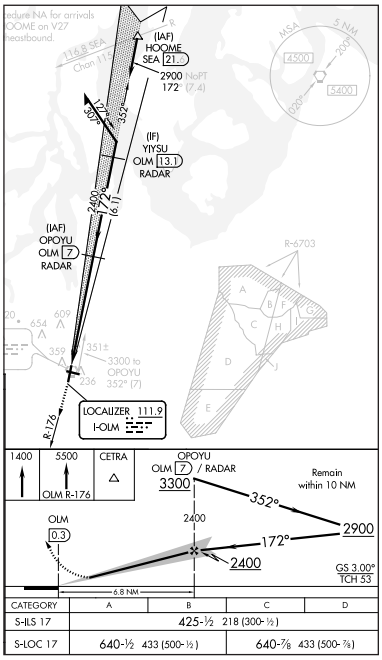

Abnormalities and Emergencies

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Resources and Review

"Instrument flying is an unnatural act, probably punishable by God."

— Gordon Baxter

You're reading the companion volume to a strikingly similar book: *VFR Communications: A Pilot-Friendly Manual*. Writing the IFR volume seemed the thing to do, seeing as many pilots are even more intimidated by IFR communications than they are by VFR communications. Some even shy away from getting instrument rated because of the radio work. This book aims to ease that pain using the same secret that the VFR book did:

Virtually all communications follow a script.

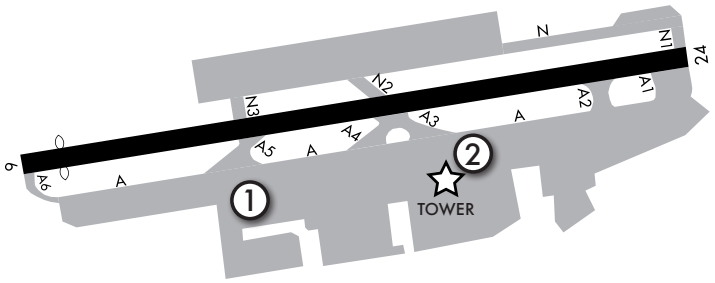
Once you know the basic script, the variations become simple, and that's how this book works. We took the most common, most useful, and most critical IFR radio communications, and created examples of what each party says and where they are when they say it. Discussions beside the scripts expand on these scripts explaining the logic in more detail. Sidebars and tips show variations, and offer insights as needed. Consider the result a field guide to all the things IFR pilots and controllers say in the wild.

Read the audio script for each scenario first. (Tip: You'll be playing the part of "Pilot" today.) Use the numbered ball flags to connect the words with the graphic and visualize what's going on when each call is made. Use the discussions, sidebars, and tips to get a more complete picture. Watch the associated video on the PilotWorkshops website to see and hear the scenario come to life.

You can read the book from start to finish, or jump to the specific communication you want to explore. The book is organized around phase of flight for IFR: Clearances and Ramp Operations, Departures, Enroute Operations, Arrivals, Approach and Landing, Abnormalities and Emergencies, and Special Cases. That last section contains a few unusual IFR procedures that you might only use a few times in your flying career, but you'll be amazed how well they work when the situation comes up. They're also handy on aviation trivia night.

This book addresses both the official radio phraseology, and the real world of aviation communication, so you'll see some non-standard usage and casual comments here and there. That's how it happens in the real world. Not everyone says "niner" when speaking the number nine. However, every single script has been vetted by multiple working

① PILOT
Hello world, this is what I'm saying on the radio. How do you hear?



① Ball flags show who is speaking and (if possible) where the speaker is. This includes Pilot (you), Ground, Tower, and other pilots.

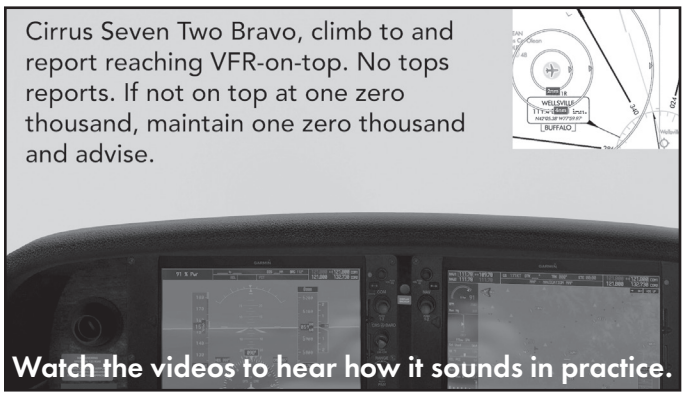
3 This style ball flag appears when the speaker is at a remote location you can't see, such as Approach, Center, Flight Service, or ATIS.

TIP

Tip boxes like this have useful tidbits, like the fact that if a controller doesn't answer right away, he or she may be talking on a radio frequency you can't hear.

SIDEBARS: A BIT MORE INFO

Sidebar boxes delve into topics further than a simple tip. You can read them, or not, as you see fit. Although we think they add useful information relevant to the scenario on that page.



AVIATION ACRONYMS USED IN THIS BOOK AND FOR IFR IN GENERAL

This isn't an exhaustive list, and omits ones only referenced on the page where they are defined.

AGL – Above Ground Level. The distance between you and the forced landing sites below you.

AIM – Aeronautical Information Manual. The book of all things aviation. For comms focus on Chapter 2, sections 1 and 2; and the P/C Glossary.

AIRMET – Airmen's Meteorological Information. Warnings about obscuration (clouds and rain), turbulence, and icing.

ARTCCs – Air Route Traffic Control Centers. The radar rooms at 20 major ATC regions of the continental U.S. Called "Center" on the radio.

ASOS/AWOS – Automated Surface/Weather Observing System. See page 9.

ATC – Air Traffic Control. Usually in reference to the people, as in, "ATC told me to climb."

ATIS – Automatic Terminal Information Service. See page 10.

CT – Control Tower. Abbreviation found on Sectional Charts for the tall building with the antennas on top and the controllers inside.

CTAF – Common Traffic Advisory Frequency. The frequency used by all aircraft announcing their intentions at a non-towered airport. That's "non-towered," not "uncontrolled." CTAF is how pilots collectively keep the situation under control.

D–ATIS – Digital Automatic Terminal Information Service. Like an ATIS, but done in the voice of "the drunken Swede." Big airports often have a Departure ATIS and an Arrival ATIS on different frequencies. Make sure you get the right one depending on whether you're coming or going.

DP – Departure Procedure. It's the generic term for ODPs and SIDs.

DVA – Diverse Vector Area. Areas known only to controller Illuminati that allow vectors below an MIA/MVA. DVAs that assume a 200 foot/NM climb are noted in the departure procedures for that airport.

FAA – Federal Aviation Administration. The people who are always there to help.

FAF – Final Approach Fix. See page 92.

FAR-Federal Aviation Regulation. Also known as "Da regs." Flying IFR means you get almost all the VFR ones and a bunch of new IFR ones.

FBO – Fixed Base Operator. The people who are sometimes there to help, but with things you really need like fuel, coffee, and a rental car.

FSS – Flight Service Station. The people who try to help remotely, and usually do a pretty good job.

GPS – Global Positioning System. Don't know it? Then it's time to leave the island and rejoin society.

GCO – Ground Communications Outlet. It's like an RCO that dials an actual phone.

IAF – Initial Approach Fix. See page 92.

IF – Intermediate Fix. See page 92.

IFR – Instrument Flight Rules. The long list of rules that allow flight in the clouds, but can be used on the sunniest of days.

IMC – Instrument Meteorological Conditions. Sometimes called IFR conditions. Basically: You be in the clouds and better be under IFR.

MAHP – Missed Approach Holding Point. It's the purgatory for IFR pilots who failed to land.

MEA - Minimum Enroute Altitude. Altitude published on a chart below which you're asking for obstacle or terrain trouble.

MEF – Minimum Elevation Figure. A number on VFR charts representing an altitude just barely above the highest obstacle.

METAR – Meteorological Aerodrome Report. The reported hourly weather at an airport.

MIA/MVA- Minimum Instrument (or Vectoring) Altitude. The lowest altitude for your current position where a controller can issue vectors.

MSL – Mean Sea Level. A nearly arbitrary reference by which we measure altitude. Where this book states altitude in "feet," it's feet MSL.

NAS – National Airspace System. The system controllers are sworn to protect and in which we all fly. It's both the space and systems that run it.

NOTAM – Notice to Airmen. A cryptic system for disseminating critical, flight-related info.

ODP – Obstacle Departure Procedure. A textual description of steps you can take not to die when departing an airport unable to see the mountains.

OROCA – Off-Route Obstruction Clearance Altitude. Like an MEF, but 1000 to 2000 feet higher and helpful in IFR route planning.

... AND EVEN *MORE* AVIATION ACRONYMS YOU MIGHT HEAR

PIREP – Pilot (Weather) Report. An eye-in-the-sky snapshot of the actual weather, radioed in.
RCOs – Remote Communications Outlets. Radio transceivers used to contact Flight Service.
RNAV – Area Navigation. Technically, it's any system that allows point-to-point navigation. But unless you have a working KNS 80, it's GPS.
SID – Standard Instrument Departure. Charted procedure to depart an airport. Some only simplify clearances, others are complex procedures.
SIGMET – Significant Meteorological Information. Like AIRMETs, but bigger, badder, and covering more potential hazards.
STAR – Standard Terminal Arrival Route. Like a SID, except there's always a procedure worth a bit of study and they're for arriving, not departing.
TAA – Terminal Arrival Areas. A way to join an instrument approach that's more "zone defense" than "man-to-man."
TEC – Tower Enroute Control (routes). Standardized routes between airport pairs with coded names that you can file, or get surprised by when the appear in your IFR clearance. See page 8.
TPP – Terminal Procedures Publication. The flip books of approach charts that have been supplanted by iPads. Warning: Some TPP info you must specifically download.
TRACON – Terminal Radar Approach Control. An ATC radar room smaller than an ARTCC, controlling airspace near a Class B or Class C airport. Call them "Approach" on the radio.
VCOA – Visual Climb Over Airport. A way to spiral up over the airport instead of flying an ODP.
VFR – Visual Flight Rules. Like IFR, but with a better view and fewer regulations.
VOR – Very High Frequency Omnidirectional Range. An antiquated navigation system that'll be handy if the GPS ever fails. Make great references for your position when talking to ATC.
VMC – Visual Meteorological Conditions. Weather good enough to see where you're going to shrug off the shackles of IFR. Good luck.

controllers and pilots—some of whom argued about what *was* the correct way to say something. These scripts take all that into account. You can decide how to conduct business for yourself.

We model less verbiage wherever practical. Checking in with a new ATC sector, you could say:

> "Hello Portland Departure, this is Cirrus Eight Eight Seven Two Bravo, with you at nine thousand feet, and, uh, there's a big cell ahead of us, so we'd like to go a bit west."

Remove unnecessary words and add specificity in your request to get:

> "Portland Departure, Cirrus Eight Eight Seven Two Bravo, nine thousand. Request fifteen degrees left for weather."

Remember, when you say, "with you at [altitude]" to ATC, some controller rolls his eyes and mutters, "You're not 'with me,' you're 'up there.'"

You don't have to be perfect. You can even crack a joke when radio traffic is light. But brevity leaves more time for the important stuff.

It's a script, so we spell out numbers and phonetic letters, as well as capitalize words like "Tower" when it's a name ("Contact Boston Tower"), but not when it's just a reference ("Contact the tower"). The same is true of runway names: "Runway Two Two."

We assume that you have experience with aviation radios, can tune frequencies, monitor two radios at once, and know what "squawk code" means. We assume you can read aviation charts and supplements. You probably use aviation apps. If something is unfamiliar, there's a reference in the back of the book.

All the examples in this book use real airports and real charts. That said, this book is a snapshot in time, so please don't use it as your reference for the current airport information before a flight.

Other books go into much more detail about each topic covered here. This book focuses on radio communications only. If there's something you don't see here that you think should be included in a future version, please let us know.

It's time to get going, so let's file a flight plan ...

File a Flight Plan via Radio (on the Ground)

① PILOT
Burlington Radio, Cirrus Eight Eight Seven Two Bravo, on the ground at Knapp State. Montpellier RCO on one two two point six.

② FLIGHT SERVICE SPECIALIST
Cirrus Eight Eight Seven Two Bravo, Burlington Radio. Go ahead.

③ PILOT
Cirrus Eight Eight Seven Two Bravo would like to file an IFR flight plan.

④ FLIGHT SERVICE SPECIALIST
Cirrus Eight Eight Seven Two Bravo, ready to copy.

⑤ PILOT
We're a Cirrus SR22 slant Golf, one hundred sixty-five knots. Departing Knapp State—Kilo Mike Papa Victor—at one seven zero zero Zulu, cruise altitude six thousand. Route is Montpelier, Lebanon, BAUER intersection, Bravo Alpha, Uniform, Echo, Romeo, direct. Destination is Concord, Kilo Charlie Oscar November. Estimating five zero minutes enroute. Fuel on board is five hours thirty minutes. No alternate. Pilot name is Jane Earhart. Aircraft is based at Nashua. One person on board. Aircraft is Blue and White.

Edward F Knapp State Airport (KMPV)
Barre, VT
Burlington Radio 122.6

WEATHER DATA SOURCES: ASOS 132.675 (802) 229–2037.
COMMUNICATIONS: CTAF/UNICOM 122.8
MONTPELIER RCO 122.2 122.6 (BURLINGTON RADIO)
BOSTON CENTER APP/DEP CON 135.7
AIRSPACE: CLASS E
RADIO AIDS TO NAVIGATION: NOTAM FILE MPV.

For decades, IFR flight plans were filed by a call or visit to Flight Service. This both filed the flight plan and provided the pilot's weather briefing. Today, most pilots create and file their IFR flight plans via the web or an app, and many self-brief as well.

However, Flight Service is still there via 1-800-WX-BRIEF and by radio right from the cockpit. This is a good trick to know if you're ever without internet or phone. Even at a towered airport, most clearance delivery controllers would rather you file the flight plan with Flight Service.

Look for a FSS Remote Communications Outlet (RCO) frequency in the airport's listing in the Chart Supplement. The actual radio receiver is often co-located with a VOR so the frequency appears on the Enroute Chart above the VOR data block. The name of the Flight Service region appears below the data block. Stand-alone RCO frequencies appear in small boxes prefaced by the FSS name.

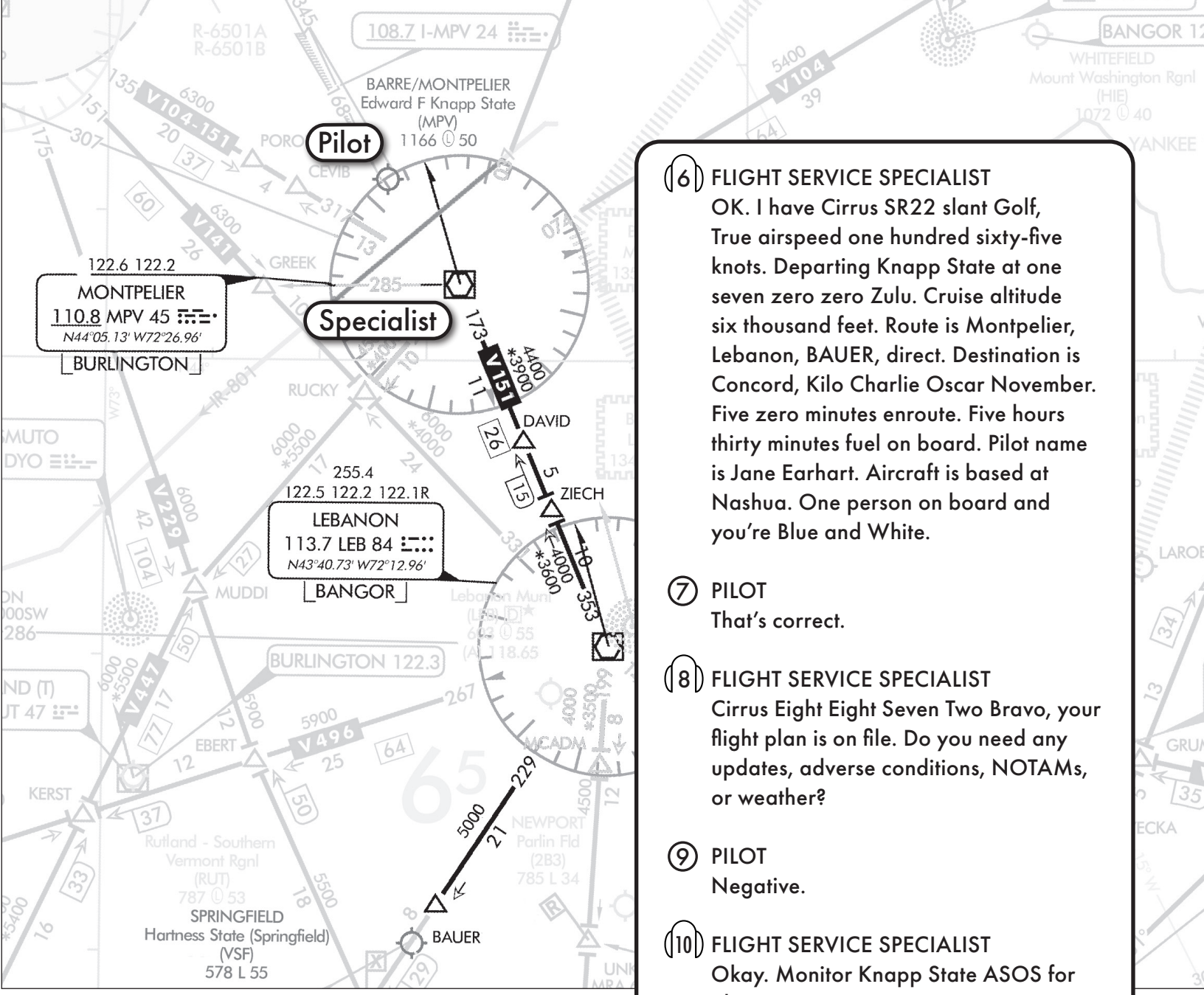
No matter how you contact Flight Service, the initial format for the call ① is the same:

> [Name of FSS Region] Radio, [Full call sign], [Name of remote station or aircraft location], [Frequency used for transmission (optional)].

Before you make the call, fill out a flight plan form so you have all the information the specialist will need in front of you. Read the entire form to the specialist at once ⑤. The FAA flight plan format is:

> [Type of flight plan], [Aircraft call sign], [Aircraft type]/[Equipment], [True airspeed], [Departure point], [Proposed departure time], [Initial cruise altitude], [Route of flight], [Destination], [Hours and minutes enroute], [Remarks (optional)]. [Hours and minutes fuel on board], [Alternate airport (optional)], [Pilot's name and home base (telephone number optional)], [Number of people aboard].

Flight Service specialists cover vast areas, so state the airport identifiers and names to avoid confusion and get the specialist to the right spot on the charts.



(6) FLIGHT SERVICE SPECIALIST
OK. I have Cirrus SR22 slant Golf, True airspeed one hundred sixty-five knots. Departing Knapp State at one seven zero zero Zulu. Cruise altitude six thousand feet. Route is Montpelier, Lebanon, BAUER, direct. Destination is Concord, Kilo Charlie Oscar November. Five zero minutes enroute. Five hours thirty minutes fuel on board. Pilot name is Jane Earhart. Aircraft is based at Nashua. One person on board and you're Blue and White.

(7) PILOT
That's correct.

(8) FLIGHT SERVICE SPECIALIST
Cirrus Eight Eight Seven Two Bravo, your flight plan is on file. Do you need any updates, adverse conditions, NOTAMs, or weather?

(9) PILOT
Negative.

(10) FLIGHT SERVICE SPECIALIST
Okay. Monitor Knapp State ASOS for altimeter setting. Contact Boston Center on one three five point seven.

(11) PILOT
Thanks. Cirrus Seven Two Bravo.

TELL THEM IF YOU'RE FILING ICAO

If your flight plan includes RNAV SIDs and STARS, reaches FL280, or has a destination outside the U.S., you must use the ICAO format. Tell the briefer before you start. The format (and screen the briefer uses) is slightly different:

[Aircraft call sign], [Type of flight plan], [Flight type (optional)], [Aircraft type], [Wake turbulence category], [Aircraft equipment codes], [Departure point], [Proposed departure time], [True airspeed], [Initial cruise altitude], [Route of flight], [Other information (such as PBN details, which apply to many GA aircraft)], [Destination], [Hours and minutes enroute], [Alternate airport (as required)], [Hours and minutes fuel on board], [Number of people aboard], [Aircraft color (optional)], [Pilot contact information].

This excludes some fields that GA pilots rarely use, such as number of aircraft in the flight.

File a Flight Plan via Radio (in the Air)

① PILOT
Prescott Radio, Cirrus Eight Eight Seven Two Bravo. Transmitting on one two two point one, receiving on one one four point eight. Airborne one nine miles northwest of the Stanfield VOR.

② FLIGHT SERVICE SPECIALIST
Cirrus Eight Eight Seven Two Bravo, Prescott Radio.

③ PILOT
Prescott Radio, Cirrus Eight Eight Seven Two Bravo is airborne one two miles northwest of the Stanfield VOR. I'd like to file an IFR flight plan to Truth Or Consequences.

④ FLIGHT SERVICE SPECIALIST
Cirrus Eight Eight Seven Two Bravo, ready to copy.

⑤ PILOT
Cirrus Eight Eight Seven Two Bravo is a Cirrus SR22 slant Golf, one hundred sixty five knots. Departure point is the Stanfield VOR at one niner three zero Zulu. Request one one thousand. Route is Stanfield, Victor Niner Four, San Simon, Victor Two Zero Two, Truth Or Consequences, Direct. Destination is Truth or Consequences Municipal. One hour thirty minutes enroute. Fuel on board is three hours. Alternate is Deming, Kilo Delta Mike November. Pilot Jane Earhart, based at Truth or Consequences. One on board. We're blue and white.

TIP

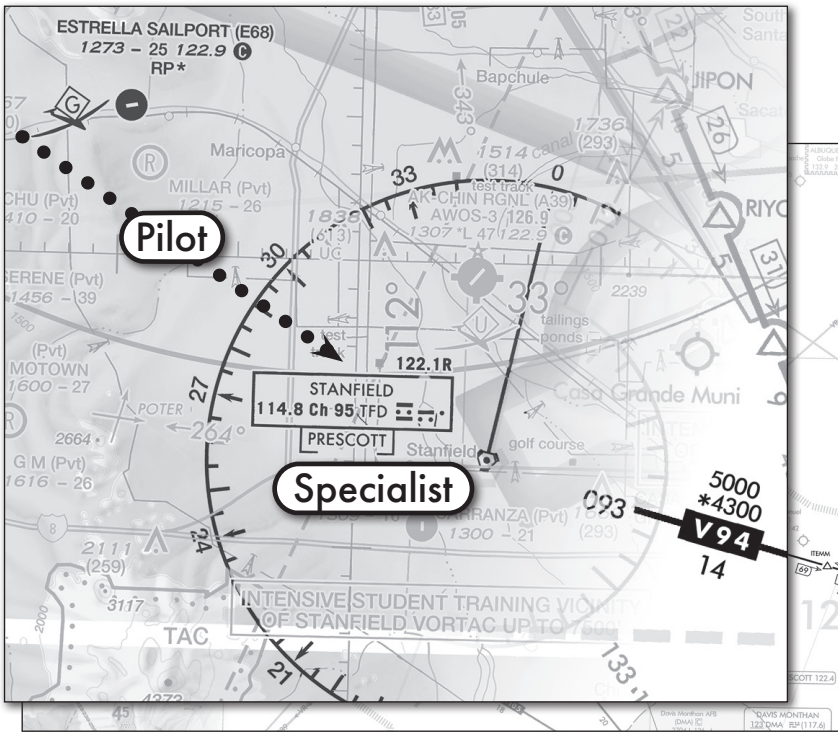
Your route doesn't have to begin at an airport. In this case, it begins at the Stanfield VOR, so that's the "Departure Point" on the flight plan form.

If you're in the air without an IFR flight plan, it's nearly a certainty conditions are visual and you're flying under VFR. However, you might see the weather is deteriorating by your destination. Or, perhaps night is falling, or you've changed your destination to unfamiliar and busy airspace. For whatever reason, if you'd rather finish your flight in the warm blanket of IFR, you need to file a flight plan in the air.

The quickest way is requesting an IFR clearance directly from ATC. (See "Request a 'Pop-up' IFR clearance" on page 124.) That's also best if you're near your destination, or the weather has suddenly deteriorated. However, they can refuse this request.

The surest way is filing with Flight Service from a starting point somewhere ahead of your current position. Use an RCO or a radio co-located with a VOR. FSS frequencies appear above many VOR identification boxes. An "R" means FSS can only receive on that frequency, which means you transmit on it. To receive, you tune and listen to the VOR (114.8 for the Stanfield VOR), usually by pressing a "nav" button on your audio panel and enabling ID/Voice. The FSS region appears below the box (Prescott in this case).

Southeast of Estrella Sailport (E68)
Maricopa, AZ
Prescott Radio 122.1 & 114.8



(6) FLIGHT SERVICE SPECIALIST
Cirrus Eight Eight Seven Two Bravo is a Cirrus SR22 slant Golf, one hundred sixty five knots. Departure point is the Stanfield VOR at one niner three zero Zulu. Cruise altitude is one one thousand. Route is Stanfield, Victor Niner Four, San Simon, Victor Two Zero Two, Truth Or Consequences. Destination is Truth Or Consequences Municipal. One hour thirty minutes. Fuel on board is three hours. Alternate is Kilo Delta Mike November. Pilot Jane Earhart, based at Truth Or Consequences. One on board. Aircraft is blue and white.

(7) PILOT
Readback correct! I always wanted to say that. Cirrus Seven Two Bravo.

(8) FLIGHT SERVICE SPECIALIST
Cirrus Eight Eight Seven Two Bravo, your flight plan is on file. Casa Grande altimeter two eight niner eight. Do you need any updates, adverse conditions, NOTAMs, or weather?

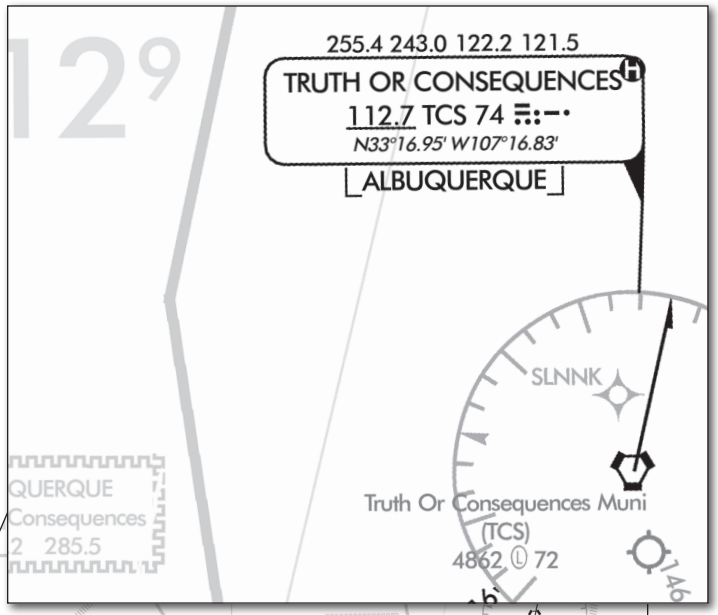
(9) PILOT
Nope, that's it. Thanks.

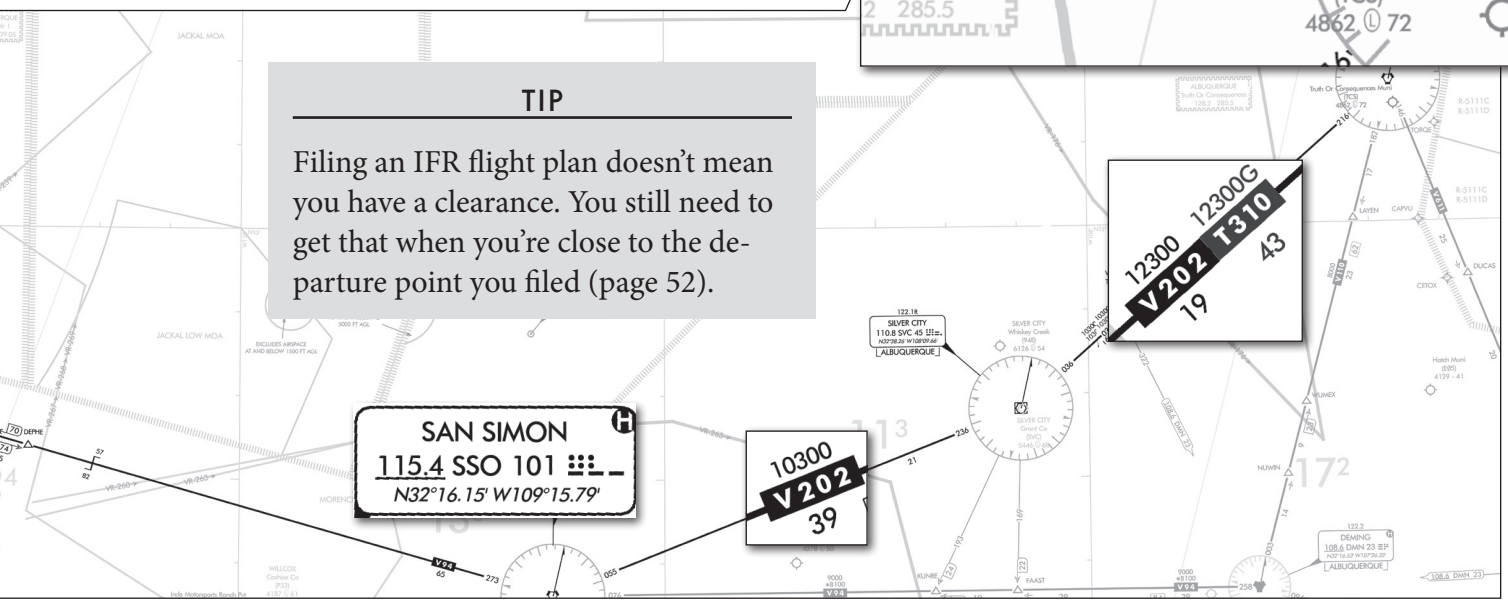
(10) FLIGHT SERVICE SPECIALIST
Your last name is Earhart and you're flying to Truth Or Consequences. That sounds ominous.

(11) PILOT
Yeah, you're not the first person to point that out.

(12) FLIGHT SERVICE SPECIALIST
I'll bet. Good luck.

(13) PILOT
Thanks. Have a good day. Cirrus Eight Eight Seven Two Bravo.





TIP

Filing an IFR flight plan doesn't mean you have a clearance. You still need to get that when you're close to the departure point you filed (page 52).

TIPS ON FILING IFR FLIGHT PLANS FOR SAFETY AND PRACTICE

Even when the sky is crystal clear, IFR can greatly simplify travel into unfamiliar or complex airspace, and provide a bulletproof system for staying clear of terrain and finding your destination runway after dark. To keep current on those procedures, you need to use the system regularly and practice in the system. Too many pilots do their instrument practice under VFR. Here are a couple tips for practice on an actual IFR flight plan:

Put "Multiple low approaches" in your remarks section. This is a heads up to a controller that you don't have a runway destination but want many approaches without landings. Often you'll be greeted on check-in with ATC by, "Say first approach request."

Consider a round-robin flight plan. This flight plan has the departure and the destination as the same airport. Your route could include several other airports or waypoints you fly to during practice. This works best in quiet airspace and may create issues if the route is in busy areas (NYC, SoCal) where arrivals are routed differently than departures. In that case, it's better to file two (or more) flight plans.

Stay within one Approach facility's airspace. If you can stay within one facility's airspace, it reduces the amount of coordination necessary, and you can usually get any combination of approaches you want.

Check for preferred routes. This should be part of any IFR flight planning, but it's especially helpful if you find a Tower Enroute Control (TEC) route. These routes keep you within local approach facilities, which often facilitates negotiating approaches for practice along the way. Some flight planning apps show TEC routes, as does the FAA website under "preferred routes database." The route ID, in this case, SANN19, can be filed as the route in your flight plan. You could also get a route that was simply "SANN19" when you get your clearance. The FAA expects you to know how to decode the name into a complete route.

NFDC Preferred Routes Query Results

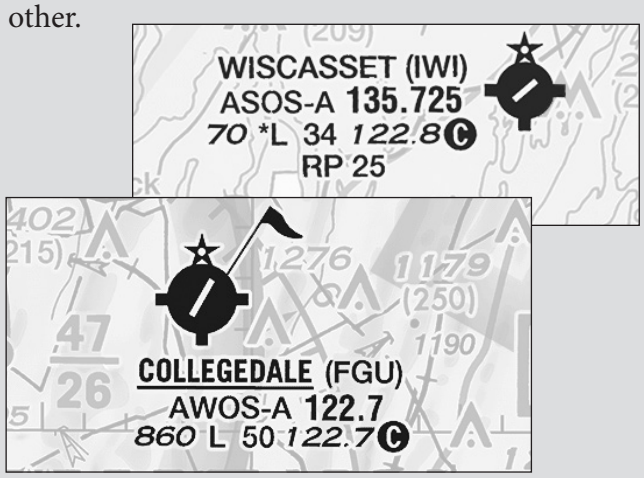
#	Orig	Dest	Rt Type	Num	Hour 1	Hour 2	Hour 3	Area	Aircraft	Altitude	Direction	Route String	DEPT ARTCC	ARR ARTCC
1	CRQ	CNO	TEC	5				SEE REMARK		PQ60	SANN19	CRQ OCN V23 DANAH V363 POXKU V8 PDZ CNO	ZLA	ZLA

TURNING ON THE AWOS TRANSMISSION YOURSELF

Some airports have pilot-controlled automated AWOS broadcasts. These are denoted with "AWOS-A" or "AWOS-AV" in the airport information on the Sectional Chart and the Chart Supplement. The AWOS-A can be on the CTAF, or on a discrete frequency.

In ether case, the pilot tunes that frequency and clicks the mic twice without speaking to play the report. It will play once, and then stop. Click the mic twice again if you missed some detail the first time through.

Occasionally, the system misinterprets aircraft calls to each other for a request and broadcasts a weather report right over pilots talking to each other.



Mission Field (KLVM)
Livingston, MT
ASOS 135.275 or 406-222-2338

AIRPORT MANAGER: 406-222-6504
WEATHER DATA SOURCES: ASOS 135.275 (406) 222–2338.
COMMUNICATIONS: CTAF/UNICOM 123.0 LIVINGSTON RCO 122.2
Radio)
Ⓡ BIG SKY APP/DEP CON 119.55 (1200–0615Z‡, other tim
Ⓡ SALT LAKE CENTER APP/DEP CON 119.55
AIRSPACE: CLASS E svc 1500–0100Z‡ other times CLASS

1 AUTOMATED VOICE OF ASOS
Mission Field, Livingston Montana, automated weather observation two three one six Zulu. Wind three zero zero at one five. Visibility one half. Rain. Sky condition: indefinite ceiling one hundred. Temperature one one Celsius. Dewpoint one one Celsius. Altimeter two niner niner six. Remarks, density altitude five thousand two hundred.

Information from an ASOS, or AWOS, at an airport is more than just helpful information for instrument pilots. The failure to receive the local altimeter setting can alter approach minimums, or even make the approach unavailable. Because you might be listening to the ASOS on one radio while simultaneously listening to ATC on the other, it's helpful to know the order of items. It may take several times through to get it all.

> [Airport/facility name], automated weather observation, [UTC time], [Wind direction/speed/gust], [Visibility], [Obstructions to vision], Sky condition: [Ceilings and obstructions to vis.], [Temperature], [Dewpoint], [Altimeter setting], [Density altitude advisory (if appropriate)], [Weather remarks and NOTAMs (if appropriate)].

While the METAR information you get via an ATIS broadcast (see next page) or a tablet app could be up to an hour old, the "one-minute weather" observations you'll hear when you tune an ASOS or AWOS station are updated—you guessed it—every sixty seconds.

That said, ASOS and AWOS stations tend to be a bit myopic compared to human observers. The "one-minute weather" is really a trend of observations over the past several minutes. When the digital voice you hear says "automated weather," use your head to interpret what you hear.

ASOS/AWOS transmissions are generally receivable within 25 NM of the airport, at or below 10,000 feet AGL. You can find the frequency in the airport data block on a Sectional Chart, and in an airport's Chart Supplement listing—along with a phone number if you want to listen to the current report before you head out to the plane. The Chart Supplement also specifies the type of ASOS/AWOS installed. See the Aeronautical Information Manual (AIM) for an explanation of what each type of system reports.

THE CAPABILITIES OF ASOS VERSUS AWOS

The most advanced ASOS systems report Runway Visual Range (RVR). This reports the visibility in feet rather than fractions of a mile, and is primarily for Part 135 (charter) and Part 121 (airline) use. There are some approaches that are approved for general aviation use down to RVR 1800 (with certain equipment), so this can affect your flying in some situations. No matter what, it gives you a more precise measurement of visibility for your departure or approach.

ASOS and AWOS systems vary on many other detection abilities. For example, many AWOS systems have limited, or no, ability to detect freezing precipitation. ASOS installations have a much more stringent specification than AWOS and are often (but not always) more capable.

Monitor ATIS

> 1 ATIS RECORDING
> Des Moines Airport Information X-ray, zero six five four Zulu. Wind three five zero at one one. Visibility six. Light rain, mist. Ceiling eight hundred broken, one thousand five hundred overcast. Temperature two three, dewpoint two zero. Altimeter three zero zero zero. ILS Runway Five approach in use. Departing Runway Three One. Advise on initial contact you have Information X-ray.

Whether you're departing a towered airport or arriving, you'll need the latest Automatic Terminal Information Service (ATIS) broadcast. It gives you the current weather, and critical IFR information such as the approach(es) in use. You may also hear about delays due to IFR flow control.

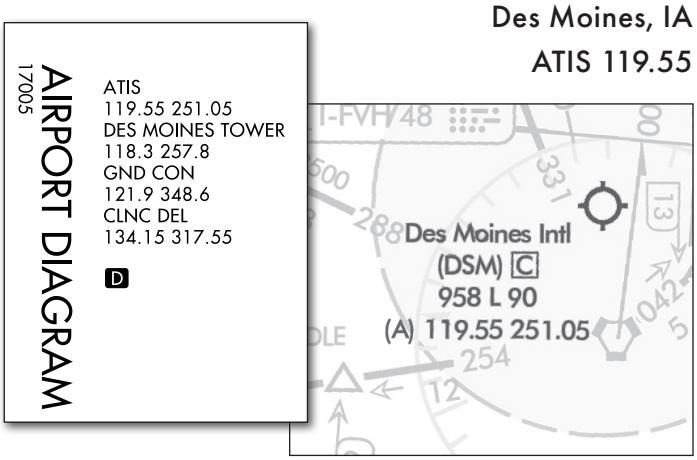
If you've listened to the ATIS, tell ATC by stating the phonetic letter code you heard ("... we have Information Charlie"). Reading the weather off your tablet and telling a controller "I have the numbers" doesn't cut it. There may be recent NOTAMs, or other info, only available via ATIS. Also, the letter code is a verification you have the ATIS from the correct airport.

An ATIS recording is updated hourly, or whenever there's a significant change in weather, the runway in use, or the instrument approach in use. Some airports have a digital ATIS (D-ATIS) that aircraft with datalink can receive as text. There's a synthesized voice for pilots using conventional radios.

TIP

Remember that the ATIS is updated hourly, usually about ten minutes before the hour, unless there has been a significant change to the weather. If you hear that this ATIS is a "special observation," then conditions such as wind, visibility, or sky conditions are changing significantly—and possibly rapidly. This should be a heads up for any instrument pilot. The altimeter setting might be almost an hour old, as well. If your altimeter disagrees with field elevation, that could be a factor.

Des Moines International Airport (KDSM)
Des Moines, IA
ATIS 119.55



No matter how it sounds, the format of an ATIS is always the same:

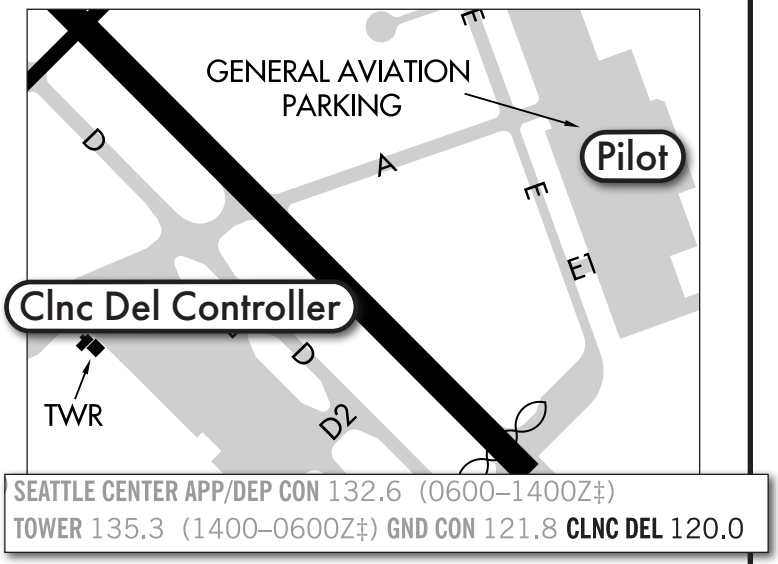
> [Airport/facility name], Information [Phonetic letter code}, [UTC time] observation. [Wind direction/speed/gust], [Visibility], [Obstructions to vision], [Sky condition], [Temperature], [Dewpoint], [Altimeter setting], [Density altitude advisory (if appropriate)], [Weather remarks], [Instrument approach in use], [Landing runway], [NOTAMs]. Advise on initial contact you have Information [Phonetic code].

When the visibility is three miles, or more, and the ceiling is at or above the highest initial approach altitude established for any low-altitude instrument approach procedure, the ATIS may say "visual approach in use Runway [number]," or it may simply say the runway number. A departure runway will only be provided if it's different from the landing runway. If the ceiling is above 5000 feet AGL with more than 5 miles visibility, the ceiling/sky condition, visibility, and obstructions to vision may be omitted as well.

An airport's ATIS frequency appears on the Sectional Chart, on the Airport Diagram, and on Departure/Arrival and Approach Procedure charts. Sometimes there's more than one frequency, and at really big airports there's often a separate ATIS for departures and arrivals. All the frequencies and phone numbers can be found in an airport's Chart Supplement listing, too.

Request an IFR Clearance at a Towered Airport (via Clearance Delivery)

Tri-Cities Airport (KPSC)
Pasco, WA
Clearance Delivery 120.0



Your IFR clearance is the gateway to IFR flight, and the simplest scenario is calling a dedicated Clearance Delivery frequency and getting a clearance that's exactly what you filed. You'll find the Clearance Delivery frequency in the "Communications" section of the Chart Supplement listing, or on the Airport Diagram.

About 30 minutes before your filed departure time, your flight strip slides out of a printer in the tower. Anytime thereafter, (but preferably close to the time you'll be ready to taxi) call Clearance Delivery with the format:

> [Facility name] Clearance, [Full call sign], IFR to [Destination]. Information [Phonetic code], Request clearance.

If the controller has your flight strip, he or she may start reading right away ②, or give you a moment to inhale first and prepare to write it down. If the controller doesn't have the flight strip you'll hear, "Clearance on request, standby." Then the controller will manually request it from the system.

The clearance will follow the standard "CRAFT" format: Clearance limit (destination), Route (direction), Altitude, Frequency (for Departure or Center), and Transponder (squawk code). If you're lucky, you'll hear "cleared as filed." If not, note the changes.

① PILOT
Tri-Cities Clearance, Cirrus Eight Eight Seven Two Bravo. IFR to Nampa. Information Mike. Request clearance.

② CLEARANCE DELIVERY CONTROLLER
Cirrus Eight Eight Seven Two Bravo, cleared to Nampa Municipal Airport as filed. Maintain five thousand, expect one one thousand one zero minutes after departure. Departure frequency one two eight point seven five. Squawk six two seven one.

③ PILOT
Cleared to Nampa as filed. Maintain five thousand, expect one one thousand one zero minutes after departure. Departure one two eight point seven five. Squawk six two seven one. Cirrus Eight Eight Seven Two Bravo.

④ CLEARANCE DELIVERY CONTROLLER
Cirrus Eight Eight Seven Two Bravo, readback correct. Contact Ground one two one point eight when ready to taxi.

⑤ PILOT
Cirrus Eight Eight Seven Two Bravo.

Read back the entire clearance ③. If the controller is confident you've written down the same clearance ATC expects you to fly, you'll hear "Readback correct." That's your cue that ATC and you are on the same page (well, flight strip), and that it's time to get flying to execute that plan.

TIP

Technically, "Request clearance" and the ATIS letter in call ① are unnecessary. You're calling Clearance Delivery, so they can guess you want a clearance for "IFR to Nampa." You'll also state the ATIS letter again when you contact Ground.

Request an IFR Clearance at a Towered Airport (via Ground)

① PILOT
Bolton Ground, Cirrus Eight Eight Seven Two Bravo at Columbus Jet with Mike, IFR to Kalamazoo. Request clearance.

After a brief pause while the controller locates your flight strip ...

② GROUND CONTROLLER
Cirrus Eight Eight Seven Two Bravo, cleared to the Kalamazoo Airport via climb runway heading, vectors DIPNE, then as filed. Maintain three thousand, expect eight thousand five minutes after departure. Departure frequency one three four point zero. Squawk three six two seven.

③ PILOT
Cleared to Kalamazoo via runway heading, vectors DIPNE, then as filed. Maintain three thousand, expect eight thousand five minutes after departure. Departure one three four point zero. Squawk three six two six. Cirrus Eight Eight Seven Two Bravo.

④ GROUND CONTROLLER
Cirrus Seven Two Bravo, squawk should be three six two *seven*, rest of readback correct. Advise when ready to taxi.

⑤ PILOT
Three six two seven. Got it. We're ready to taxi now. Cirrus Seven Two Bravo.

⑥ GROUND CONTROLLER
Seven Two Bravo, Runway Two Two, taxi via Bravo, Alpha.

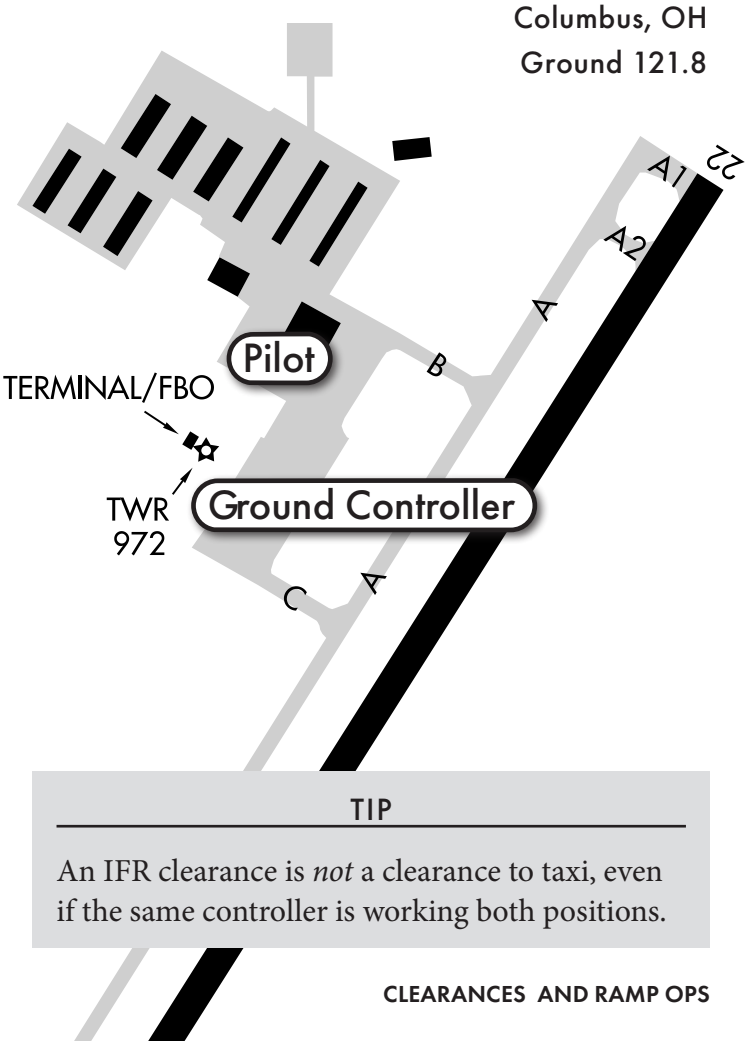
⑦ PILOT
Runway Two Two via Bravo, Alpha. Cirrus Seven Two Bravo.

While Class B and C airports have a dedicated Clearance Delivery frequency, most Class D airports don't, and you'll call Ground Control to request your IFR departure clearance. Always listen to the ATIS first, as sometimes it will specify who to call.

Because you're calling Ground, your initial call can include your location on the airport and ATIS letter. Essentially, it's both a request for your IFR clearance and the information Ground needs before letting you taxi, all in one statement. The controller may forget and ask for it again when it's time to taxi. Because you're already talking to Ground, you can request your taxi without changing frequencies ⑤.

Alternately, you can make a clearance request of Ground just like with Clearance Delivery, and then separately give them your location and ATIS letter when you request taxi. In this case, call ① would be: "Bolton Ground, Cirrus Eight Eight Seven Two Bravo. IFR to Kalamazoo. Request clearance." When you called for taxi it would be as described on page 24.

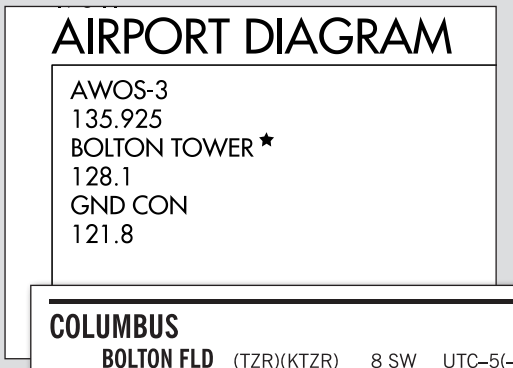
Bolton Field Airport (KTZR)
Columbus, OH
Ground 121.8

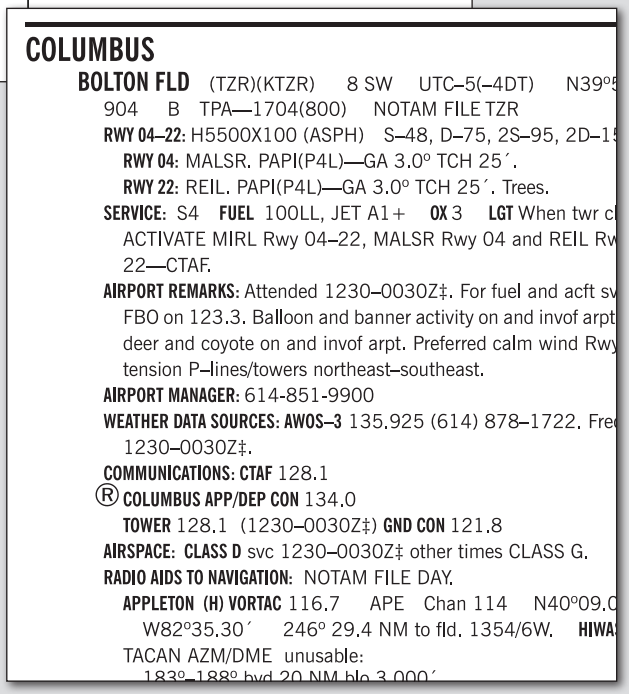


TIP

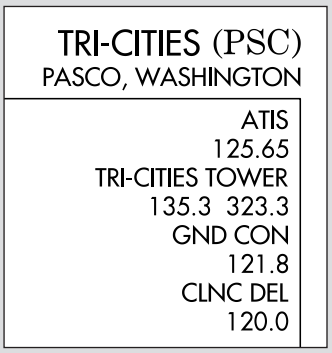
An IFR clearance is *not* a clearance to taxi, even if the same controller is working both positions.

FREQUENCIES ON CHARTS VERSUS CHART SUPPLEMENT





Charts for instrument flight show the frequencies relevant for that phase of flight. The airport diagram for Bolton includes the AWOS, Tower, and Ground. These are the frequencies you'd need on the airport surface. If Bolton had an ATIS broadcast, or a dedicated Clearance Delivery frequency, those would appear on the airport diagram, as they do for Tri-Cities Airport. An approach chart would have ATIS/AWOS, the Approach or Center frequency overseeing that approach, Tower, and Ground.



The Chart Supplement has all the frequencies for that airport, as well as additional information about those communications. For example, the star by Bolton Tower on the airport diagram means the tower is part time. The Chart Supplement shows what those hours are, as well as what the Class D airspace reverts to when the tower closes. It also lists phone numbers for ATIS or ASOS/AWOS, which come in handy before flight.

"CRAFT" STRUCTURE FOR CLEARANCES

IFR clearances follow a set structure that can be summed up with the acronym "CRAFT."

Clearance limit. This is almost always the destination airport, but could be a fix.

Route. It's how you'll get from where you are to where you want to go. The simplest route you'll hear is "as filed." The opposite is a sadistic, computer-generated routing that takes you through three states you don't have charts for.

Altitude. This is the altitude you will climb to and level off. It might be what you filed, or not. It can be re-negotiated later.

Frequency for Departure or Center. You'll need to contact someone after takeoff, and you'll use this frequency to do it.

Transponder code. It's your squawk code, which is always the last part of your clearance.

CLEARANCE CORRECTIONS

The simplest clearance you can get is "as filed." This is great because there's no route to figure out; you got what you asked for. The other extreme is a full route clearance where the only thing remaining from your filed route is the destination (page 20).

In between that, you might hear "... as filed, except change [navaid or airway] to read [different navaid or airway]." Sometimes this is just a naming difference where one path through the sky goes by two different names. You might get a clearance where a whole section changes, such as: "cleared to the Bigtown Airport via [new first part of route that joins the filed route], then as filed."

This is why you should have your filed route for reference when you call for your clearance.

Request an IFR Clearance at a Towered Airport (with Departure Procedure)

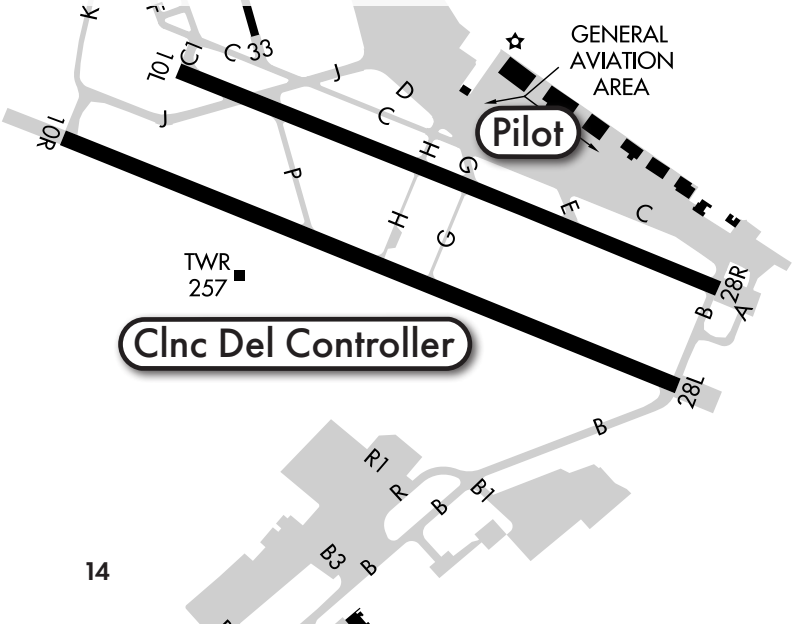
① PILOT
Oakland Clearance, Cirrus Eight Eight Seven Two Bravo. IFR to Nevada County, information Mike.

② CLEARANCE DELIVERY CONTROLLER
Cirrus Eight Eight Seven Two Bravo is cleared to Nevada County Airport via the Nimitz Five departure, radar vectors to Victor Six, Sacramento VOR, direct. Maintain four thousand, expect seven thousand one zero minutes after departure. Squawk four five two two.

③ PILOT
Cleared to Nevada County via the Nimitz Five departure, radar vectors to Victor Six, Sacramento VOR, direct. Maintain four thousand, expect seven thousand one zero minutes after departure. Squawk four five two two. Cirrus Eight Eight Seven Two Bravo.

④ CLEARANCE DELIVERY CONTROLLER
Cirrus Seven Two Bravo, readback correct. Contact Ground point niner when ready to taxi.

Metropolitan Oakland Intl. Airport (KOAK)
Oakland, CA
Clearance Delivery 121.1



The most common addition to an IFR flight plan you filed is a standard instrument departure procedure (SID). These can save time because published items don't need to be spoken in the clearance. In this case, there's no heading for flight after departure and no frequency for the Departure controller ② because the SID (opposite page) includes instructions to fly heading 315 and that NorCal Departure is on 127.0.

The NIMITZ FIVE is pretty simple: You fly a heading until getting vectors. Some departures are quite complex, and you navigate via headings, radials, navaids, or waypoints all the way to a specific fix (see the SAN JOSE TWO page 16). Some combine vectors with pilot navigation and may have altitude or speed restrictions for the pilot nav sections (see the NUEVO EIGHT page 19). Some have a common start but multiple exit points, called transitions (page 16).

No matter which kind of departure you're assigned, the routing part of a clearance with a SID always follows the same format:

> Cleared to [Destination] airport via [SID name and number], [Transition name (if applicable)], [Additional instructions (if needed)] ... [the rest of the route] ... maintain [Altitude], [the remaining clearance].

You may include a departure procedure in your flight plan, but even if you don't, you may be assigned one. Even if you file the SID and get that route, the clearance will contain the name of the SID and then "as filed." This way there's no confusion. If you don't want to be assigned a SID, just write "No SID" in the Remarks section when you file.

SIDs also keep you clear of obstacles. However, it's up to you to ensure you have the required climb gradient, which is 375 feet per NM on the NIMITZ FIVE when departing certain runways. You must

TIP

Ground frequencies are almost always on a frequency of 121.x. When you hear, "Contact Ground point niner," it means 121.9.

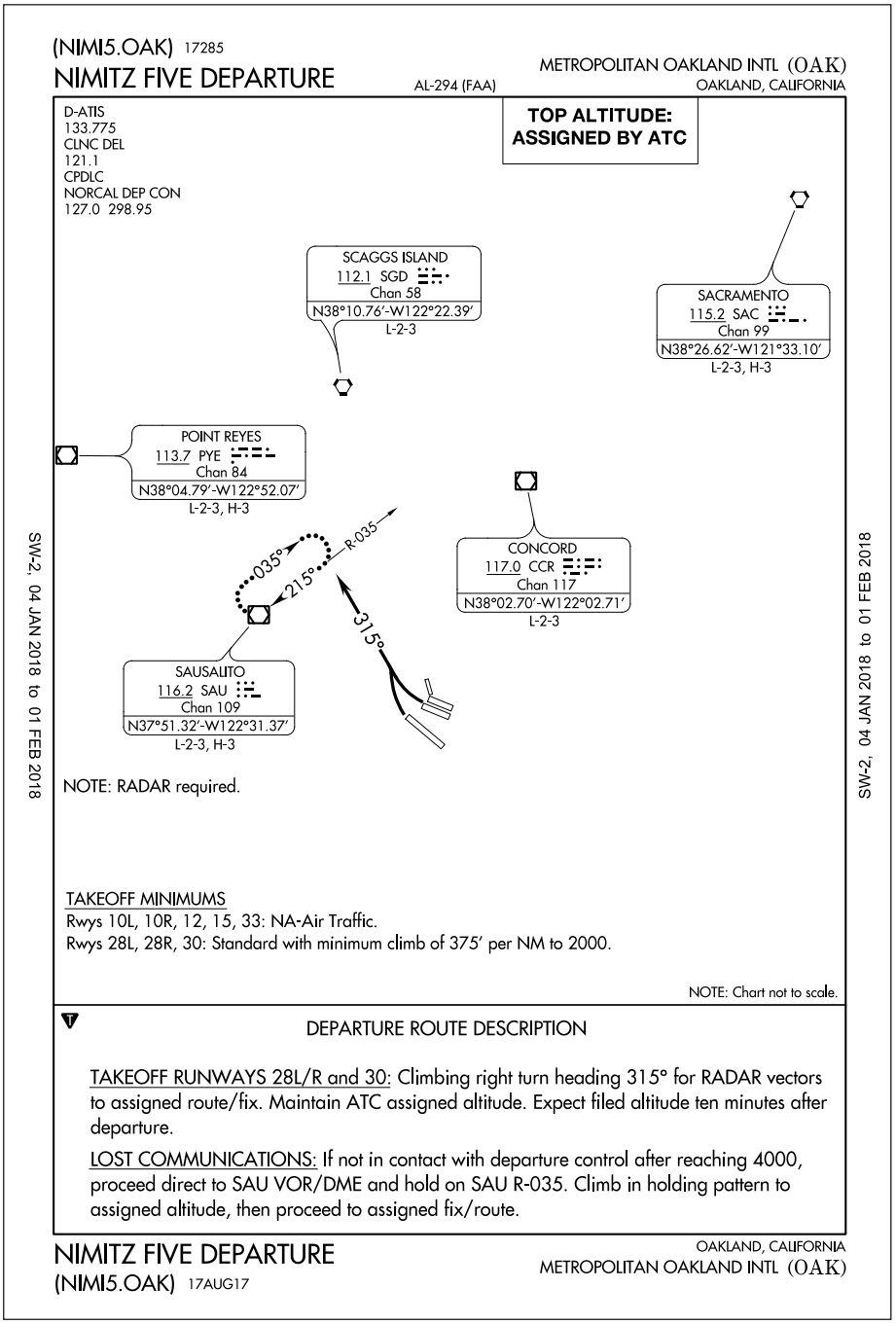
TIP

If ATC doesn't assign a departure or provide other instructions on getting from the airport to your first waypoint, you are responsible for obstacle clearance on that climb until you receive a vector. Be sure you have a plan.

have at least a textual copy of the SID with you in order to accept it as part of your clearance.

There also may be charted Obstacle Departure Procedures (ODPs) that are solely for obstacle clearance, but the phraseology is the same as SIDs. It's unusual, but you can get assigned a textual departure procedure (no graphical chart) strictly for obstacle clearance, in which case the phraseology is different (see below).

Study with care any SID or ODP that's in your clearance, since that's exactly what ATC expects you to do. SIDs and ODPs can be found in printed approach chart books, in tablet apps, and in the FAA's Digital Terminal Procedures Publication (d-TPP).



PHRASEOLOGY: AN ASSIGNED SID VERSUS ASSIGNED ODP

While it's permissible to file a departure procedure with your IFR flight plan, it's more common to file without it and let ATC add the departure in use when you actually depart. Some departure procedures are runway dependent, and that can be tough to know the night before you leave.

Whether you file it, or it gets added to your flight plan, the clearance will include the departure name, "Cleared to Lompac airport via the CREPE THREE departure, Morro Bay transition, then as filed." You should review the chart and ensure you understand the procedure, and how it connects with your filed route. That's critical if you lose comms and have a time limit for action.

It's rare to have a textual ODP assigned by ATC, but if they do it will sound like, "Cleared to the Oceanside airport via the Runway 26R departure procedure, then as filed." In this case, review the textual departure procedure and how it connects to your filed route.

Request an IFR Clearance at a Towered Airport (with SID and Transition)

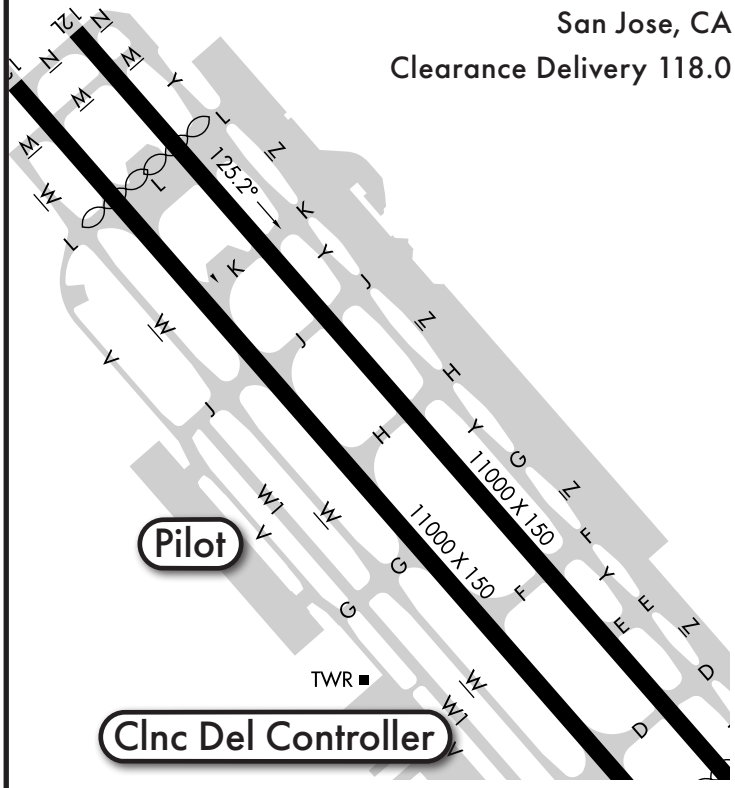
① PILOT
San Jose Clearance, Cirrus Eight Eight Seven Two Bravo. IFR to Fresno Yosemite.

② CLEARANCE DELIVERY CONTROLLER
Cirrus Eight Eight Seven Two Bravo is cleared to Fresno Yosemite Airport, San Jose Two departure, Panoche transition, Clovis, direct. Maintain five thousand. Squawk six six five two.

③ PILOT
Cleared to Fresno Yosemite Airport, San Jose Two departure, Panoche transition, Clovis, direct. Maintain five thousand. Squawk six six five two. Cirrus Eight Eight Seven Two Bravo.

④ CLEARANCE DELIVERY CONTROLLER
Cirrus Seven Two Bravo, readback correct. Contact Ground point niner when ready to taxi.

Norman Y. Mineta San Jose Intl. Airport (KSJC)
San Jose, CA
Clearance Delivery 118.0



It's critical to review any charted departure in detail, because you're responsible for meeting all the demands it imposes. These could be frequencies used, departure runways, route, identification of fixes, climb rate, crossing restrictions, or more (see "SID Terminology" on page 17). Those details became part of your clearance with the departure.

In the case of the SAN JOSE TWO, you know when departing Runway 30L or 30R, your departure frequency is 121.3, you must climb on heading 306 to reach 1.8 NM DME from SJC before turning heading 113 to join OAK R-121and fly to MOONY. There's also a required climb gradient to 4000 feet.

Because you were assigned the Panoche transition, after MOONY, you'll track R-288 to PXN on a course of 108. From PXM, you'll proceed direct to Clovis VOR, which is also on V230, and then to the destination airport. You don't need ATC's vectoring for any of it. That's why the SAN JOSE TWO is considered a pilot nav SID. Entirely "pilot nav" SIDs, such as the SAN JOSE TWO, have no lost comm procedure. Without vectors, there's no need for one.

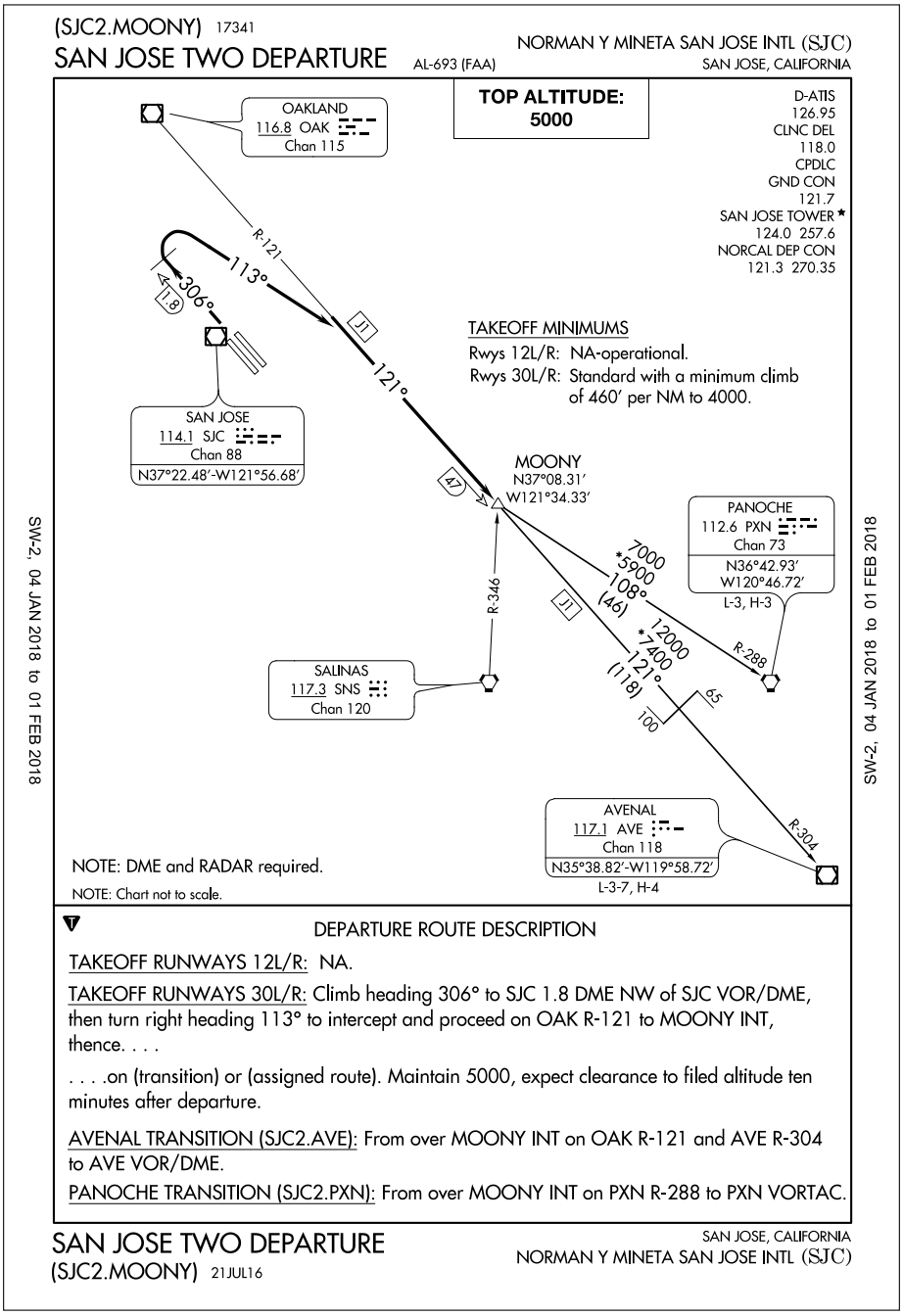
Transitions are an integral part of many SIDs, and have a special way of being written that you may see in text, on the web, or on tablet planning apps. Written out, this clearance would be KSJC SJC2.PXN CZQ KFAT. The "SJC2.PXN" is SAN JOSE TWO with the PXN transition. The other charted transition is via Avenal VOR and would be "SJC.AVE." You'll see this terminology at the bottom of the SID chart.

This SID has a published top altitude of 5000 feet and that's what you were told to maintain. There are no crossing restrictions, so it's an unrestricted climb to 5000 feet. Had the controller assigned 3000 or 7000 feet, you would climb without stopping up to the assigned altitude.

If you're wondering why ATC tells you to maintain 5000 when it's published on the chart, see "'Climb Via' in a Clearance isn't Supposed to be a Heads Up, But it Is" on page 19.

TIP

The altitudes published along the transition routes are MEAs for planning purposes, or lost com. You must maintain 5000 until told to climb.



SID TERMINOLOGY

Transition could reference different published routes branching out from a common starting point, such as MOONY. A transition could also reference a waypoint the aircraft will be vectored to before continuing on course.

Top Altitude is the highest altitude the pilot is cleared to as part of the departure clearance. This might be published on the chart, or it might be assigned by ATC, or both (as in this case). An ATC-assigned top altitude always supercedes a published one.

A **Crossing Restriction** is an altitude you must be below, above, or exactly at when passing a certain waypoint (page 19).

A **Speed Restriction** is a speed to stay below until a specific waypoint. (It's rarely an issue when flying piston-powered equipment.)

CLEARANCE ON REQUEST

If you get a "clearance on request" from a clearance delivery controller at a Class C airport, it simply means the controller doesn't have your flight strip available yet. You can either sit tight and wait, or you can ask to contact Ground for taxi.

This is usually no problem, but when Clearance Delivery and Ground are the same controller, that controller will even ask if you're ready to taxi while your clearance is on request. At some point during your taxi, you should hear, "Seven Two Bravo, I have your clearance. Advise ready to copy."

Don't try to copy a clearance while taxiing. Tell the controller you'll be ready when you reach the runup area. Or, find a spot to pull out of the way to stop and focus on copying the clearance.

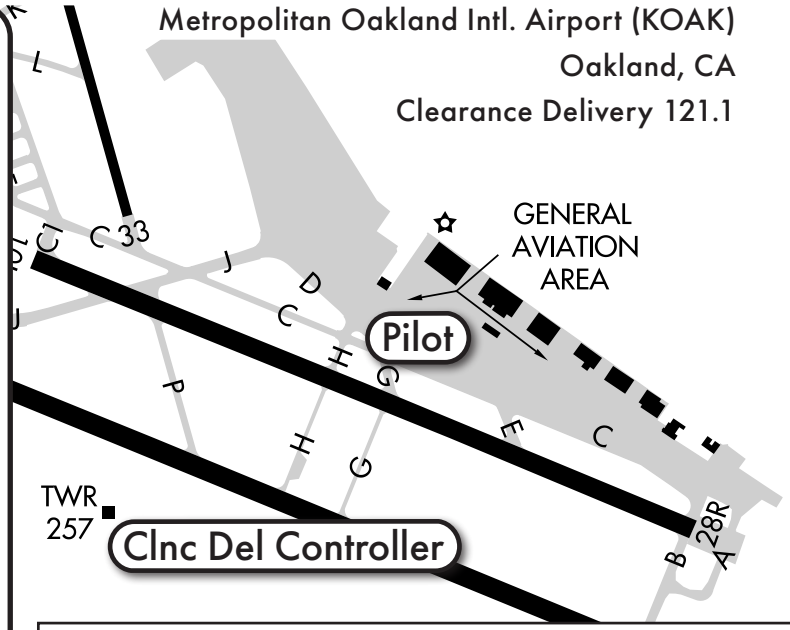
Request an IFR Clearance at a Towered Airport (with "Climb Via")

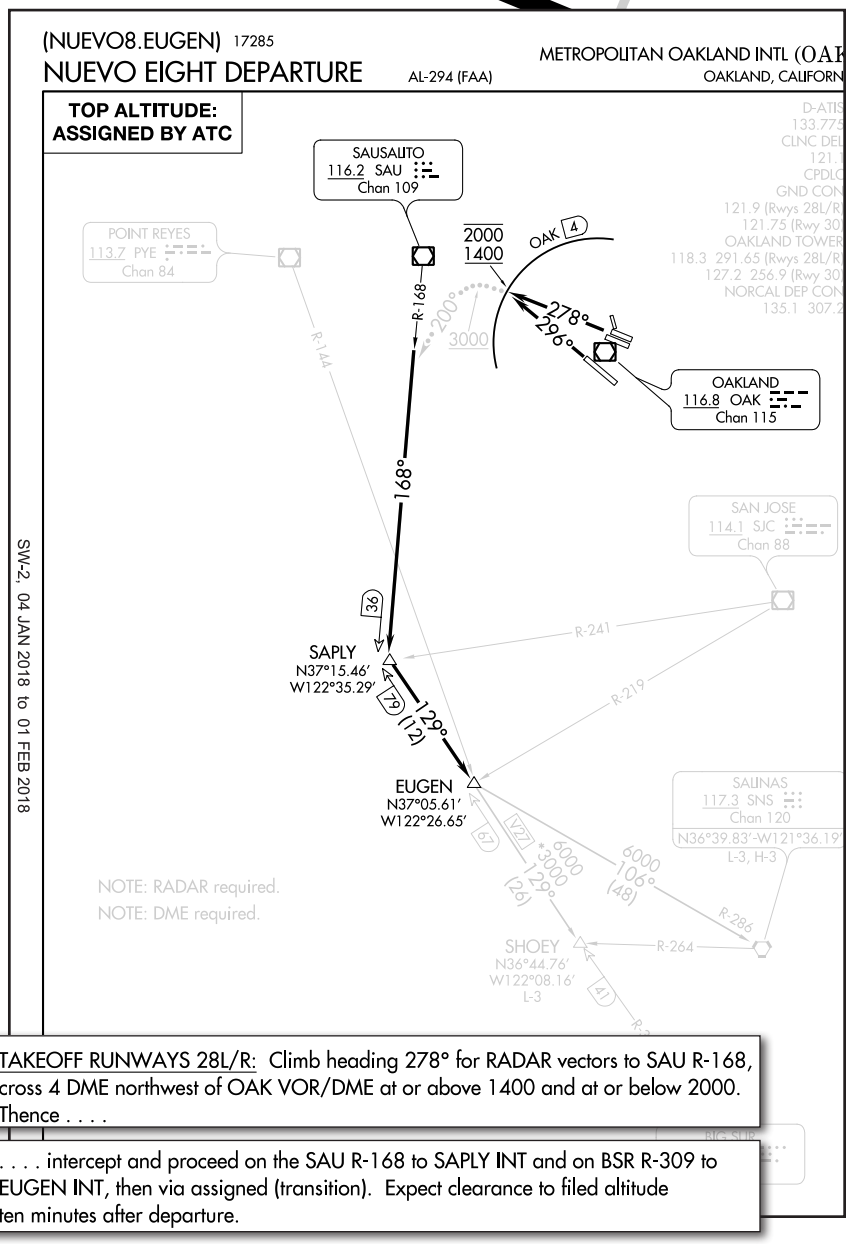
① PILOT
Oakland Clearance, Cirrus Eight Eight Seven Two Bravo. IFR to Watsonville.

② CLEARANCE DELIVERY CONTROLLER
Cirrus Eight Eight Seven Two Bravo is cleared to Watsonville Airport, Nuevo Eight Departure, direct. Climb via SID, except maintain four thousand. Squawk six six seven one.

③ PILOT
Cleared to the Watsonville Airport, Nuevo Eight Departure, direct. Climb via SID, except maintain four thousand. Squawk six six seven one.

④ CLEARANCE DELIVERY CONTROLLER
Cirrus Seven Two Bravo, readback correct. Contact Ground point niner when ready to taxi.





The words "climb via" in a clearance strike fear into the hearts of many IFR pilots. That's only partly unfounded, because "climb via" is ATC's way of saying, "however this gets screwed up, it's your fault."

Here's a tip: The first use of the SID in your clearance—"cleared to [airport], [SID name] Departure ..."—is your lateral path, a.k.a. your route, including any of the published turns and segments. When ATC adds, "climb via SID," that's your assigned altitude, including any intermediate altitude or speed restrictions. If you departed Runway 28R with "climb via SID," you must fly a heading of 278 and reach 4 DME from OAK at an altitude between 1400 and 2000 feet. Then continue climbing to the assigned top altitude while turning to intercept R-168 from SAU. Then proceed to SAPLY, and then on to EUGEN. No transition was assigned, so from EUGEN it's direct Watsonville.

There's no published top altitude, so ATC must assign one. The controller wants the altitude restriction at 4 DME OAK to remain in effect, so the words, "except maintain" only change the top altitude. See "'Climb Via' in a Clearance isn't Supposed to be a Heads Up, But it Is" on page 19 for more details.

"CLIMB VIA" IN A CLEARANCE ISN'T SUPPOSED TO BE A HEADS UP, BUT IT IS

It used to be that controllers would add "climb via SID" into a departure clearance to emphasize crossing restrictions in the SID—and help ensure pilots didn't miss those required turns, speeds, or altitudes. The FAA has issued guidance that this is "inappropriate use of this phraseology."

Functionally, however, that's still what happens. There are three ways you could hear a charted departure procedure included in your clearance, and if you hear "climb via," there is a crossing restriction you should look for.

The simplest case is number one (upper right). There are either no crossing restrictions, or there's a vector before any crossing restrictions occur, so ATC will step in before you worry about it. The NIMITZ FIVE (page 15) is an example, as is the RENTN THREE (page 31). Your cleared route starts with the SID, and you're told to maintain an altitude. Even if the clearance delivery controller is just restating the published top altitude, you'll still be told, "maintain [altitude]." Yes, that's redundant. Yes, the system is a bit broken.

If there are any crossing restrictions you'll meet before ATC steps in with a vector, which include pilot nav SIDs that have no vectors at all, you will hear the SID name in your clearance for your route, and you'll hear "climb via SID" (case two) or "climb via SID, except maintain" (case three) for your altitude.

If there's also no amendment to the published top altitude, then it's case two and you just hear "climb via SID" as an altitude assignment. If the NUEVO EIGHT (page 18) had a published top altitude, then it could fall into this category. "Climb via SID" would be the only altitude assignment you receive because the altitude was published and ATC didn't want it changed.

The SAN JOSE TWO (page 17) could fall into this category if the change of heading from 306 to 113 happened at a specified altitude rather than a specified distance.

Case three only differs from case two with the assignment of an altitude, but the wording is critical. When a clearance contains, "Climb via SID, except maintain [altitude]" the only thing affected is the top altitude. All published crossing restrictions below that altitude remain in effect. In the case of the NUEVO EIGHT, that means you cross 4 DME from OAK between 1400 and 2200 feet and then climb to the top altitude assigned by ATC.

1. No crossing restrictions, or crossing restrictions happen after a radar vector segment:

   "Cleared to [destination], [SID name] departure ... Maintain [altitude] ..."

2. Crossing restrictions before any radar vectors, no changes to published altitude:

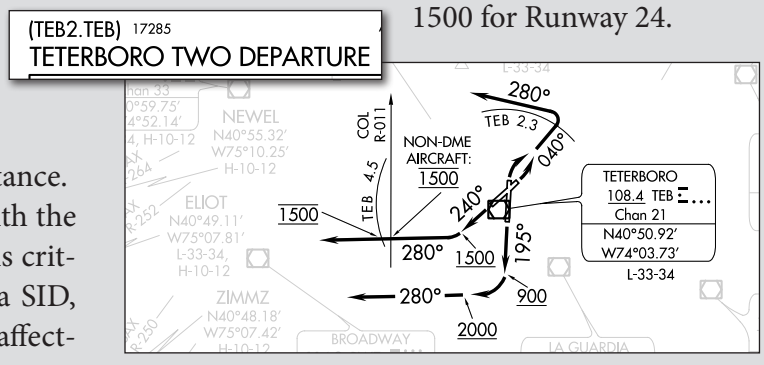
   "Cleared to [destination], [SID name] departure ... Climb via SID ..."

3. Crossing restrictions before any radar vectors, amended or assigned altitude:

   "Cleared to [destination], [SID name] departure ... Climb via SID, except maintain [altitude] ..."

Had the clearance said, "maintain [altitude]" instead of "except maintain [altitude]" all crossing restrictions below the assigned top altitude are canceled. (Speed restrictions are still in effect.) You climb unrestricted to the assigned top altitude. Such a clearance would be highly irregular, so you would verify it with ATC.

This occasionally makes for some interesting phraseology departing different runways on the same SID. Departing northeast on the TETERBORO TWO, you'll hear a clearance with the SID name and "maintain altitude." There's no crossing restriction, only a distance to travel before turning. Departing southwest you'll hear "Climb via SID," not because of the turns at 900 or 1500 feet, but for the restrictions of 2000 for Runway 19 and exactly 1500 for Runway 24.



Request an IFR Clearance at a Towered Airport (with Full Route Clearance)

① PILOT
Coldwell Clearance, Cirrus Eight Eight Seven Two Bravo. IFR to Allentown.

② CLEARANCE DELIVERY CONTROLLER
Cirrus Eight Eight Seven Two Bravo, I have a full route clearance for you. Advise when ready to copy.

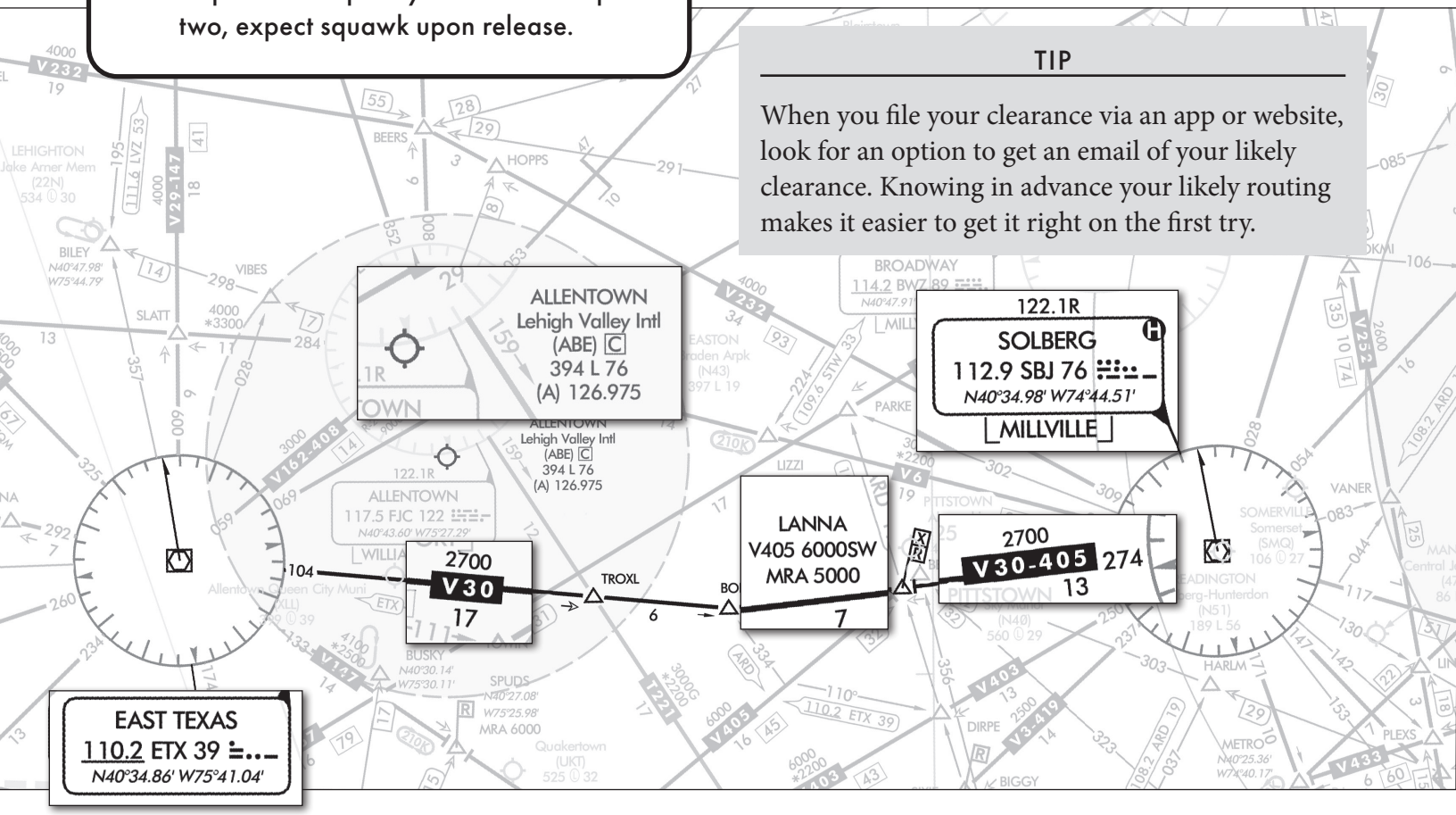
③ PILOT
Ready to copy, Cirrus Eight Eight Seven Two Bravo.

④ CLEARANCE DELIVERY CONTROLLER
Cirrus Eight Eight Seven Two Bravo cleared to Allentown Airport via after departure turn left heading one eight zero, expect radar vectors Sierra Bravo Juliet, Victor Thirty, LANNA intersection, Victor Thirty, East Texas, direct. Maintain two thousand, expect six thousand one zero minutes after departure. New York Departure frequency one one niner point two, expect squawk upon release.

After frantic scribbling and head scratching ...

⑤ PILOT
Ah ... can you please speak slower, and spell out all the navaids and waypoints? And was Victor Thirty in there twice?

⑥ CLEARANCE DELIVERY CONTROLLER
Sure, no problem. Yeah, the preferred routing has Victor Thirty in there twice. Pretty redundant but it's the way the computer pops it out. The route is after departure turn left heading one eight zero. Expect radar vectors Sierra Bravo Juliet VOR, Victor Thirty, Lima Alpha November November Alpha intersection, Victor Thirty, Echo Tango X-Ray VOR, direct. Maintain two thousand, expect six thousand one zero minutes after departure. New York Departure frequency one one niner point two, expect squawk upon release.



TIP

When you file your clearance via an app or website, look for an option to get an email of your likely clearance. Knowing in advance your likely routing makes it easier to get it right on the first try.

The words, "I have a full route clearance for you," are dreaded by instrument pilots of all levels. Pull out your pen (or tablet) and get ready to write something long and probably completely different from what you filed. This is why you get your clearance before you dial all the waypoints into your GPS.

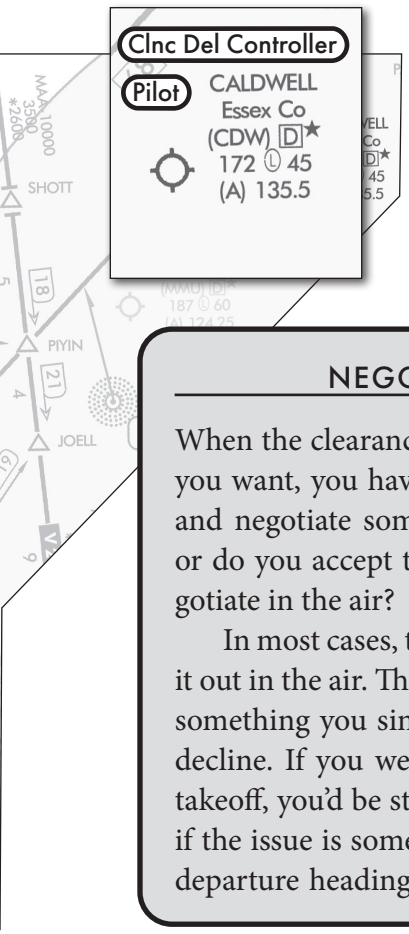
Feel free to ask for clarifications, the spelling of VORs or waypoints, or even another read done more slowly ⑤. Neither you nor the clearance delivery controller should be in a rush. The goal of this clearance process is that you and ATC are in complete agreement as to your cleared route. It may change as you fly, but if you were to lose communication in the clouds, this route becomes ATC's primary way of knowing where you are and where you're going. If you're using a GPS or tablet, zoom out to review the whole route to ensure it looks right, and there are no surprises when you fly it.

You can also request a full route clearance. If you amended your flight plan after you filed it, hearing "Cleared as filed" wouldn't reveal if you and ATC were actually looking at the same thing.

⑦ PILOT
Okay, thanks. Cleared to Allentown via after departure turn left heading one eight zero. Expect radar vectors Sierra Bravo Juliet, Victor Thirty, Lima Alpha November November Alpha, Victor Thirty, Echo Tango X-Ray, direct. Maintain two thousand, expect six thousand one zero minutes after departure. Departure one one niner point two, squawk upon release.

⑧ CLEARANCE DELIVERY CONTROLLER
Cirrus Eight Eight Seven Two Bravo, readback correct. Sorry about that. Information Zulu is current, call Ground when ready for taxi.

⑨ PILOT
Will do. Thanks for the help.



Essex County Airport (KCDW)
Caldwell, NJ
Clearance Delivery 121.1

TIP

"Squawk on release" at the end of a clearance means you'll receive your squawk code from Ground or Tower once you're released for departure into their airspace. See "The Difference Between a Clearance and a Release" on page 28.

NEGOTIATING ROUTING BEFORE TAKEOFF VERSUS AFTER TAKEOFF

When the clearance you receive isn't the clearance you want, you have a choice to make: Do you try and negotiate something different before takeoff, or do you accept the clearance for now and renegotiate in the air?

In most cases, the best choice is to try and work it out in the air. There are exceptions. If the route is something you simply cannot fly safely, you must decline. If you were to lose communication after takeoff, you'd be stuck with that routing. Likewise, if the issue is something right after takeoff—like a departure heading that brings you uncomfortably close to a thunderstorm—it's best to get something different before you launch, if you can.

For most other items, though, you'll have better luck getting going and working it out in flight. IFR routing is always subject to change by you or ATC. In fact, it's a minority of IFR flights that don't have some changes off that original cleared plan, even if it's just an early direct to your destination. Just like you can deviate around weather (page 64), ask for blocks of altitude (page 58), or change your destination (page 69), you can ask for changes to your clearance as you go.

IFR CLEARANCE FLOW CHART

The structure of a departure clearance you receive on the ground is fairly consistent, however the details vary depending on where you're departing from.

Aircraft on the Ground		
Class B/C/D Airport	Class E Surface Area	Class G
Specify direction of takeoff, turn, or initial heading consistent with published DP or DVA.	Specify initial heading. Verify assigned heading complies with local traffic.	Tell aircraft to enter controlled airspace heading [heading number].

If there's a tower, your departure clearance will include a direction of departure that could be a heading, turn to make, or departure procedure. Turns would be made passing 400 feet AGL unless otherwise specified. That heading could be driven by local procedures, including standing agreements to avoid conflicts with traffic in and out of other airports.

Departing a Class E surface area, you'd be given a heading to fly that prevents conflicts with other traffic. Class E surface areas mean controlled airspace goes down to the surface, so ATC can issue instructions starting as soon as your wheels leave the pavement.

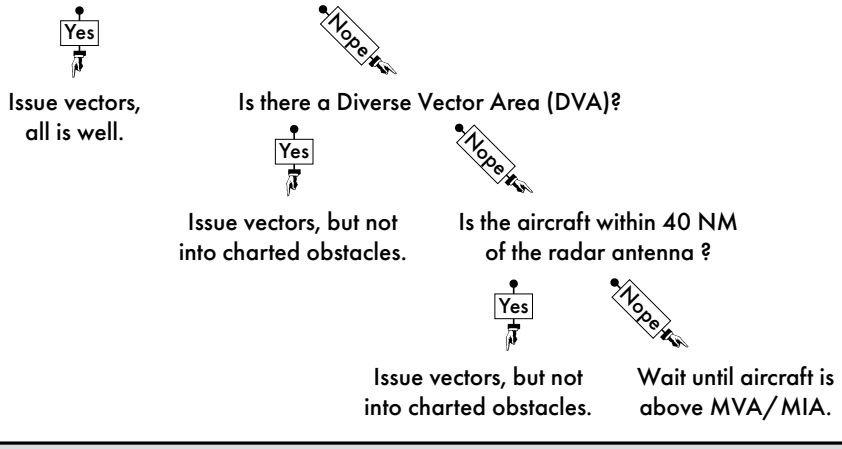
Class E surface areas aren't that common. They appear on Sectional Charts as magenta dashed areas around non-towered airports. Some Class D areas of towered airports revert to Class E surface areas after the tower closes as well.

Most non-towered airports are Class G at the surface. Controlled airspace could start anywhere from 700 feet above the surface up to 14,500 feet above the surface. In this case, your clearance should include a heading to be flying once you enter controlled airspace. How you get to that point is up to you. Note that in both the latter cases, you are still responsible for your terrain and obstacle clearance until ATC actually issues a vector.

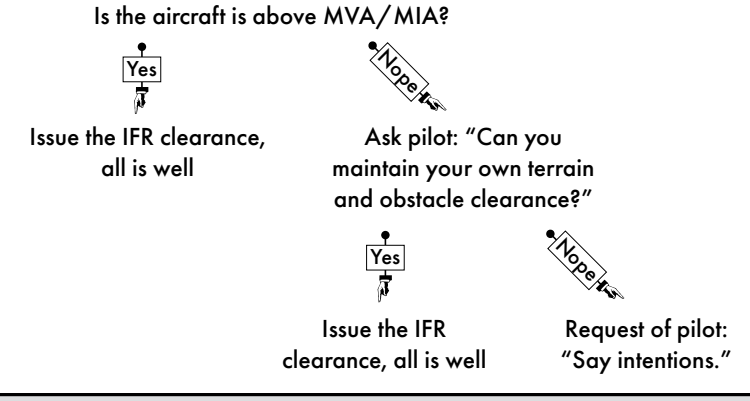
When you contact ATC airborne, they must check a few items before issuing you vectors (page 30 and page 47) that might shortcut your path on course. You must be above their minimum altitude for vectors (MVA/MIA) or in an airport area surveyed for obstacles and approved for departure vectors (DVA). If you're more than about 40 NM from the radar, vectors may be limited by an increased required distance between aircraft.

While we're at it, you can also request your IFR clearance after takeoff. ATC's decision tree is to the left. See page 54 for the ensuing conversation.

IFR, Airborne, in Radar Contact, and Seeking Vectors



VFR, Airborne, in Radar Contact, and asking for an IFR Clearance



① PILOT
Groton Clearance, Cirrus Eight Eight Seven Two Bravo, IFR to Nantucket.

② CLEARANCE DELIVERY CONTROLLER
Cirrus Eight Eight Seven Two Bravo cleared to the Nantucket Airport via Sandy Point, Tango Two Sixteen, NEWBE. Newbe Three Arrival. Maintain niner thousand. Providence Departure frequency one two five point seven five. Squawk three six two four.

③ PILOT
We're unable Tango Two Sixteen and Newbe Three. That's too far overwater for us. Any chance for Victor Three Seventy-Four via Martha's Vineyard?

④ CLEARANCE DELIVERY CONTROLLER
Cirrus Seven Two Bravo, uh, standby.

After some time waiting in suspense ...

⑤ CLEARANCE DELIVERY CONTROLLER
Cirrus Eight Eight Seven Two Bravo, amend route of flight to Groton, Victor Three Seven Four, Martha's Vineyard, Nantucket, direct.

⑥ PILOT
OK. Cleared to Nantucket via Groton, Victor Three Seven Four, Martha's Vineyard, Nantucket, direct. Maintain niner thousand. Departure on one two five point seven five. Squawk three six two four. Seven Two Bravo.

⑦ CLEARANCE DELIVERY CONTROLLER
Cirrus Seven Two Bravo, readback correct. Contact Ground one two one point six five when ready to taxi.

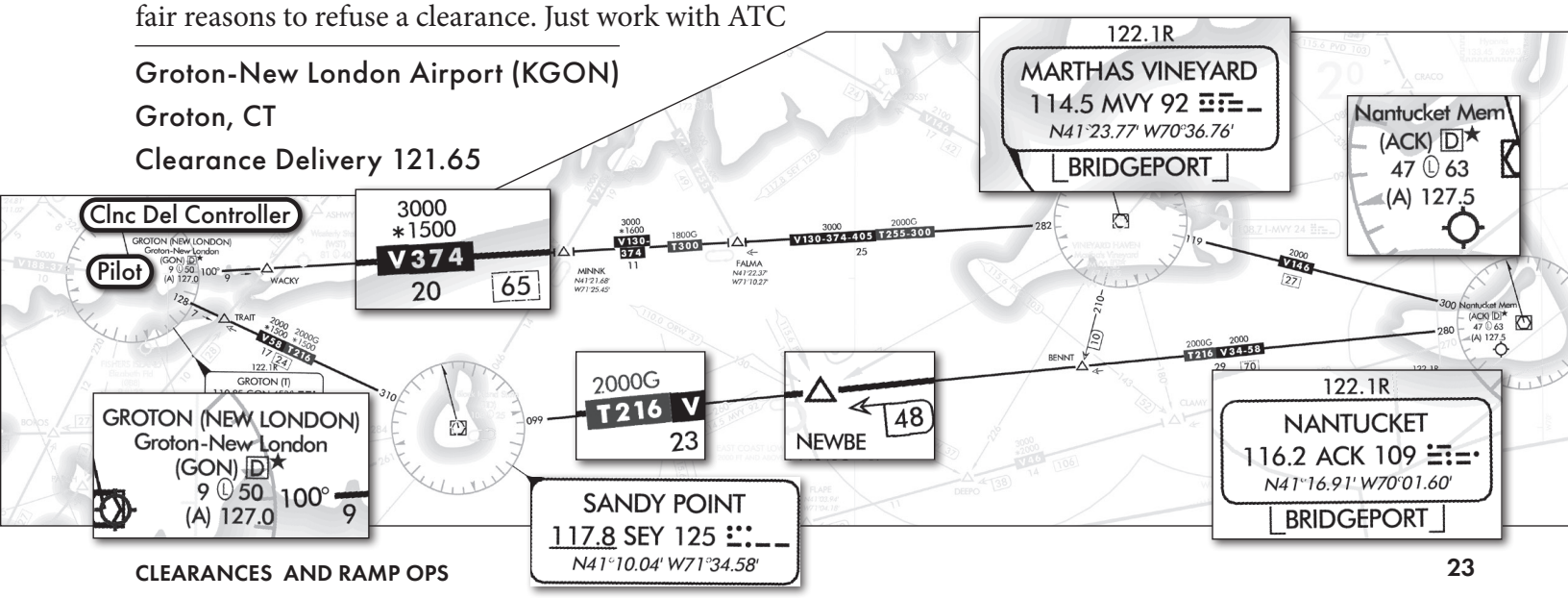
⑧ PILOT
Ground point six five. Thanks for the flexibility. Cirrus Seven Two Bravo.

The Pilot in Command is the final authority on operating the aircraft, not ATC. If you receive an IFR clearance you're not capable of flying—or are not willing to fly—it's time to negotiate.

ATC's algorithms assess your filed route against preferred routings, current traffic, and other factors. Changing what pops out of that computer might be as simple as the controller entering a change. It's more likely the controller will have to lobby on your behalf.

Avoiding bad weather, icing conditions, or overflying large expanses of inhospitable terrain are all fair reasons to refuse a clearance. Just work with ATC to find a solution, knowing you may have to trade off convenience or timeliness.

Groton-New London Airport (KGON)
Groton, CT
Clearance Delivery 121.65



Request Taxi to Runway for IFR Departure

① PILOT
Monterey Ground, Cirrus Eight Eight Seven Two Bravo. North hangars with Information Charlie. IFR.

② GROUND CONTROLLER
Cirrus Eight Eight Seven Two Bravo, Monterey Ground. Runway One Zero Right, taxi via Echo, Bravo.

③ PILOT
Runway One Zero Right, taxi via Echo, Bravo. Cirrus Eight Eight Seven Two Bravo.

④ GROUND CONTROLLER
Cirrus Seven Two Bravo, hold short of Runway One Zero Right ILS Critical Area.

⑤ PILOT
Hold short of Runway One Zero Right ILS Critical Area. Cirrus Seven Two Bravo.

After a jet touches down on Runway 10R:

⑥ GROUND CONTROLLER
Cirrus Seven Two Bravo, continue taxi.

⑦ PILOT
Continue. Cirrus Seven Two Bravo.

When you contact ground to request taxi at a towered airport, the controllers already know your departure direction and altitude. Therefore the only departure information you need to include is "... IFR." If the same controller is working both Clearance and Ground, they just read your departure information to you. The format for calling Ground is:

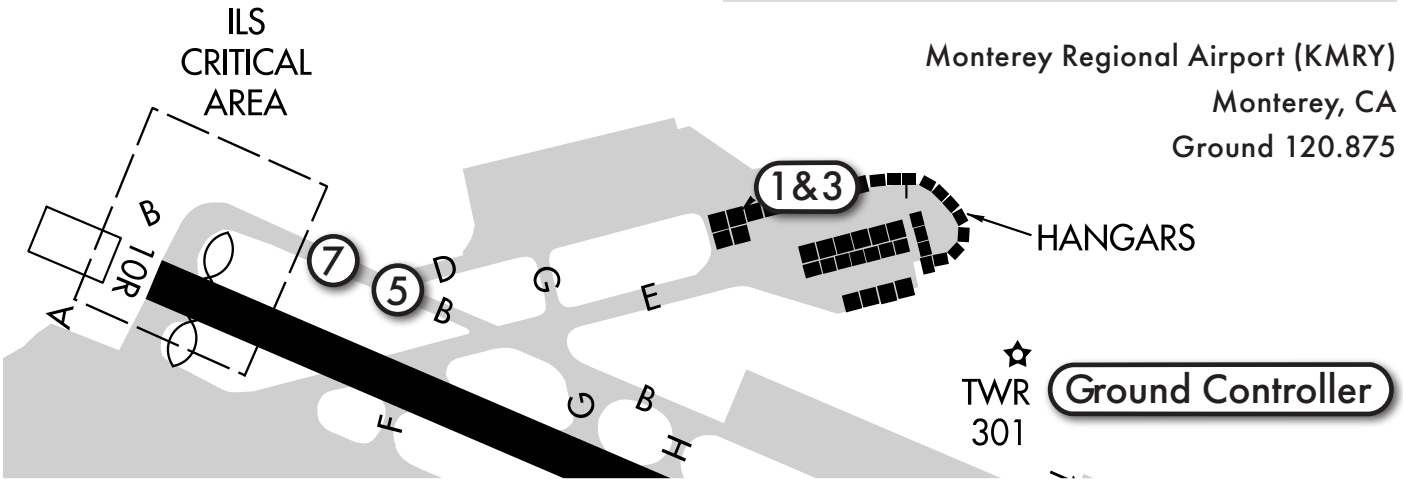
> [Airport name] Ground, [Full call sign], [Location on the airport] with Information [Current ATIS letter] IFR.

Additional taxi instructions common for VFR ops apply to IFR aircraft too, including: runway crossings, holding short of runways or other aircraft, progressive taxi, and intersection takeoffs. See *VFR Communications: A Pilot-Friendly Manual* for more.

There are some taxi instructions you'll only hear when the airport is IFR, such as holding short of the ILS critical area ④. (See also: "ILS Critical Areas" on page 25.) You could even be asked to report reaching a particular spot on the airport if visibility is so low the tower can't see you've made it that far.

TIP

While you taxi, the Tower controller is working with Departure or Center to time your IFR release. (See "The Difference Between a Clearance and a Release" on page 28.) If you know you'll be ready for takeoff as soon as you reach the runway, let Ground know so it's more likely you can depart without delay. Likewise, let them know if you'll be extra long in the runup area.



Monterey Regional Airport (KMRY)
Monterey, CA
Ground 120.875

Announce Taxi to Runway for IFR Departure

Radio calls for taxi at a non-towered airport are the same whether you're VFR or IFR. The only catch is that if you request your IFR departure clearance from the ramp, you'll need to taxi to the runway, do a run-up, and take off before the void time. (See "Don't Mess Around with Clearance Void Times" on page 39). This can tempt one to skimp on things like radio calls, especially when one thinks no one else would be out in weather this lousy. Don't be that pilot.

Just like taxiing for a VFR departure, transmit your position and intentions at key points as you make your way to the runway. The format is:

> [Airport Name] Traffic, [Aircraft type and/or call sign], [Position and/or Intentions]. [Airport Name].

Announcing your taxi from the ramp ① is optional, but it's a good heads up for other pilots that you're moving on the airport surface. The call for takeoff ② is discussed in departures (page 46), but it's here for context. You can find examples of other non-towered airport radio calls in *VFR Communications: A Pilot-Friendly Manual.*

① PILOT
Cassville Traffic, Cirrus Seven Two Bravo, on the ramp, taxi to Runway Two Seven. Cassville.

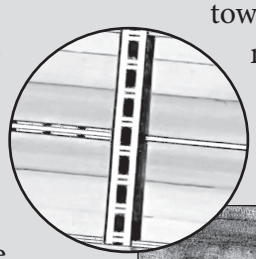
② PILOT
Cassville Traffic, Cirrus Seven Two Bravo, departing Runway Two Seven, northbound. Cassville.

Cassville Municipal (94K)
Cassville, MO
CTAF 122.9

ILS CRITICAL AREAS

The ILS signal is a radio transmission emanating from two locations: the localizer antenna positioned just beyond the departure end of the runway, and the glideslope antenna sitting 1000 feet from the arrival end of the runway to the left or right of the pavement.

In some cases, an aircraft beside one of these antennas can interfere with the ILS transmission, which is a hazard to aircraft flying the approach. At these airports, an ILS critical area is established. When the tower is in operation and either the ceiling is less than 800 feet or the visibility is less than 2 miles, you may be instructed to hold short of this area. It's marked with an "ILS" sign with white characters on a red background. The actual line to hold short of is a yellow horizontal ladder painted across the taxiway. They're also marked on airport diagrams.



ILS critical areas can exist at non-towered airports (including an airport where a part-time tower is closed). Technically, there's no requirement for you to stop short of these areas, but if you believe an aircraft is on approach, it's good practice to respect that line. You'd want somebody else to do that for you.

Request Takeoff IFR (Towered with Handoff to Departure)

① PILOT
Addison Tower, Cirrus Eight Eight Seven Two Bravo, holding short Runway One Five, ready for departure, IFR.

② TOWER CONTROLLER
Cirrus Seven Two Bravo, Addison Tower. Hold short Runway One Five, Awaiting IFR release.

③ PILOT
Holding short. Cirrus Seven Two Bravo.

④ TOWER CONTROLLER
Cirrus Seven Two Bravo, wind calm. Fly heading one six zero, Runway One Five, cleared for takeoff.

⑤ PILOT
Fly heading one six zero. Cleared for takeoff Runway One Five. Cirrus Seven Two Bravo.

⑥ TOWER CONTROLLER
Cirrus Seven Two Bravo, contact Regional Departure. Good evening.

⑦ PILOT
Contact Departure. Cirrus Seven Two Bravo.

⑧ PILOT (on 124.3)
Regional Departure, Cirrus Eight Eight Seven Two Bravo, two thousand climbing four thousand.

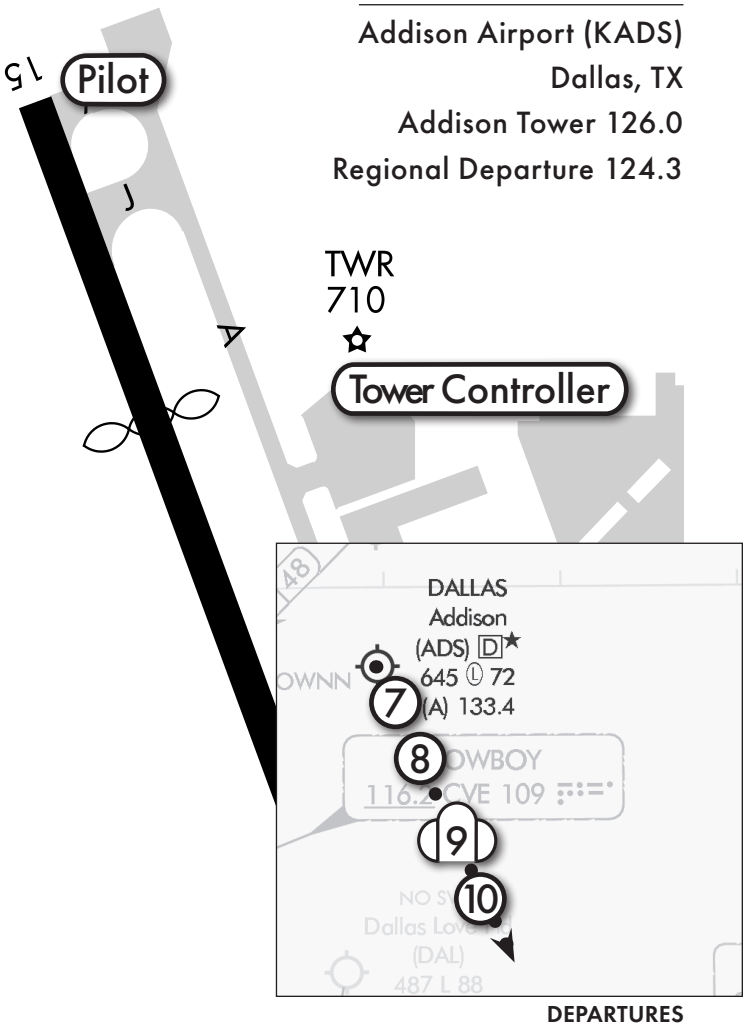
⑨ DEPARTURE CONTROLLER
Cirrus Eight Eight Seven Two Bravo, Regional Departure. Radar contact. Climb and maintain eight thousand.

⑩ PILOT
Climb and maintain eight thousand, Cirrus Eight Eight Seven Two Bravo.

When you're ready to depart IFR, Tower can't clear you for takeoff until you've been released by Departure or Center (see "The Difference Between a Clearance and a Release" on page 28). So remind the controller that you're IFR when you request your takeoff clearance. If it's clear weather, that controller may think you're VFR and clear you for takeoff without your IFR release. That would be a controller error, but we're all in this together. The format is:

> [Airport Name] Tower, [Full call sign], holding short [Runway], (at intersection, if applicable), ready for departure, IFR.

If Tower doesn't have your release yet, you'll be told to hold short ②. As with any hold short instruction, IFR or VFR, read it back. You might have to hold short for some other reason (such as an aircraft landing), line up and wait, or get cleared for takeoff. Additional takeoff instructions common for VFR ops apply to IFR aircraft too, such as "caution wake tur-



Addison Airport (KADS)
Dallas, TX
Addison Tower 126.0
Regional Departure 124.3

bulence." See *VFR Communications: A Pilot-friendly Manual* for more.

Tower may also assign some restriction in that takeoff clearance, such as "Cirrus Seven Two Bravo, on departure, fly heading one eight zero. Runway One Five, cleared for takeoff." Read back whatever you're assigned, and take off. If you were given a heading to fly, wait until you're 400 feet AGL before starting that turn. Note that "on departure" is unnecessary, but some controllers say it anyway.

The big difference with an IFR departure versus a VFR departure is the handoff. It's actually the same process as departing a towered airport with a Class C, or TRSA, airspace. Tower should send you to Departure within one half mile of the departure end if the runway. But don't change frequencies without permission. Tower may be holding onto you for a reason, particularly if the airport is VFR, and Tower is working both VFR and IFR aircraft. If you're concerned Tower forgot about you, say something like: "Cirrus Seven Two Bravo, should we switch to Departure?"

When Tower hands you off, call Departure ⑥ on the frequency from your clearance. If you haven't been given any special instructions, and you're not climbing via a SID (page 32), the format is:

> [Departure facility], [Full call sign], [Current altitude] climbing [Cleared altitude].

Telling the controller what altitude you're passing through ensures the altitude you see matches the one displayed on the radar scope. If you omit your current altitude, the controller will respond with "Say altitude," which is asking for your current altitude. Also state what altitude you're climbing to as a safety check that you and ATC agree how high you're going ⑧.

TIP

The same TRACON controller will answer to "Regional Departure" or "Regional Approach." Calling them Departure is the standard when you're climbing out of an airport. Otherwise, they go by Approach. ARTCC (Center) controllers always go by "[Facility name] Center."

Presuming the altitude the controller sees matches what you report, the controller will say "radar contact." All this means is you've been identified on a radar screen. Because you're IFR, the controller has a responsibility to keep you separated from other aircraft ⑨. "Radar contact" does *not* mean the controller has taken any responsibility for terrain or obstacle avoidance. That's up to you, either through the planning you (hopefully) did when you filed your IFR flight plan, or the departure procedure you're currently flying. Either way, unless you had instructions otherwise, such as a heading to fly, you're flying the route and altitudes in your clearance. A departure procedure includes a route or heading to fly.

If the controller issues a vector for you (page 30), now the controller has taken responsibility for terrain and obstacle avoidance.

CHECKING IN ON A HEADING, DEPARTURE PROCEDURE, ODP, OR VCOA

The first departure controller you check in with after takeoff from a towered airport knows exactly where you're going and how you'll get there. There's no need to tell the controller that you're flying a heading assigned by the tower, or an unrestricted departure procedure.

If your clearance included a "Climb via SID," then checking in that you're climbing via that departure is not only correct, it's mandatory (page 32).

Another reason to say more is if you requested something unusual, such as flying an ODP or a visual climb over the airport (VCOA, page 51). Instead of, "... 1000 climbing 3000 ...," you could say, "... 1000 climbing on the Runway 27 departure procedure."

If you feel you've been on a heading for an uncomfortably long time, it's fine to ask. "Departure, Cirrus Six Whiskey Papa, how much longer on heading 220 before we get on course?"

THE DIFFERENCE BETWEEN A CLEARANCE AND A RELEASE

You need two things to operate under IFR in the national airspace system: a clearance and a release.

The *clearance* is your plan. It says what route you're going to fly, what altitude you want, and how long it should take you to get from point A to B. When you get your IFR clearance, you're ensuring that you and ATC agree on that plan.

The *release* is permission to execute that plan. ATC must ensure enough separation between IFR aircraft, so the timing of the execution of your plan has to interweave through the execution of everyone else's plan. When you're ready to depart, and there's a big enough opening between other IFR aircraft, then you can get a release and take off.

At a towered airport, this process is largely invisible to you. The controllers watch your progress toward the runway and negotiate your release so that it's ready about the time they expect you to call Tower. If the timing works out, you'll get cleared for takeoff when you call Tower. If not, you'll hear "Hold for release," as on page 40.

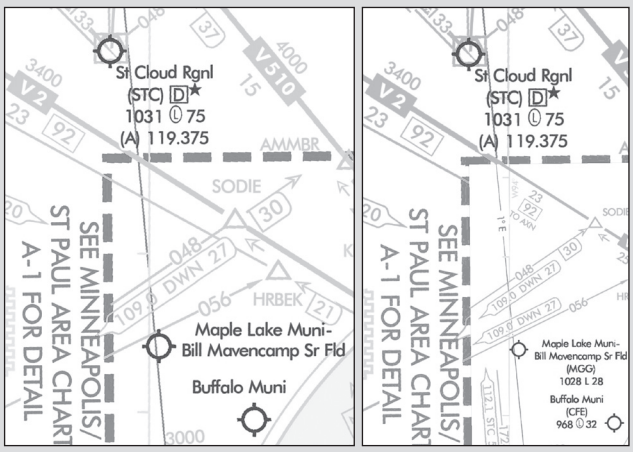
At a non-towered airport, you often get your clearance and your release in the same communication (page 38). The timing of the release is trickier, because there's a "one-in, one-out" rule. Once you get your release, no other IFR traffic can enter or depart the area (not just the airport) until you report airborne.

LOW CHART MISSING INFO?

We get so used to reading information off the "background" layer on our tablets that it's easy to forget that these represent real paper charts.

You can see remnants of that with IFR area charts. These are detailed charts of higher fidelity in busy airspace, similar to VFR Terminal Area Charts. What catches some people off guard is that information about airports within these area charts is stripped out from the IFR Enroute Chart, and that chart is shown on a tablet until you zoom in. So you won't see some key details without zooming, or on some apps without downloading the extra chart.

Of course, if you still use paper, you'll need both physical charts (oh, the horror).



OTHER THINGS DEPARTURE MIGHT SAY

There are many things your first departure controller might say besides, "radar contact."

"Check transponder on" means the controller can't see your transponder signal on the scope. Did you remember to turn it on?

"Recycle your transponder" is just a fancy way of saying, "Try turning it off and back on again, and we'll see if it works then."

"Reset transponder; squawk [code]" only means you should enter a new code. It doesn't mean you did anything wrong or need to turn the transponder off and on again.

"Stop altitude squawk" is pretty unlikely these days, but if your transponder is putting out the wrong altitude, it will set off alarms when the system thinks you're too close to other aircraft. Switch from ALT to ON.

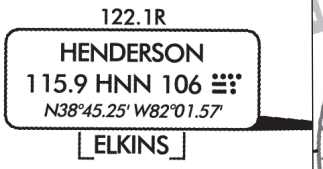
"Amend altitude ..." precedes a new climb-and-maintain altitude. Read back the actual altitude instruction that came after these words.

"Best rate through [altitude]" is said when ATC needs you to climb as fast as practical through a certain altitude to prevent a conflict.

"Upon reaching [altitude or fix] ..." lets the controller give you an instruction, such as direct to a fix, during a free moment, but that won't take effect until later.

When you depart a towered airport, 99 percent of the time, you'll be flying a departure procedure, or a heading, assigned in your clearance or assigned by Tower just before you took off. Many of those departure procedures also end on a heading, so quite a few departures from towered airports leave you holding a heading and altitude, waiting for Departure or Center to clear you on course.

When you check in with your current altitude and the one you're climbing to ①, out of a towered airport, the controller assumes you have the correct altimeter setting. Departing a non-towered airport, the controller will give you the altimeter setting to ensure it matches the one ATC is using



At this point, you're waiting for permission to join the route in your clearance, and the simplest next step will be exactly that, along with a clearance up to your cruise altitude ③. In this case, Henderson would be a fix in your cleared route. The unspoken understanding is that after crossing Henderson you would continue on your cleared route. Note that instructions for "Direct [fix]" qualify as a vector. The controller has taken over responsibility for terrain and obstacle clearance until you reach Henderson.

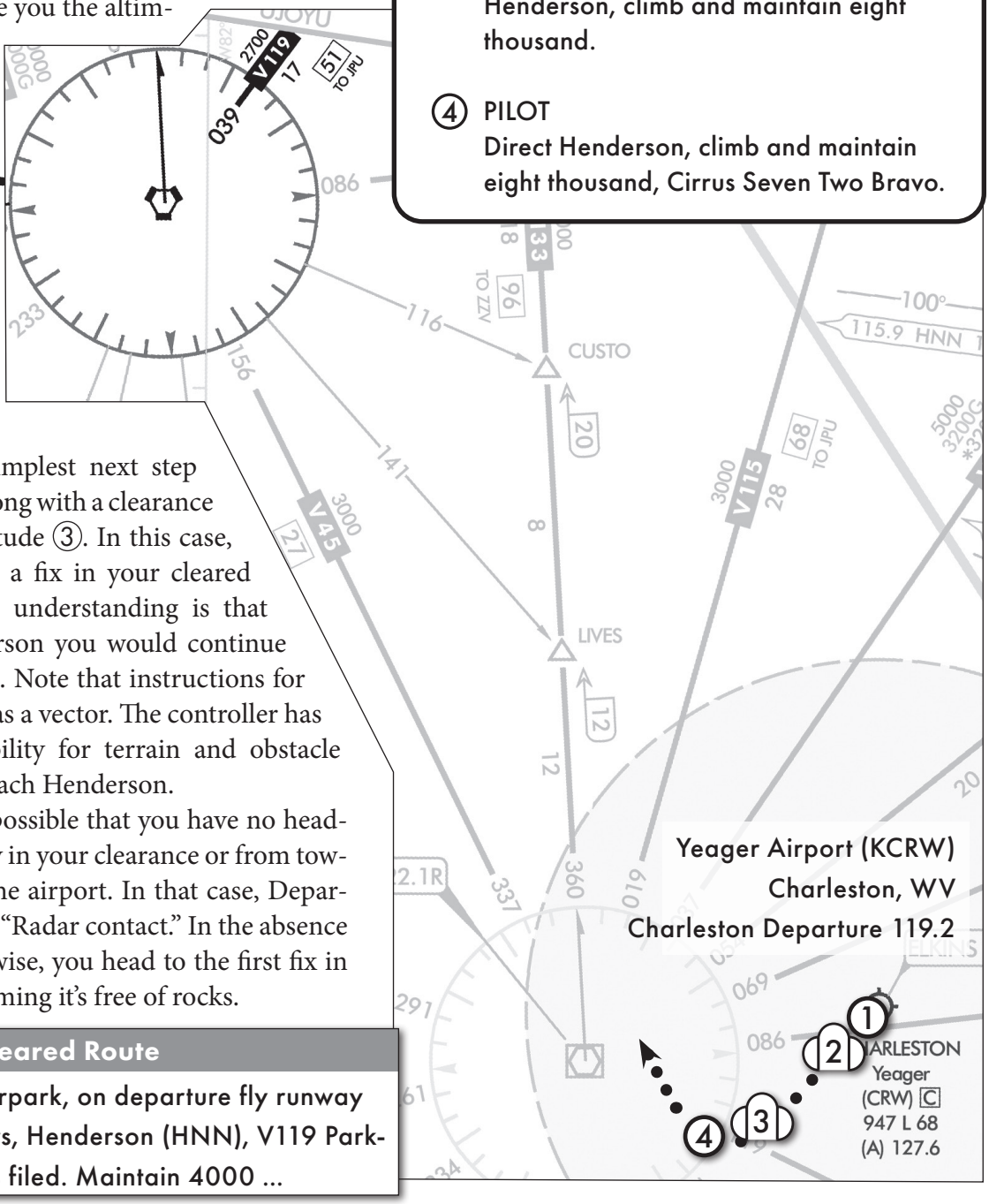
It's rare, but it's possible that you have no heading or procedure to fly in your clearance or from tower, and no ODP for the airport. In that case, Departure could simply say, "Radar contact." In the absence of instructions otherwise, you head to the first fix in your clearance, presuming it's free of rocks.

① PILOT
Charleston Departure, Cirrus Eight Eight Seven Two Bravo, two thousand climbing four thousand.

② DEPARTURE CONTROLLER
Cirrus Eight Eight Seven Two Bravo, Charleston Departure, radar contact.

③ DEPARTURE CONTROLLER
Cirrus Seven Two Bravo, cleared direct Henderson, climb and maintain eight thousand.

④ PILOT
Direct Henderson, climb and maintain eight thousand, Cirrus Seven Two Bravo.



Cleared Route

Cleared to Willard Airpark, on departure fly runway heading, radar vectors, Henderson (HNN), V119 Parkersburg (JPU), then as filed. Maintain 4000 ...

Contact Departure (with Vectors)

① PILOT
Jacksonville Departure, Cirrus Eight Eight Seven Two Bravo, one thousand five hundred climbing three thousand.

② DEPARTURE CONTROLLER
Cirrus Eight Eight Seven Two Bravo, radar contact. Fly heading two four zero, climb and maintain eight thousand.

③ PILOT
Two four zero, climb and maintain eight thousand, Cirrus Eight Eight Seven Two Bravo.

④ DEPARTURE CONTROLLER
Cirrus Seven Two Bravo, amend altitude: Climb and maintain five thousand.

⑤ PILOT
Climb and maintain five thousand. Cirrus Seven Two Bravo.

⑥ DEPARTURE CONTROLLER
Cirrus Seven Two Bravo. I'll have higher for you shortly.

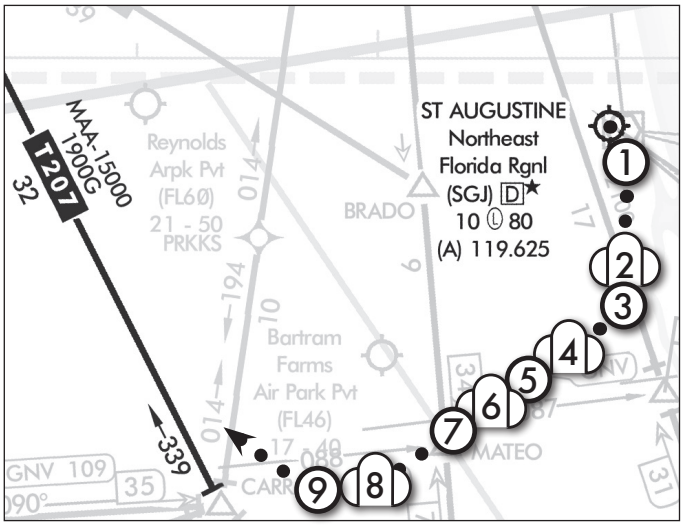
⑦ PILOT
Roger. Cirrus Seven Two Bravo.

After enough time that you wonder if the ATC has a different meaning for "shortly" ...

⑧ DEPARTURE CONTROLLER
Cirrus Seven Two Bravo, fly heading three one zero, join Tango Two Zero Seven, then resume own navigation. Climb and maintain eight thousand.

⑨ PILOT
Heading three one zero, join Tango Two Zero Seven, then resume own navigation. Climb and maintain eight thousand. Cirrus Seven Two Bravo.

Northeast Florida Regional Airport (KSGJ)
St. Augustine, FL
Jacksonville Departure 120.75



If your departure from a towered airport involves flying a heading, or using a departure procedure that includes a heading while awaiting a vector, then your check in with Departure will include the controller assigning you a vector.

The first step is positively identifying you on radar ②. This must occur before a vector can be issued. Then the controller can issue you a heading to fly, and possibly a new climb-to altitude ②. That vector might be part of a local procedure. You may be on a SID that includes radar vectors in an initial segment. Or, there may be traffic the controller needs to keep you away from.

While hearing "radar contact" does not mean the controller will provide separation from terrain and obstructions, receiving a radar vector does. Always read back the essential elements of the vector ③ or any subsequent changes to those instructions ⑤. Do so promptly, because the controller is waiting for your reply, and may be holding off on giving another aircraft an instruction to give you time to speak. Don't make the controller wait too long.

Don't let the sense of relief from being vectored (since someone else is telling you what to do) cause your attentiveness to wane regarding your position or the aircraft systems. Maintain situational awareness so that when the controller finally says, "Resume own navigation," you can effortlessly transition back onto your cleared route.

Renton Municipal (KRNT)
Renton, WA
Seattle Departure 119.2

The majority of departure procedures are simple headings to fly to an altitude while you wait for radar vectors. These will always be included by name in your clearance, even if you filed them. However, unless you heard "Climb via SID" in your clearance, you don't need to report that you're flying that procedure when you contact your first departure controller. The controller knows. Simply check in with your current altitude and the one you're climbing to ①.

You do, however, need to fly the procedure as charted until you get that vector. On the RENTN THREE, you'd change heading from 150 to 130 as you pass 1000 feet MSL, even though the controller responded with, "radar contact." You should get a vector soon ③, which might not be on the departure procedure chart, but should be somewhere in your filed route. VAMPS is on the Enroute Chart southeast of Renton Municipal.

If you reach 3000 feet before getting the vector and new altitude, you level at 3000 feet on heading 130. You should get higher within five minutes of departure, so watch that time, and query the controller if time is running out and you haven't heard further instructions.

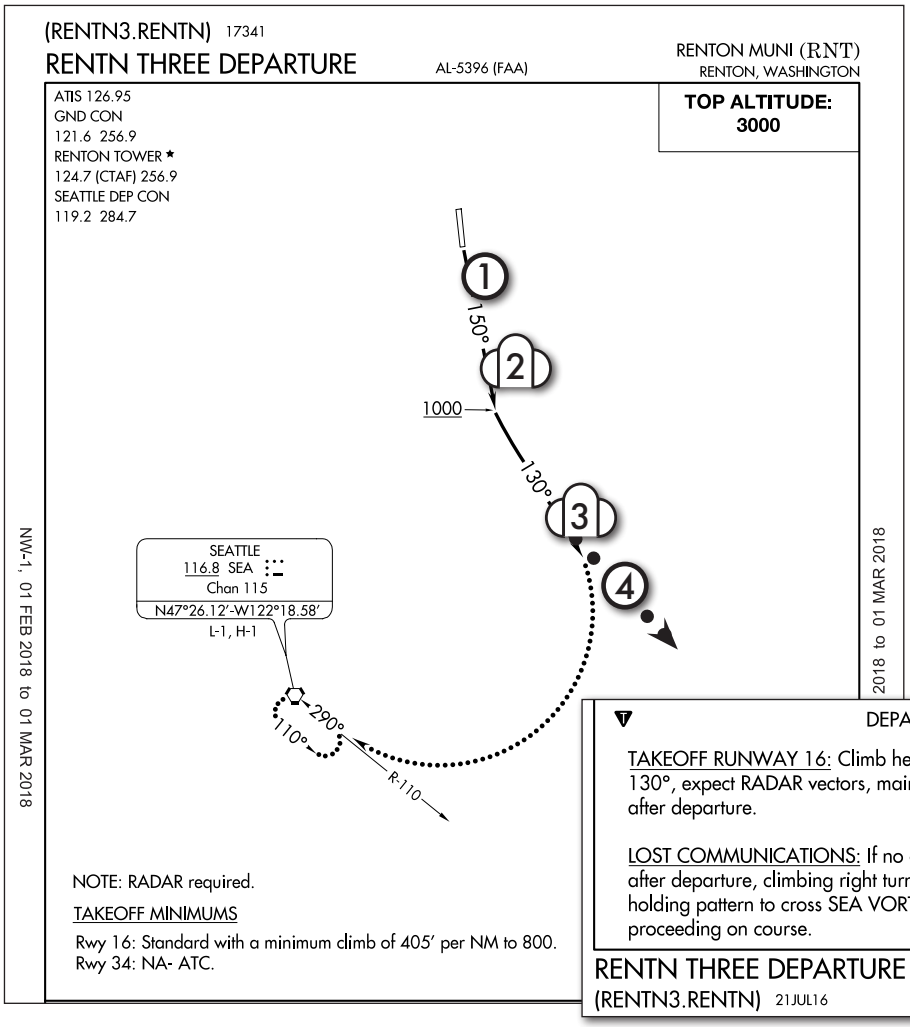
If, after troubleshooting, you believe you've lost communications (page 116), fly the lost comm procedure (dotted line).

① PILOT
Seattle Departure, Cirrus Eight Eight Seven Two Bravo, eight hundred climbing three thousand.

② DEPARTURE CONTROLLER
Cirrus Eight Eight Seven Two Bravo, radar contact.

③ DEPARTURE CONTROLLER
Cirrus Eight Eight Seven Two Bravo, direct VAMPS then resume own navigation. Climb and maintain niner thousand.

④ PILOT
Direct VAMPS. Climb and maintain nine thousand. Cirrus Eight Eight Seven Two Bravo.



Contact Departure (on a Departure Procedure with "Climb via SID" Clearance)

① PILOT
Potomac Departure, Cirrus Eight Eight Seven Two Bravo, one thousand one hundred, climbing via the Kalli Three Departure.

② DEPARTURE CONTROLLER
Cirrus Eight Eight Seven Two Bravo, Potomac Departure, radar contact.

TIP

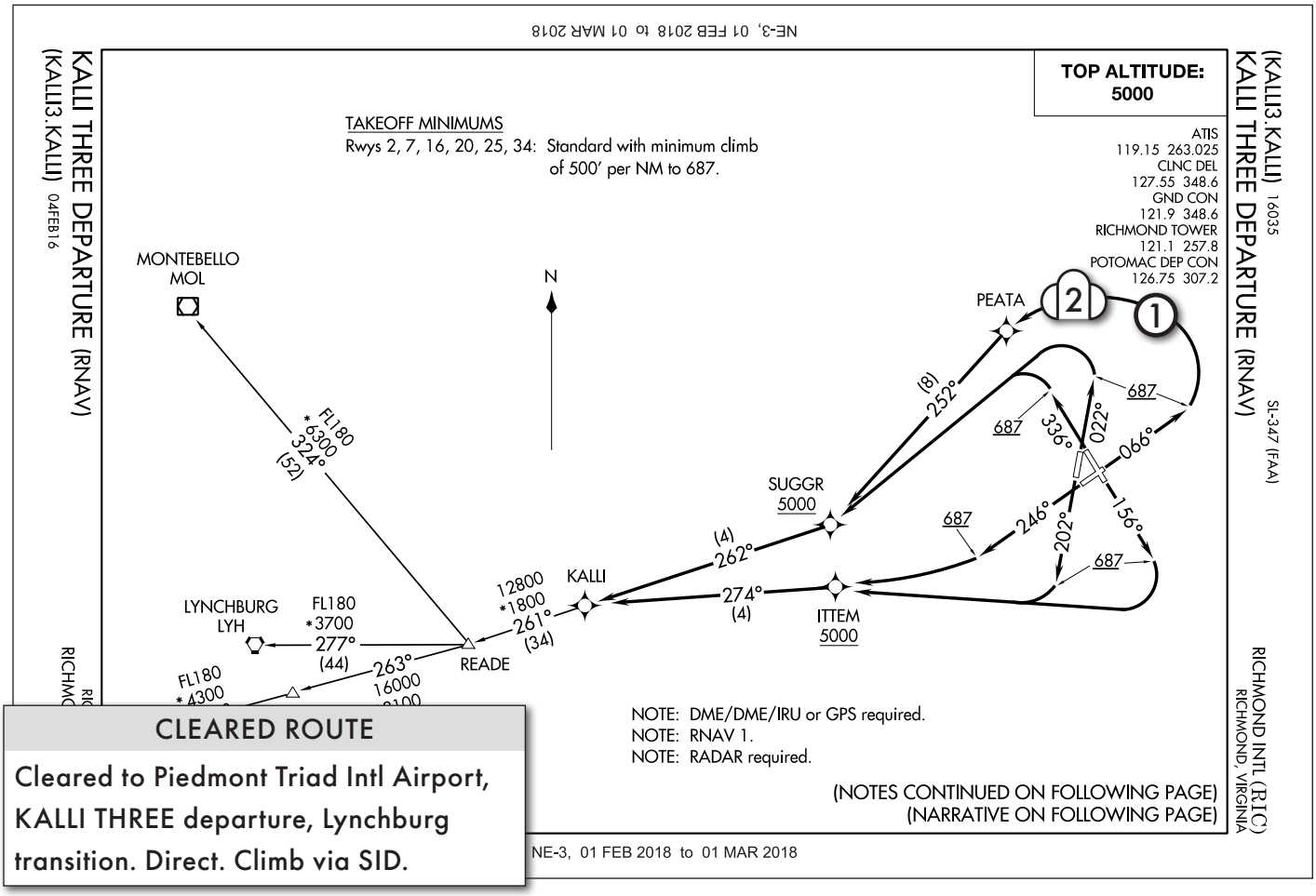
It's acceptable to use the term "leaving" even if you are passing through an altitude, so "Potomac Departure, Cirrus Eight Eight Seven Two Bravo, leaving one thousand one hundred ..." would be equally correct. So would "Potomac Departure, Cirrus Eight Eight Seven Two Bravo, leaving one thousand one hundred for seven thousand ..." if you had received 7000 feet as a top altitude.

If you received a "climb via SID" in your clearance, then you must check in with Departure by stating you're climbing via that SID ①. The format is:

> [Departure facility], [Full call sign], [Current altitude], climbing via the [SID name and number] departure.

If the controller has no reason for you to leave that SID, the reply may contain no more than, "Radar contact" ②. You continue to fly the SID as charted, including any published altitude and speed restrictions along the way. You'd also fly any transitions in your clearance, and join the route specified in your clearance. It's quite possible the only instructions you'll receive from ATC are frequency changes.

If your clearance included "climb via SID except maintain," you must state that amended top altitude in your initial call: "Potomac Departure, Cirrus Eight Eight Seven Two Bravo, one thousand one hundred climbing seven thousand, climbing via the Kalli Three Departure." Yeah, you say "climbing" twice.



CLEARED ROUTE

Cleared to Piedmont Triad Intl Airport, KALLI THREE departure, Lynchburg transition. Direct. Climb via SID.

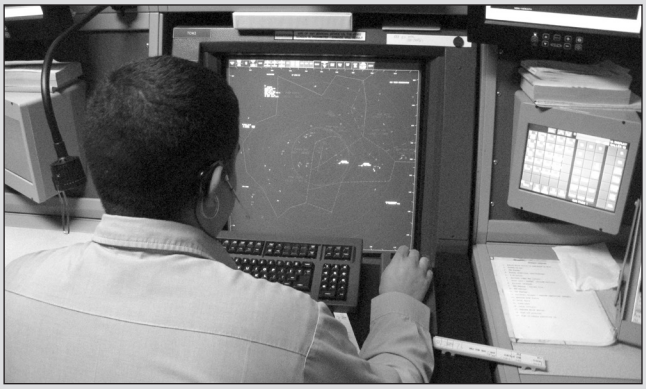
SID PHRASEOLOGY

It's one thing to pull out your secret decoder ring for SIDs on the ground. It's something else to get it all straight while you're busy flying the aircraft. The next pages give some examples, but here are the important highlights. Some are the same for Standard Terminal Arrival Routes (STARs), and some are slightly different outside U.S. airspace.

If you're climbing via a SID and ATC tells you to "**Maintain [altitude]"** or **"Climb and Maintain [altitude]**," intermediate altitudes no longer apply. Follow the published route, and any speed restrictions, but climb directly to the new altitude.

"Climb via [SID name]" in the air means complying with the published lateral route and all published altitude and speed restrictions. However, it also cancels any ATC adjustments previously put into effect. If you checked in on the KALLI THREE climbing through 1100 feet and ATC told you to maintain 2000, you would stop climbing at 2000 feet. That controller later telling you to "Climb via SID," clears you to continue to the top altitude of 5000 feet.

"Climb via [SID name], except maintain [altitude]" has the same meaning as in a clearance on the ground, fly the SID, including any restrictions, but to an amended top altitude.



"Climb via [SID name], except cross [fix] at [altitude]" is a way of changing just one crossing restriction. All the rest remains unchanged, as does the top altitude.

ATC might vector you off a SID and then later put you back onto it. (See "Vectors Off and Back onto a SID" on page 35). In this case, once you're rejoining the procedure you might hear, **"Resume the [SID name] departure, comply with restrictions,"** or **"Resume the [SID name] departure, climb via SID."**

Speed restrictions from ATC, or on the chart, are much more common with STARs flown in fast aircraft, but **"Maintain [speed]"** is just what it seems: Fly that speed no matter what the chart says until told otherwise.

"Resume normal speed" cancels any ATC speed restrictions and makes speed pilot's discretion (FARs still apply), but upcoming published restrictions remain in effect.

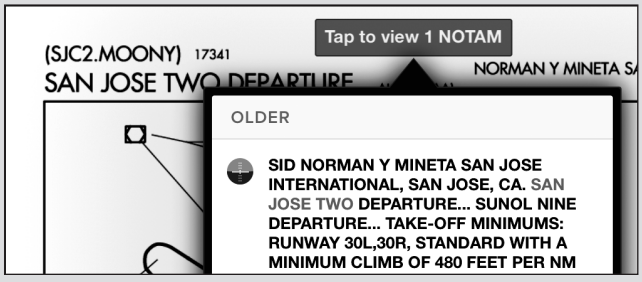
"Resume published speed" is like resume normal speed, but issued when on a segment where a published restriction would be in effect.

"Delete speed restrictions" cancels any speed restrictions assigned by ATC as well as any published for the procedure.

It gets more interesting when the controller combines these phrases: "Proceed direct FIXIE, maintain 3000 until crossing FIXIE, then climb via the GROUCH SEVEN Departure." If you're unsure what you're supposed to do, ask for clarification.

NOTAMS: PART OF COMMUNICATIONS

New IFR pilots are shocked how many more NOTAMs there are to check. (This is when they really understand how convoluted the NOTAM system is.) If you didn't file a departure, it would be easy to skip checking them for changes, so at least ensure you've downloaded the NOTAMs and can do a quick review when they appear in your clearance.



Contact Departure (and Receive "Climb via SID" from ATC)

① PILOT
SoCal Departure, Cirrus Eight Eight Seven Two Bravo, one thousand.

② DEPARTURE CONTROLLER
Cirrus Eight Eight Seven Two Bravo, SoCal Departure. Radar contact.

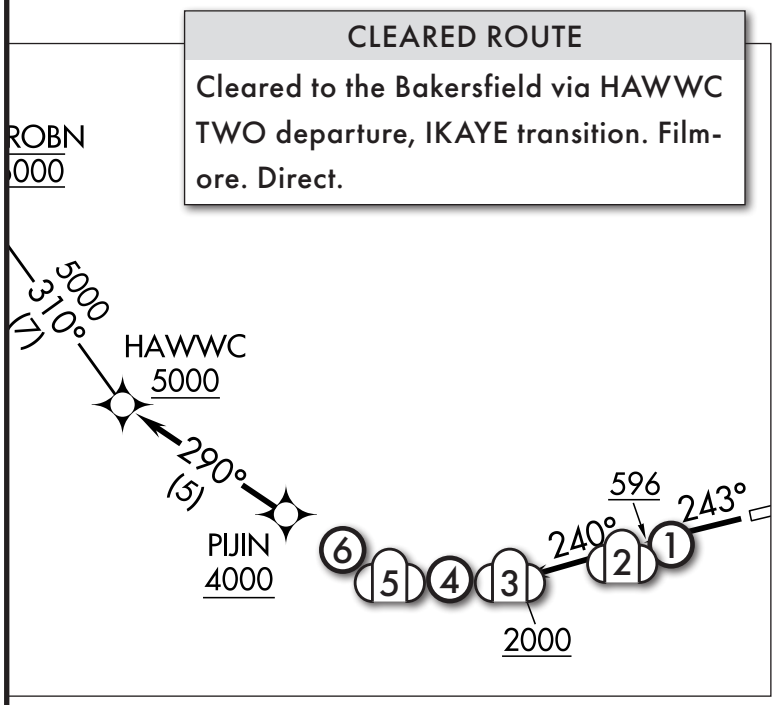
③ DEPARTURE CONTROLLER
Cirrus Eight Eight Seven Two Bravo, fly heading two five zero. Maintain three thousand.

④ PILOT
Fly heading two five zero, maintain three thousand. Cirrus Eight Eight Seven Two Bravo.

⑤ DEPARTURE CONTROLLER
Cirrus Seven Two Bravo, proceed direct PIJIN, climb via the HAWWC TWO departure.

⑥ PILOT
Direct PIJIN, climb via the HAWWC TWO departure, Cirrus Seven Two Bravo.

Fullerton Municipal Airport (KFUL)
Fullerton, CA
SoCal Departure 124.65



The phrase "Climb via SID" in your clearance means follow the published route (including all restrictions) as you climb to the top altitude.

If a SID contains vectors, or a controller takes you off a SID with a vector ③, you could hear "Climb via SID" from ATC when the controller puts you back onto a SID ⑤. The phrase reinstates all the restrictions of the SID from the point you rejoin it onward.

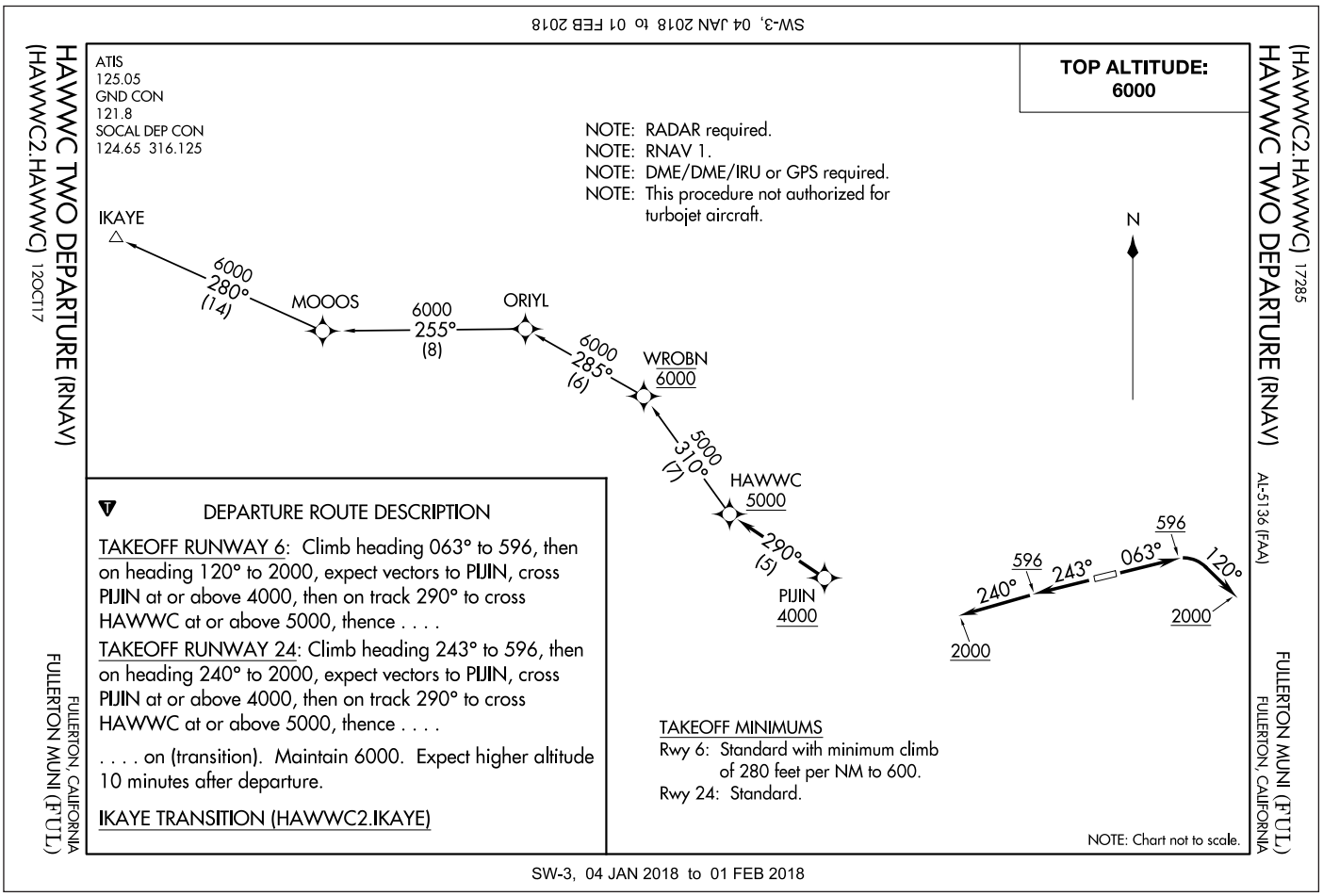
Note that even though the HAWWC TWO has an altitude restriction for a course change before you would get vectors (turn to 240 above 596 feet), under the current FAA phraseology, you would not get "climb via SID" in your clearance (See "'Climb Via' in a Clearance isn't Supposed to be a Heads Up, But it Is" on page 19). No "climb via" phrase in your clearance means you would not state that in your initial call to Departure ①.

TIP

"Climb via SID" and "Climb via the [SID name and number] departure" mean the same thing.

At least, you're not supposed to. If you weren't confident you were supposed to follow SID routing before a vector, saying you were, "climbing via the HAWWC TWO Departure," wouldn't get you in trouble, and would cause ATC to speak up right away if that wasn't what you should do. Sometimes controllers state to "Climb via SID" in this case, even when you're already on a SID, to reinforce the point that there are restrictions ahead of you, even if that's not official phraseology. However, it could mean something: If you had been given an altitude restriction— "Climb via SID except maintain [altitude]— an instruction to "Climb via SID" would reinstate the published top altitude.

A vector off a SID cancels all restrictions, so the controller must include a heading and altitude ③. (See "Vectors Off and Back onto a SID" on page 35.) When you're instructed to rejoin a SID with



the "climb via" phraseology ⑤, you must read it back exactly ⑥. Saying, "Direct PIJIN then the HAWWC TWO," or "Direct PIJIN then climb on the departure," doesn't cut it. Note that you're not given an altitude in ⑤ because "Climb via SID" implies you must comply with crossing PIJIN at or above 4000 feet (as well as HAWWC at or above 5000 feet and WROBN at exactly 6000 feet). If there was no altitude published for PIJIN on the chart, one would have been assigned by ATC with the climb via instructions.

VECTORS OFF AND BACK ONTO A SID

When ATC issues that vector, you're no longer bound by the SID, so you should receive a heading and an altitude ③. Sometimes this is part of the design of the SID, as with the HAWWC TWO.

ATC might take you off a SID when you don't expect it. This cancels any restriction in effect from the SID, but you'll get the reason from ATC. If you can expect to rejoin the SID later, you'll hear that too. "Cirrus Seven Two Bravo, fly heading one five zero for spacing, maintain 3000. Expect to resume the HAWWC TWO departure." While on the vector, ATC has responsibility for your obstacle clearance.

To put you back onto a SID, the controller can send you direct to a fix, or have you intercept a published route. Unless that clearance was directly to a fix with a published altitude, the clearance would include an altitude to maintain until rejoining the procedure. Here, there is a published altitude for PIJIN, so you'd proceed direct PIJIN ⑤ to cross it at or above 4000 feet, and then follow the published courses and altitudes for the SID.

If you ask to leave a SID, perhaps for weather blocking the route, and ATC approves, your climb via clearance is canceled. It's only reinstated if ATC has you rejoin and issues a "climb via."

Contact Departure (and Receive "Climb via Except ...")

① PILOT
Potomac Departure, Cirrus Eight Eight Seven Two Bravo. One thousand, climbing via the ARSENAL FIVE departure.

② DEPARTURE CONTROLLER
Cirrus Eight Eight Seven Two Bravo, Potomac Departure. Radar contact. Climb via SID, except maintain two thousand. I'll have higher for you shortly.

③ PILOT
Climb via SID except maintain two thousand, Cirrus Eight Eight Seven Two Bravo.

④ DEPARTURE CONTROLLER
Cirrus Seven Two Bravo, climb via SID.

⑤ PILOT
Climb via SID, Cirrus Seven Two Bravo.

⑥ DEPARTURE CONTROLLER
Cirrus Seven Two Bravo, climb and maintain six thousand.

⑦ PILOT
Leaving three thousand, climb and maintain six thousand. Cirrus Seven Two Bravo.

CLEARED ROUTE

Cleared to the Roanoke-Blacksburg Airport via ARSENAL FIVE, Montebello transition, direct. Climb via SID.

TIP

It's possible to get, "... climb via SID except maintain [altitude] ..." in your initial clearance on the ground. In that case, you fly the SID as published but with a new top altitude as assigned.

Manassas Regional Airport (KHEF)
Manassas, VA
Potomac Departure 128.525

While "Climb via SID" means climb to the published top altitude, "Climb via SID except maintain …" means climb to an ATC-issued top altitude. That could be because there's no top altitude published in the SID, or because ATC wants you to level off at a different altitude.

The top altitude for the ARSENAL FIVE is 3000 feet, and your clearance on the ground simply included "Climb via SID." There would be no altitude given in the clearance, because the SID specifies your first top altitude, and no departure frequency because it's on the departure chart. The next thing after "Climb via SID" in your clearance would be a squawk code. If you departed Runway 34L or 34R, you'd climb heading 341 until passing 800 feet, after which you'd turn left to intercept R-056 to CSN while climbing to 2000 feet. After SHRLI, you'd climb to 3000 feet. You'd anticipate a higher altitude somewhere after CSN.

Because you have this complete plan, when you contact Departure and say you're climbing via the SID ①, you're expecting a simple "Radar contact."

The revised clearance of "Climb via SID, except maintain two thousand" ②, means you continue following the SID route, and climb to meet the published restriction of crossing SHRLI at exactly 2000 feet, but then stay at 2000 feet since it's your new ATC-issued top altitude.

When the Departure controller says, "Climb via SID" ④, it reinstates the original top altitude, along with any published restrictions along the way. Continue following the SID route, and continue climbing to the top altitude (3000 feet).

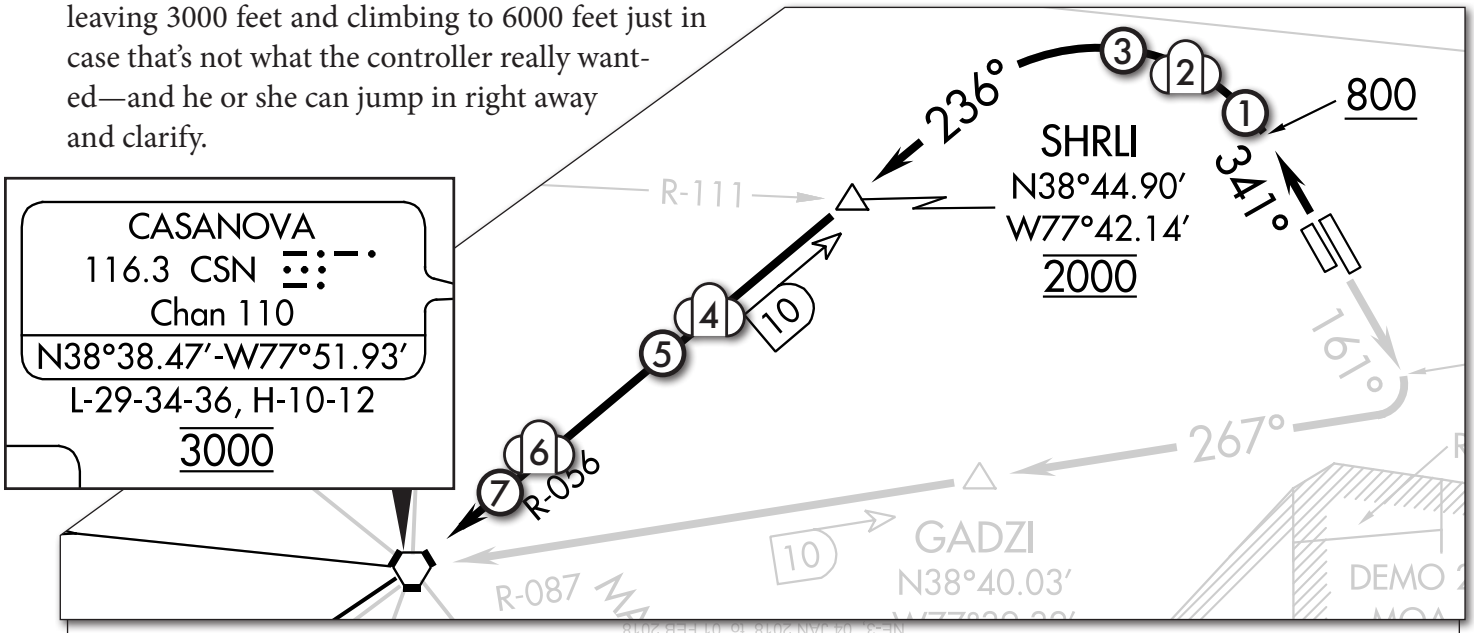
Without further instructions, you'd cross CSN at 3000 feet. If the controller had said in ⑥: "Cirrus Seven Two Bravo, climb via SID, except maintain six thousand," then 6000 feet would be the new top altitude, but all other restrictions would still be in effect. You would have held 3000 feet until crossing CSN, and then climbed to 6000 feet.

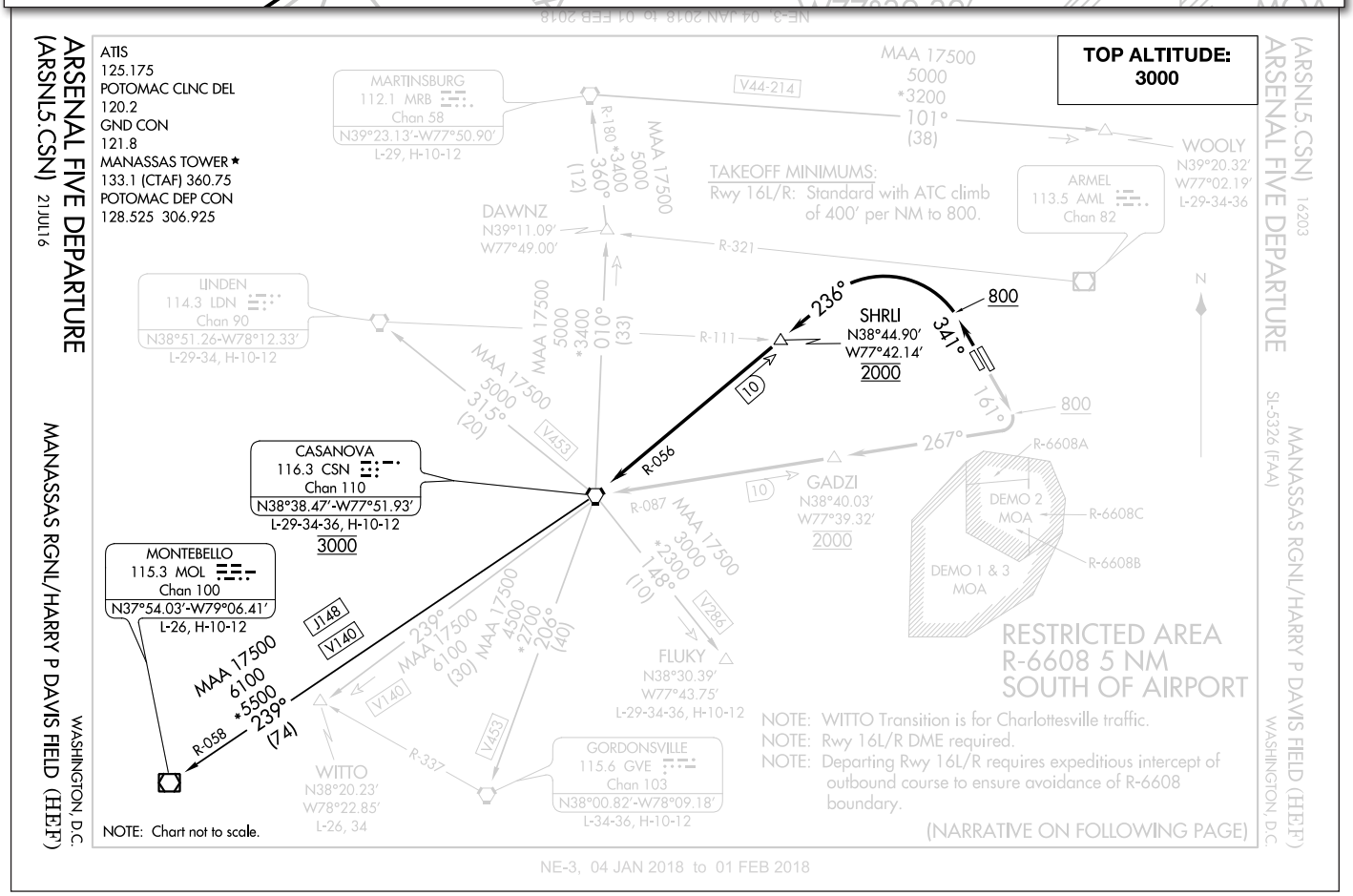
However, the controller told you to, "Climb and maintain six thousand." This overrides all altitude restrictions and allows an unobstructed climb to 6000

feet. That's subtle, but critical to get right. That's why, while you could simply read back the altitude you're climbing to, it's better to say you're leaving 3000 feet and climbing to 6000 feet just in case that's not what the controller really wanted—and he or she can jump in right away and clarify.

TAKEOFF RWY 34L/R: Climb heading 341° to 800, then climbing left turn on CSN VORTAC R-056. Cross SHRLI INT/CSN 10 DME at 2000, cross CSN VORTAC at 3000. Thence....

MONTEBELLO TRANSITION (ARSNL5.MOL): From over CSN VORTAC on CSN R-239 and MOL R-058 to MOL VOR/DME.





Request an IFR Clearance at a Non-Towered Airport (via Clearance Delivery)

① PILOT
Charlotte Clearance, Cirrus Eight Eight Seven Two Bravo, on the ground at Rock Hill. IFR to Myrtle Beach, request clearance.

② CLEARANCE DELIVERY CONTROLLER
Cirrus Seven Two Bravo, standby.

After a minute ...

③ CLEARANCE DELIVERY CONTROLLER
Cirrus Seven Two Bravo, advise when ready to copy.

④ PILOT
Ready to copy. Cirrus Seven Two Bravo.

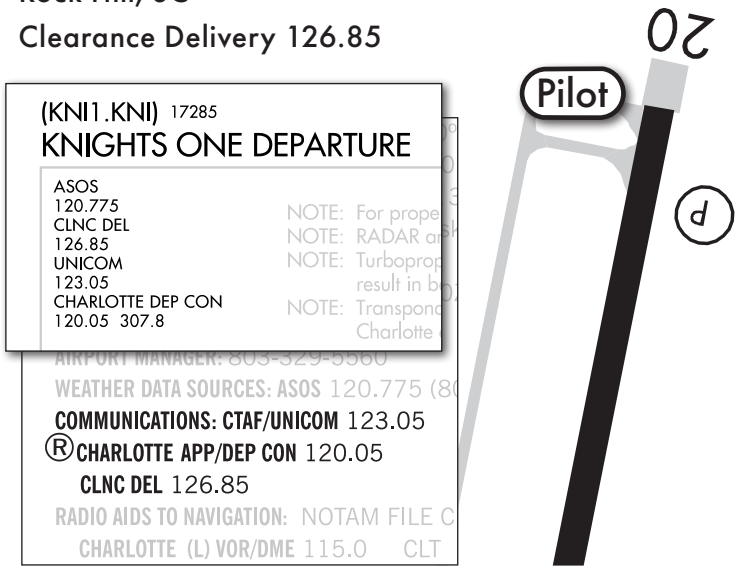
⑤ CLEARANCE DELIVERY CONTROLLER
Cirrus Eight Eight Seven Two Bravo cleared to the Myrtle Beach International Airport via the KNIGHTS ONE departure, HAMLN transition, then as filed. Maintain three thousand, expect seven thousand one zero minutes after departure. Departure frequency will be one two zero point zero five, squawk two six zero one. Hold for release.

⑥ PILOT
Cirrus Eight Eight Seven Two Bravo is cleared to Myrtle Beach International Airport, KNIGHTS ONE departure, HAMLN transition, then as filed. Maintain three thousand, expect seven thousand one zero minutes after departure. Departure on one two zero point zero five, squawk two six zero one. Hold for release.

TIP

If the Clnc Del name isn't listed, use the name of the Approach or Center, in this case "Charlotte."

Rock Hill/York County Airport (KUZA)
Rock Hill, SC
Clearance Delivery 126.85



Non-towered airports pose a unique problem for IFR communications. There are no controllers at the airport to issue your clearance and time your release, yet you must communicate with ATC in some way to get both those things before you depart IFR. (See "The Difference Between a Clearance and a Release" on page 28.)

The best way to get both of those things is contacting ATC on the ground, while holding short of the runway and ready to depart as soon as possible. That's why IFR clearances from non-towered airports appear in the "Departures" section of this book. They are best thought of as a step in departing the airport.

If the Chart Supplement shows a Clearance Delivery frequency for the airport, you're golden. Call that frequency to get your clearance, but do it after runup and holding short of the departure runway.

If there's no Clearance Delivery frequency then the best choices for getting your clearance and release on the ground are (in descending preference): phoning Approach or Center (page 41), radioing Approach or Center (page 40), radioing Flight Service (page 42), or phoning Flight Service (page 44).

The first part of the communication ① is nearly identical to calling Clearance Delivery at an airport, except the location you say is the airport you're at, rather than your location on an airport. Be patient on the reply ②, as the controller may be working several airports and frequencies.

The first big difference is when the controller asks the runway you'll use and when you'll be ready to depart ⑦. (This question could be asked at the onset ②, but usually isn't.) ATC needs to know your runway of departure to anticipate your location and direction as you appear on radar. If you're flying a specific departure procedure, such as an ODP, it's good to mention it here, "We'll be departing on the Runway 20 ODP."

The time you're departing is even more important because it allows for your release. Non-towered airports are "one-in/one-out," meaning you are the only IFR aircraft allowed in that airspace. Because ATC must protect airspace you might fly into before they see you on radar, your departure could impact IFR operations at nearby airports as well. For this reason, your release is actually a time window that opens with the release time, and closes with a clearance void time ⑨. See below for more about clearance void times.

This is why you want to be ready to go when you call for a clearance, if possible. In busy areas, that release window could be as small as *two* minutes. You're talking directly with ATC, so if you have to negotiate a longer window, or need an extra five minutes before that window opens, ask for what you need.

⑦ CLEARANCE DELIVERY CONTROLLER
Cirrus Seven Two Bravo, readback correct. Which runway will you be departing and how soon will you be ready to go?

⑧ PILOT
Departing Runway Two Zero, and we're ready to go right now, Cirrus Seven Two Bravo.

⑨ CLEARANCE DELIVERY CONTROLLER
Cirrus Seven Two Bravo, you're released for departure. Clearance void if not off by one seven five zero Zulu. If not off by one seven five zero Zulu, advise Charlotte Approach not later than one eight zero zero Zulu of intentions. Time now is one seven four five Zulu.

⑩ PILOT
Released for departure. Clearance void if not off by one seven five zero Zulu. Cirrus Seven Two Bravo.

DON'T MESS AROUND WITH CLEARANCE VOID TIMES

Your IFR release from a non-towered airport will always include a "clearance void time." Because there's no tower, ATC doesn't know where you are, or what you're doing, until you're airborne and in communication. This is why ATC must protect a much larger block of airspace than just the airport for your departure. You won't check in immediately after takeoff, and could have strayed pretty far from the airport by the time you do. Even if you could be talking to ATC right after takeoff (and you usually can't because you're too low), you're also talking on the airport CTAF announcing your departure (page 46).

The importance of the void time becomes obvious if you contemplate what happens if you *don't* check in with ATC after your void time plus 10 minutes elapses. They must now assume one of three things is true: You're airborne and have lost the ability to communicate, you aborted the takeoff and are still on the ground at the airport, or you crashed on departure.

If ATC can see your transponder, they know it's the first one. If they can reach you by phone, or someone at your departure airport, they can probably figure out the second. If they can't do either of those within 30 minutes of your void time, they'll likely launch search and rescue looking for the wreckage.

If you're not airborne by the void time, call FSS or ATC with an update. Departing after that void time is an FAR violation. You no longer have a valid IFR clearance.

Request an IFR Clearance at a Non-Twr'd Airport (via ATC with Hold for Release)

① PILOT
Denver Center, Cirrus Eight Eight Seven Two Bravo, on the ground at Laramie, request.

② CENTER CONTROLLER
Cirrus Eight Eight Seven Two Bravo, Denver Center. Go ahead with request.

③ PILOT
Cirrus Eight Eight Seven Two Bravo, we have an IFR flight plan on file Laramie to Casper, request clearance.

④ CENTER CONTROLLER
Cirrus Eight Eight Seven Two Bravo, standby.

After handling a few other aircraft ...

⑤ CENTER CONTROLLER
Cirrus Seven Two Bravo, advise when ready to copy.

⑥ PILOT
Ready to copy. Cirrus Seven Two Bravo.

TIP

Make sure there's enough room for a VFR departure to taxi past you when you call for clearance and release. You could be there a while.

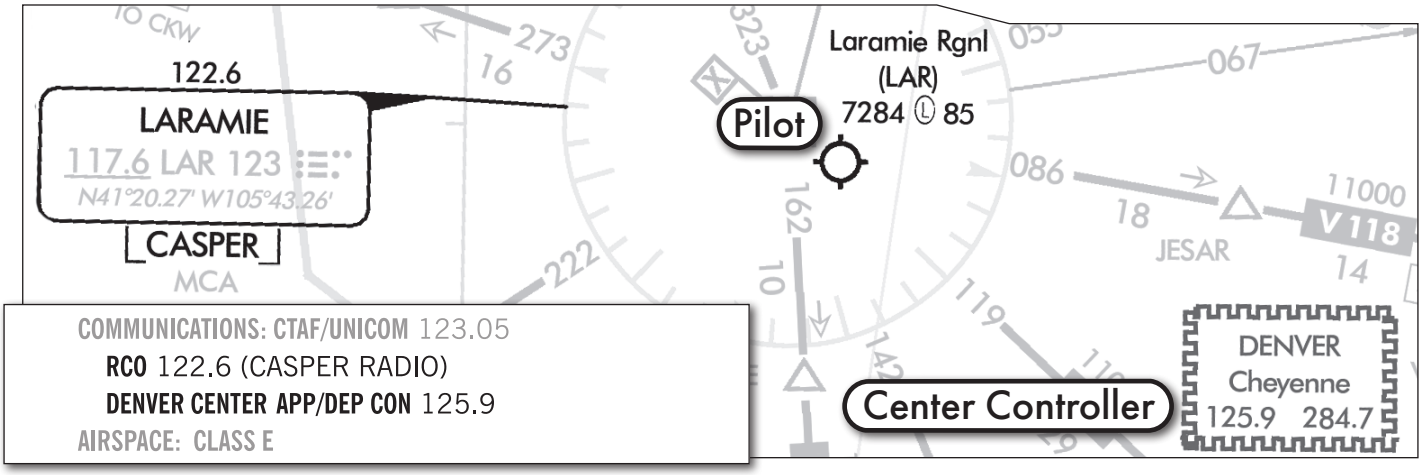
If you can't reach ATC via a dedicated clearance delivery frequency, you might—*might*—be able to reach an Approach or Center controller from the ground. The advantage is that you're still talking directly to ATC, so working out route issues or the release window you want is easier than through Flight Service (page 42). You can find these frequencies in the Chart Supplement, or by taking a guess from the frequencies shown on the Enroute or even Sectional Charts. If it doesn't work, the same sources may list an RCO to let you contact flight service.

The controller isn't expecting you to call directly, and is working other aircraft. If the frequency is busy, say where you are, that you're still on the ground, and add "... request" ①. When things are quiet, you can combine ① and ③ in one transmission.

After that the format is identical to calling an ATC clearance delivery frequency (page 38).

The controller working your local airspace can often release you right after you get your clearance, but just like with towered airports, you could get a hold for release ⑨. (See "The Difference Between a Clearance and a Release" on page 28.) A release is trickier at a non-towered airport because of the one-in/one-out requirement. If there's another IFR aircraft on approach to the airport, or even a nearby airport in some cases, you can't be released until they cancel IFR or report on the ground. If it will be more than a few minutes, the controller should tell you how long a delay to expect.

Laramie Regional Airport (KLAR)
Laramie, WY
Denver Center 125.9



(7) CENTER CONTROLLER
Cirrus Eight Eight Seven Two Bravo, cleared to Casper Natrona County International Airport as filed. Climb and maintain one two thousand. Departure frequency one two five point niner, squawk three six two four. Hold for release.

Because you're departing a fairly remote airport, the controller isn't concerned about you climbing into other traffic before you get on radar and he or she can assume traffic separation.

If this example was in a more congested area, your release (11) would have included a heading to fly or direct to a fix that went into effect "upon entering controlled airspace" or "upon reaching [altitude]." This phraseology is also common when you depart VFR and then get in contact with ATC below their MVA / MIA (page 47 or page 54).

What happens if you don't get a vector as you climb out and you were given no route? What if you go lost comm? You fly the departure you planned and join your cleared route at your cleared altitude.

(8) PILOT
Cirrus Eight Eight Seven Two Bravo, cleared to Casper Natrona County International Airport as filed. Maintain one two thousand. Departure one two five point niner, squawk three six two four. Hold for release.

(9) CENTER CONTROLLER
Cirrus Seven Two Bravo, readback correct. Expect a one zero minute departure delay.

(10) PILOT
We'll be waiting and ready when you are. Cirrus Seven Two Bravo.

After just six minutes ...

(11) CENTER CONTROLLER
Cirrus Eight Eight Seven Two Bravo, released for departure. Clearance void if not off by two zero one zero Zulu. If not off by two zero one zero Zulu, advise Denver Center not later than two zero two five Zulu of intentions. Time now two zero zero five Zulu.

(12) PILOT
Cirrus Eight Eight Seven Two Bravo is released. Clearance void if not off by two zero one zero Zulu.

CALLING ATC ON THE PHONE

Chart Supplement listings for hundreds of U.S. airports are being updated to include phone numbers for Clearance Delivery. You can call one of these numbers directly to cut out the middle man (FSS), and get your clearance directly from ATC. Check the Chart Supplement to see if one is available for the airport you're departing from. Note these are different phone numbers than the general facility numbers listed in the Chart Supplement under "FAA Telephone Numbers."

The controller you'll reach is working a position called "flight data," and handling clearances is this controller's job, That said, controllers are generally a bit busier than FSS specialists, so just like on the radio, don't expect a relaxed conversation. This works best from the end of the runway, waiting to depart. Call it a good excuse to buy that Bluetooth headset you've been pining for.

LAKER NDB (MHW) 332 LBH N45°32.46′ W122°27.74′ 063° 2.6 NM to fld. 125/16E. SHUTDOWN.
COMM/NAV/WEATHER REMARKS: Frequency 121.5 not avbl at twr. For Clnc Del ctc P80 Apch at 503–493–7545.

Request an IFR Clearance at a Non-Towered Airport (via FSS Radio)

① PILOT
Wichita Radio, Cirrus Eight Eight Seven Two Bravo, at Atkinson Airport—Kilo Papa Tango Sierra—on the Pittsburg RCO.

② FLIGHT SERVICE SPECIALIST
Cirrus Eight Eight Seven Two Bravo, Wichita Radio.

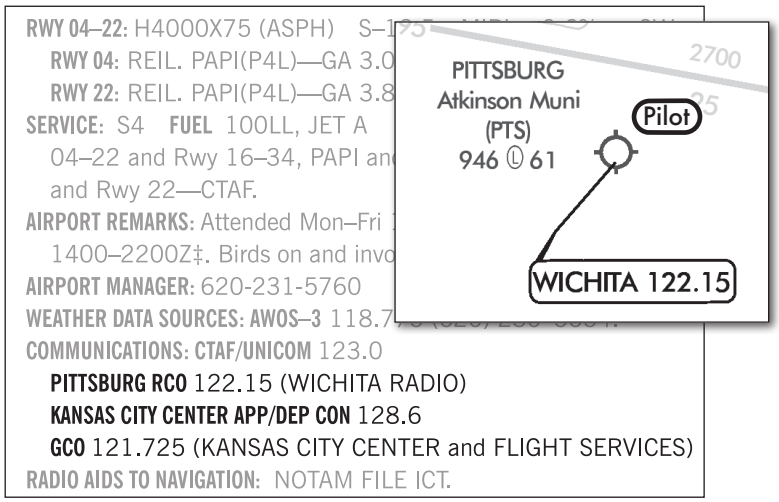
③ PILOT
Cirrus Eight Eight Seven Two Bravo, is on the ground at Atkinson. Request IFR clearance to Jefferson City—Kilo Juliet Echo Foxtrot.

④ FLIGHT SERVICE SPECIALIST
Cirrus Eight Eight Seven Two Bravo, roger. What runway will you depart, and how soon will you be ready?

⑤ PILOT
It'll be Runway Three Four, and we're ready to depart right now.

⑥ FLIGHT SERVICE SPECIALIST
Cirrus Eight Eight Seven Two Bravo, roger. Standby.

Atkinson Municipal Airport (KPTS)
Pittsburg, KS
Wichita Radio (Pittsburg RCO) 122.15



Some non-towered airports offer a whole menu of choices for getting your IFR departure clearance. The Chart Supplement listing for Atkinson Municipal Airport (KPTS) shows frequencies for Kansas City Center, the Wichita Flight Service Station via the Pittsburg RCO, and a GCO for both facilities. We've already said calling Kansas City Center over the radio is the first choice.

Presuming they didn't answer, the next best would be Flight Service over the RCO. (See below for the difference between an RCO and GCO, as well as why the RCO is preferable.)

REMOTE COMMUNICATIONS FACILITIES: RCO VERSUS GCO

When you look at the Chart Supplement listing for a non-towered airport and see a frequency for Center or Approach, that's the frequency and facility for the nearest transmitter to the airport. There's no guarantee they can hear you on the ground.

When you see a frequency for a Flight Service Station that's labeled "RCO," it's a "Remote Communications Outlet." This is a remote radio for Flight Service, and you should be able to contact them from the airport if the RCO is listed. Be sure to include the RCO name on your initial call. Flight Service specialists monitor a lot of locations. You can also use an RCO in the air in the vicinity of the airport to contact Flight Service.

RCOs shouldn't be confused with Ground Communication Outlets, or GCOs. GCOs are only for use on the ground, and use clicks of your mic to control a phone link that calls Flight Service, ATC, or both. GCOs have a reputation for being flaky and frustrating.

If you have cell reception, just call Flight Service or the ATC facility directly.

After a few minutes ...

⑦ FLIGHT SERVICE SPECIALIST
Cirrus Eight Eight Seven Two Bravo, Wichita Radio. I have your clearance. Advise when ready to copy.

⑧ PILOT
Ready to copy. Cirrus Eight Eight Seven Two Bravo.

⑨ FLIGHT SERVICE SPECIALIST
ATC clears Cirrus Eight Eight Seven Two Bravo from the Atkinson Airport to the Jefferson City Memorial Airport as filed. Maintain five thousand. Departure frequency will be one two eight point six, squawk four three three two. ATC releases Cirrus Eight Eight Seven Two Bravo. Clearance void if not off by zero zero two zero. If not off by zero zero two zero, advise ATC no later than zero zero three five. Time now zero zero one four.

⑩ PILOT
ATC clears Cirrus Eight Eight Seven Two Bravo from Atkinson to Jefferson City as filed. Maintain five thousand. Departure on one two eight point six, squawk four three three two. Released for departure. Clearance void at zero zero two zero. If not off by zero zero three five, we'll advise.

⑪ FLIGHT SERVICE SPECIALIST
Cirrus Eight Eight Seven Two Bravo, readback correct. You do have adverse conditions, Tango AIRMET, primarily high-altitude turbulence. Showing no adverse NOTAMs affecting you, and no TFRs over that route of flight. Details upon request, pilot reports appreciated. Monitor Atkinson automated weather for current altimeter. You have a good flight.

⑫ PILOT
Roger. Cirrus Eight Eight Seven Two Bravo.

The format of an initial call to Flight Service is always the same, no matter what your request:

> [Name of FSS Region] Radio, [Full call sign], [Name of remote station or aircraft location], [Frequency used for transmission (optional)].

Specialists monitor dozens of frequencies and locations, so it can speed things up if you give them a clue. The request for your clearance has the format:

> [Full call sign], [Location], Request IFR clearance to [Destination}.

If this format appears a bit different than clearance requests from a controller, it is. The ATC format uses a structure appropriate for many types of calls. This format is a bit more efficient because calls to FSS are almost always requests. In practice, either format works in either situation. There's usually a wait between ⑥ and ⑦ while the specialist retrieves your clearance, but it might not be long.

The key difference in the clearance is the start, "ATC clears ..." and later, "... ATC releases ..." The specialist is a relay between you and ATC. The system usually works great. However, any problem with your clearance results in a back and forth in an IFR game of "telephone" to work it out. This is why it's preferable to get your clearance from ATC, if practical.

TIP

Some Flight Service specialists demand an exact readback of the clearance—no omissions or abbreviations no matter how logical or obvious. They want it on the recording that the information was relayed without any ambiguity.

Request an IFR Clearance at a Non-Towered Airport (via FSS Phone)

(1) FSS AUTOMATED PHONE SYSTEM
Welcome to the Leidos ATC clearance delivery line. To ensure your safety of flight once you are connected to a specialist, and to assure the most effective service, please speak clearly and provide the following information about your departure airport, and then about your destination airport: the airport name, the three or four letter identifier, and then the state where it is located. [ding-dong sound] *What state are you departing from, or processing a NOTAM for? You may enter the two-letter state abbreviation on your keypad or speak your response now.*

(2) PILOT
Washington State.

(3) FSS AUTOMATED PHONE SYSTEM
I think you said, "Washington State." Is that correct?

(4) PILOT
Yes.

(5) FSS AUTOMATED PHONE SYSTEM
One moment please while I connect you to a flight data specialist.

After enduring minutes of "relaxing music" ...

(6) FLIGHT SERVICE SPECIALIST
Leidos Flight Service.

(7) PILOT
Hi. Cirrus Eight Eight Seven Two Bravo, on the ground at Roche Harbor, Washington—Whiskey Alpha Zero Niner. Request IFR clearance to Portland-Troutdale—Kilo Tango Tango Delta. We'll be departing Runway Seven, but I can't get cell reception by the airplane, so I need a release time about thirty minutes after we get off the phone.

(8) FLIGHT SERVICE SPECIALIST
Okay ... So it's an IFR clearance request for Cirrus Eight Eight Seven Two Bravo, departing Roche Harbor airport in Roche Harbor, Washington, Whiskey Alpha Zero Niner, to Kilo Tango Tango Delta, the Portland-Troutdale Airport in Portland, Oregon, off Runway Zero Seven, and you're requesting a release time about thirty minutes from now. Is that all correct?

(9) PILOT
That is correct.

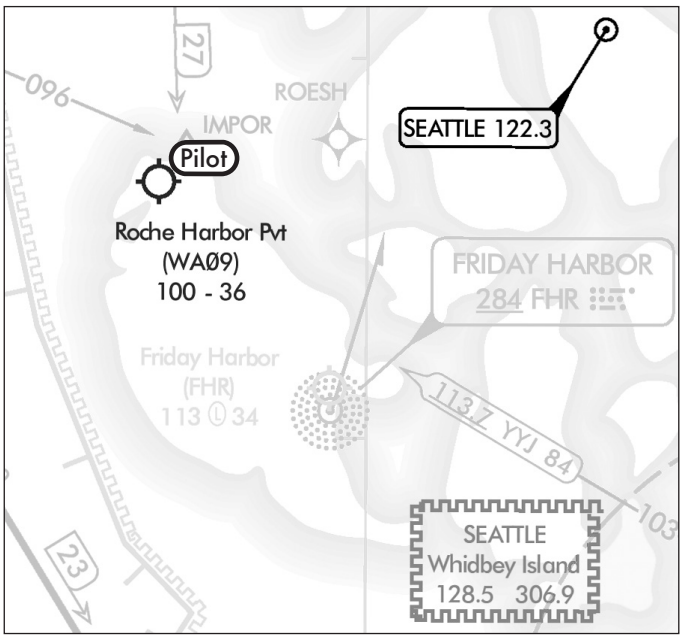
(10) FLIGHT SERVICE SPECIALIST
Okay. Lemme see what I can work out.

After a few minutes blissfully music free ...

(11) FLIGHT SERVICE SPECIALIST
Okay, sir. I have your clearance when you're ready.

(12) PILOT
Ready to copy.

(13) FLIGHT SERVICE SPECIALIST
ATC clears Cirrus Eight Eight Seven Two Bravo from the Roche Harbor Airport to the Portland-Troutdale Airport as filed. Maintain niner thousand. Departure frequency is one one eight point two, squawk four two six two. ATC releases Cirrus Eight Eight Seven Two Bravo, at one seven four zero Zulu. Clearance void if not off by one seven four five Zulu. If not off by one seven four five, advise ATC no later than one seven five zero. Time now one seven one zero.



⑭ PILOT
ATC clears Cirrus Eight Eight Seven Two Bravo from Roche Harbor Airport to Portland-Troutdale Airport as filed. Maintain niner thousand. Departure one one eight point two, squawk four two six two. Release at seventeen-forty Zulu. Clearance void if not off seventeen-forty-five Zulu. If not off, advise ATC no later than seventeen fifty Zulu.

⑮ FLIGHT SERVICE SPECIALIST
Cirrus Eight Eight Seven Two Bravo, readback correct. Do you need any updates on adverse conditions, NOTAMs, or weather?

⑯ PILOT
Negative.

⑰ FLIGHT SERVICE SPECIALIST
Alright then. Details upon request, pilot reports appreciated. Monitor Roche Harbor automated weather for current altimeter. Have a nice flight.

⑱ PILOT
Thanks.

Roche Harbor Airport (WA09)
Roche Harbor, WA
FSS Clearance Delivery 1-888-766-8267

Sometimes "IFR Communications" are best done on the phone. If you can't reach ATC directly (such as calling Seattle Center on 128.5), can't find a published phone number (See "Calling ATC on the Phone" on page 41), or can't reach Flight Service via an RCO (Seattle Radio on 122.3) or over a VOR, then it's time to call Flight Service on the phone.

You can call the general Flight Service number of 800-WX-BRIEF (800-992-7433), but a better choice is the dedicated ATC Clearance Delivery line: 888-766-8267. Enjoy the detailed introduction ①, or hit any key on your phone to skip it. Next, say the name of the state you're departing from ② (or enter the two-letter ID), so the system can connect you to a specialist who works that area.

Once a specialist answers ⑥, it's no different than making the request via radio (page 42). Just like when you get a clearance and release by any method from an uncontrolled airport, it's best if you're ready to depart. Clearly this requires a cell phone and reasonable reception, but that doesn't always work out ⑦, so you might want to make a test call from the end of the runway before you taxi out there and discover you have no cell reception.

The alternative—finding just the right spot for cell coverage or using a pay phone from 1983 bolted to the side of a building—means getting your clearance before you even start the engine. In this case, negotiate a release time in the future ⑦. Flight service will include both when your release window opens and when it closes ⑬. It might not be long, so make sure it gives you enough time to jog across the ramp, get the plane started, taxi to the runway, and do a run-up—all before your void time.

TIP

Don't have a Bluetooth headset? Plug earbuds into your phone and tuck them inside your headset. Then make the call. Works for music, too.

Announce Takeoff and Contact Departure

① PILOT
Storm Lake Traffic, Cirrus Eight Eight Seven Two Bravo, departing Runway One Seven, straight-out departure. Storm Lake.

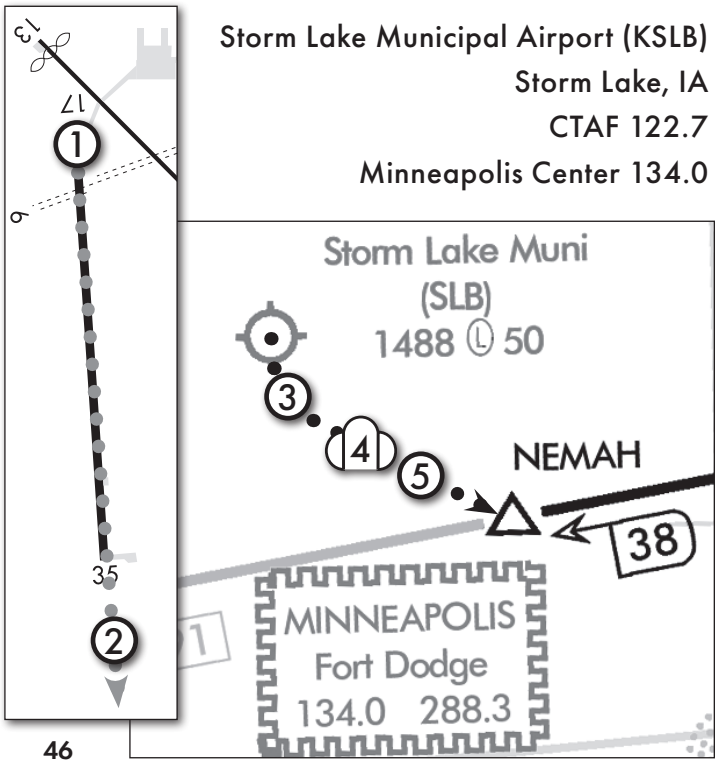
② PILOT
Storm Lake Traffic, Cirrus Eight Eight Seven Two Bravo, upwind, departing the pattern to the south. Storm Lake.

Climbing through 1000 feet ...

③ PILOT (on 134.0)
Minneapolis Center, Cirrus Eight Eight Seven Two Bravo, off Storm Lake, one thousand climbing to three thousand.

④ CENTER CONTROLLER
Cirrus Eight Eight Seven Two Bravo, Ident. Storm Lake altimeter two niner niner three.

⑤ PILOT
Ident. Two niner niner three. Cirrus Eight Eight Seven Two Bravo



Storm Lake Municipal Airport (KSLB)
Storm Lake, IA
CTAF 122.7
Minneapolis Center 134.0

⑥ CENTER CONTROLLER
Cirrus Eight Eight Seven Two Bravo, Radar contact three miles south of Storm Lake Airport. Say altitude leaving.

⑦ PILOT
Passing two thousand two hundred, Cirrus Eight Eight Seven Two Bravo.

Without a control tower, you taxi to the departure runway (page 25), and get your clearance and release on your own (page 38–page 44). Look and listen for any VFR traffic on CTAF. Even if it's IMC and you think there's nobody else around, make the traffic calls anyway. Daytime Class G cloud clearances can be one mile visibility and clear of clouds. The format is the same as if you were VFR ①:

> [Airport Name] Traffic, [Call sign] Departing [Runway name], [Direction of departure]. [Repeat Airport Name].

State the runway number rather than "Taking the active." If you're still in visual conditions when you would make a second position report under VFR, do so ②. Otherwise, skip this call. (You have an IFR clearance and release, so you're free to enter the clouds the moment your wheels leave the ground.)

Next, call Departure on the frequency that was in your clearance ③. The format is:

> [Departure Facility], [Full call sign], [Current Altitude] climbing [Cleared Altitude].

If the controller sees your target on the scope, you'll hear "radar contact." Presuming the altitude the controller sees matches what you report ③, that may be all you hear. You're still responsible for your own separation from terrain and obstructions, unless the controller issues a vector (page 47).

Without such a vector, fly the ODP, VCOA, or other departure you planned to join your cleared route (direct NEMAH here) and continue to your destination.

① PILOT
Oxford Traffic, Cirrus Eight Eight Seven Two Bravo, departing Runway One Five, straight-out departure. Oxford.

Vectors from ATC are the backbone of air traffic control these days, but that's only possible when the aircraft is above the controller's MVA/MIA or certain additional conditions are met (See "Minimum Vectoring and Instrument Altitude (MVA/MIA)" on page 48.) If those conditions are met, ATC can issue a vector even though you're still at low altitude.

Controllers know which airports in their airspace have good radar coverage, but ATC can't—by definition—issue a clearance in Class G (uncontrolled) airspace. Any instruction must include the phrase "Upon entering controlled airspace." It's possible to get a heading, "Enter controlled airspace heading 230 ...", but that is still after you've flown any ODP.

Neither of those instructions are vectors. They're clearances that go into effect once you're in controlled airspace. You're still responsible for navigation and terrain clearance. The Runway 15 ODP is heading 149 to 1300 feet. Presuming you reach 1300 feet at about call ④,you can proceed on course, which is direct NOTTY.

The controller can't even see you yet. You know that because there's no "radar contact" in call ⑤. Even when there is ⑦, and an altitude is issued, ATC is only separating you from other IFR traffic. You're still on the hook for obstacles and terrain as you join your cleared route. If ⑦ had included a heading to fly, *then* ATC is taking over for terrain clearance as well.

② PILOT (on 125.5)
Portland Approach, Cirrus Eight Eight Seven Two Bravo, off Oxford. One thousand two hundred climbing eight thousand.

③ APPROACH CONTROLLER
Cirrus Eight Eight Seven Two Bravo, Portland Approach, Portland altimeter two eight niner one.

④ PILOT
Two eight niner one, and we're direct NOTTY now, Cirrus Eight Eight Seven Two Bravo.

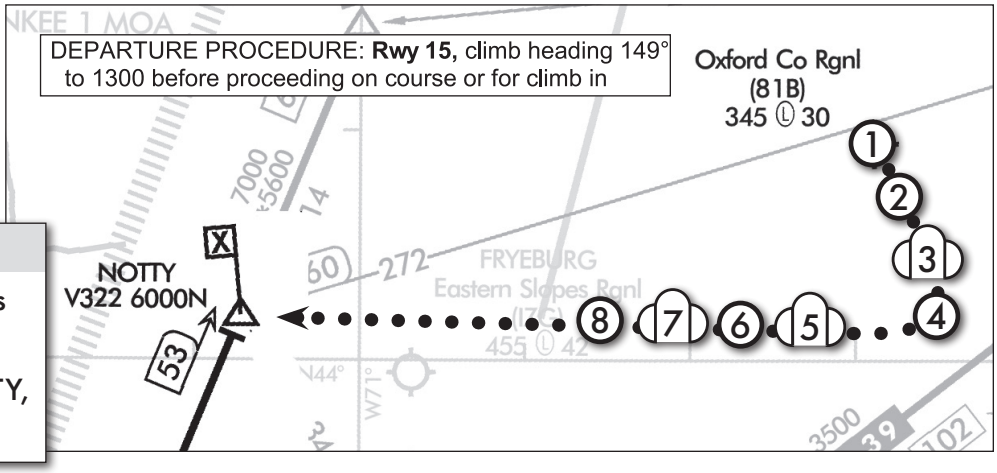
⑤ APPROACH CONTROLLER
Cirrus Seven Two Bravo, ident and say altitude.

⑥ PILOT
Passing two thousand four hundred, Cirrus Seven Two Bravo.

⑦ APPROACH CONTROLLER
Cirrus Seven Two Bravo, radar contact, three miles south of the Oxford airport, climb and maintain one zero thousand.

⑧ PILOT
Climb and maintain one zero thousand. Cirrus Seven Two Bravo.

Oxford County Rgnl (81B)
Oxford, ME
CTAF 122.8
Portland Approach 125.5



IFR CLEARANCE

... cleared to Albany Airport as filed, upon entering controlled airspace, proceed direct NOTTY, climb and maintain 8000 ...

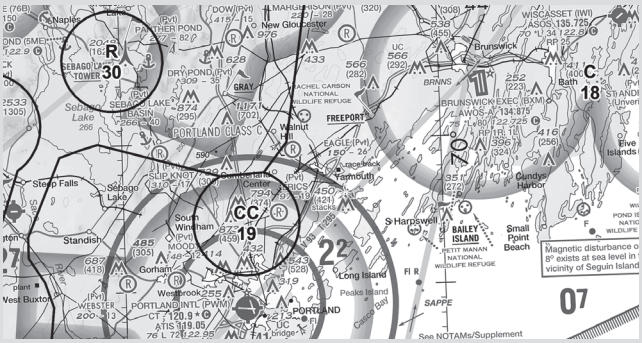
MINIMUM VECTORING AND INSTRUMENT ALTITUDE (MVA/MIA)

Your route and altitude under IFR falls into one of two categories: Either you're responsible for determining the course you should fly and how high you must be, or a controller assigns you a heading and altitude. The latter category is called a vector.

When a controller issues a vector—"Fly heading two three zero, climb and maintain four thousand"—that controller takes responsibility for your aircraft's terrain and obstacle clearance. The controller can't do that unless you're high enough above the obstacles—which is the MVA/MIA.

In general, the lowest altitude a controller can issue a vector depends on the Minimum Vectoring Altitude (MVA) or the Minimum Instrument Altitude (MIA). MVAs are used by TRACONs (Approach) and MIAs are used by ARTCCs (Center). TRACONs have more precise radar, often with better coverage and subsequently lower altitudes for vectors.

Each controller's radar scope can depict the MVAs or MIAs as areas where a single minimum altitude applies. These areas are also published for pilots, but without reference to a chart, so they aren't particularly helpful. If you get creative with

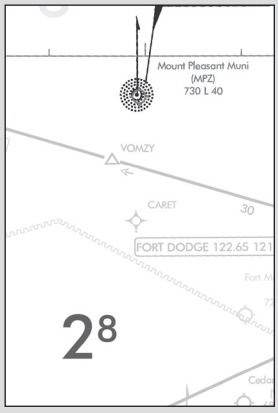


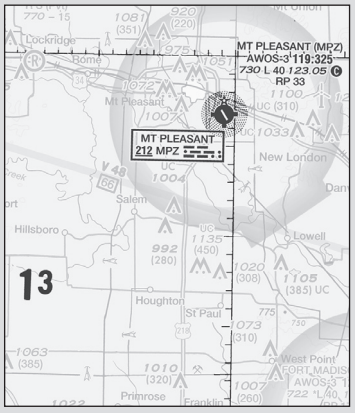
Photoshop, you can overlay one on the other and figure it out. Or, you can ask for a tour of your local ATC facility, where they might have it hanging on the wall. If you see one, you'll note the MVAs and MIAs don't correlate to MEFs or OROCAs (see below), which is why you might get vectors at altitudes lower than you expected.

There are situations where a controller can issue a vector to an aircraft below the MVA or MIA. One is if a Diverse Vector Area (DVA) has been established for a specific airport. The DVA provides safe sectors departing certain airports and allows vectors soon after takeoff. Another allowance is sometimes made when the aircraft is within 40 NM of the antenna for a TRACON.

THE DIFFERENCE BETWEEN MEF AND OROCA

Most pilots learn about Sectional Chart Minimum Elevation Figures (MEFs) during their Private Pilot training. These help gauge obstacle clearance by showing the lowest altitude at which an aircraft would pass above the highest obstacle in the map quadrant. The clearance isn't much; it could be as little as 100 feet.





Enroute charts have an analogous number: The Off-Route Obstruction Clearance Altitude (OROCA). The astute reader will catch that OROCAs are far higher than their accompanying MEFs. OROCAs comply with FAR 91.177, which says the aircraft must be 1000 feet above the highest obstacle within four NM either side of the course to be flown (2000 feet in mountainous regions). Therefore, every OROCA will be at least 1000 or 2000 feet higher than the MEF for the same quadrant.

However, because the OROCA must allow for that four NM distance left or right of course, the area evaluated for the OROCA extends four miles beyond the quadrant on all sides. A tall obstacle just outside a quadrant won't raise an MEF, but it will raise an OROCA. There are also four Sectional Chart quadrants for each Enroute Chart quadrant.

① PILOT
Phoenix Approach, Cirrus Eight Eight Seven Two Bravo, on the ground at Sedona. Request IFR clearance to Daggett, Kilo Delta Alpha Golf.

② APPROACH CONTROLLER
Cirrus Eight Eight Seven Two Bravo, cleared to Daggett via OATES ONE departure then as filed. Climb and maintain one two thousand squawk five five five two. Hold for release.

③ PILOT
Cirrus Eight Eight Seven Two Bravo cleared ... Hold for release.

If there's an aircraft on approach to the non-towered airport you're trying to depart, you can't get an IFR release. One solution is departing VFR to pick up your clearance in the air (page 52). However, if you receive your clearance and *then* find out your release is on hold ④, you can't depart without permission.

The best fix is requesting a VFR departure ⑤. If approved, you make your normal traffic calls, and contact ATC once in the air (page 46).

Conditions must be good enough to remain VFR. You must avoid other aircraft, select your route, and maintain obstacle clearance until you receive an assigned IFR altitude ⑨. This differs from a vector because there's no heading to fly. Once you receive that altitude, you may continue under IFR and enter the clouds. ATC may confirm with "Consider yourself IFR at this time ..." ⑨, or not. ATC has assumed traffic avoidance; obstacle avoidance is still your responsibility, however, unless the controller issued a vector with a heading or direct to a fix.

ATC willingness to do this varies with facility. Some have you squawk 1200, or a temporary code, for the VFR climb. Others just refuse. Worst-case: Cancel IFR and tell ATC to keep your flight plan. Depart VFR and get your clearance in the air.

This technique works best when talking directly to Departure or Center on the ground, but it is possible to relay the request through FSS.

④ APPROACH CONTROLLER
Cirrus Seven Two Bravo, readback correct. It may be a few minutes, I've got a Cessna inbound on the GPS Runway Three Approach.

⑤ PILOT
Phoenix Approach, Cirrus Seven Two Bravo, request VFR departure.

⑥ APPROACH CONTROLLER
Cirrus Seven Two Bravo, VFR departure approved. Maintain VFR. Report airborne on this frequency.

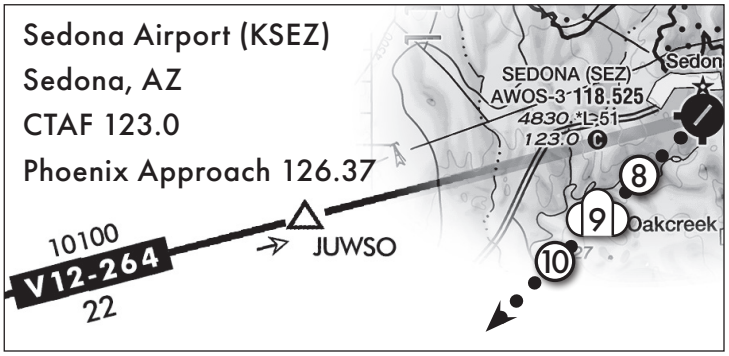
⑦ PILOT
VFR departure approved, report airborne. Cirrus Seven Two Bravo.

After departing Sedona VFR with CTAF calls...

⑧ PILOT
Phoenix Approach, Cirrus Eight Eight Seven Two Bravo, off Sedona, six thousand.

⑨ APPROACH CONTROLLER
Cirrus Seven Two Bravo, radar contact seven miles south of Sedona. Consider yourself IFR at this time, climb and maintain one two thousand.

⑩ PILOT
Climb and maintain one two thousand, Cirrus Seven Two Bravo.



Request an IFR Clearance (with ODP or VCOA)

① PILOT
Cascade Approach, Cirrus Eight Eight Seven Two Bravo, on the ground at Corvallis, IFR to Richland, Washington. We'll be departing Runway Three Five, and making the visual climb over the airport. Request clearance.

② APPROACH CONTROLLER
Cirrus Eight Eight Seven Two Bravo, standby.

After a couple minutes ...

③ APPROACH CONTROLLER
Cirrus Eight Eight Seven Two Bravo, cleared to the Richland Municipal Airport as filed. Climb and maintain niner thousand. Departure frequency one two seven point five, squawk two three six seven. Hold for release.

④ PILOT
Cirrus Eight Eight Seven Two Bravo is cleared to ... squawk two three six seven. Hold for release.

⑤ APPROACH CONTROLLER
Cirrus Eight Eight Seven Two Bravo, readback correct. Which runway are you departing again, and when will you be ready to depart?

⑥ PILOT
We're ready right now, and we'll be departing Runway Three Five, Cirrus Eight Eight Seven Two Bravo.

⑦ APPROACH CONTROLLER
Cirrus Eight Eight Seven Two Bravo, released for departure. Clearance void if not off by two zero one five Zulu. If not off by two zero one five Zulu, advise Cascade Approach no later than two zero two five Zulu. Time now is two zero zero niner Zulu.

⑧ PILOT
Cirrus Eight Eight Seven Two Bravo is released. Clearance void if not off by two zero one five Zulu. If not off by two zero one five, we'll advise Approach no later than two zero two five Zulu. Thanks.

Corvallis Municipal Airport (KCVO)
Corvallis, OR
Cascade Approach 127.5

TIP

Cold-calling ATC with an entire request ① can work on a quiet frequency, but you might have to repeat some of it anyway ⑤. It's usually better to break the call into two parts: Where you are plus "request," and then the details after they reply.

The Visual Climb Over Airport (VCOA) is an alternative to the ODP when you can't meet the ODP's required climb gradient (350 feet per NM off Runway 35 at KCVO). You can fly the VCOA if the ceiling and visibility are at least what's specified in the Takeoff Minimums (3300 feet AGL and three SM for Runway 35). VCOAs have no climb gradient while you're visual and require only 200 feet per NM once you enter the clouds.

Take off and climb in visual conditions to cross CVO VOR/DME at or above 3400 feet MSL, and then proceed on instruments as you continue to climb on course (page 51).

You can request a VCOA out of a towered airport from Tower before you depart, but they're more common at non-towered fields. You must tell ATC you're planning to fly the VCOA, so let them know when you request your clearance ①, or have the briefer pass on the message if you request your clearance via Flight Service.

TAKEOFF MINIMUMS: **Rwy 9,** std. w/min. climb gradient of 270' per NM to 2900 or 3300-3 for VCOA. **Rwy 35,** std. w/min. climb gradient of 350' per NM to 3100 or 3300-3 for VCOA.

① PILOT
Corvallis Traffic, Cirrus Seven Two Bravo, departing Runway One Seven, making left turnout to spiral up over the airport. Corvallis.

② PILOT
Corvallis Traffic, Cirrus Seven Two Bravo, crossing over the airport east to west, climbing through nine hundred feet, spiraling up over airport. Corvallis.

③ PILOT (on 127.5)
Cascade Approach, Cirrus Eight Eight Seven Two Bravo, one thousand one hundred making visual climb over airport at Corvallis.

④ DEPARTURE CONTROLLER
Cirrus Eight Eight Seven Two Bravo, Cascade Departure. You're still below my radar out there. Report turning on course.

⑤ PILOT
Report on course, Cirrus Eight Eight Seven Two Bravo.

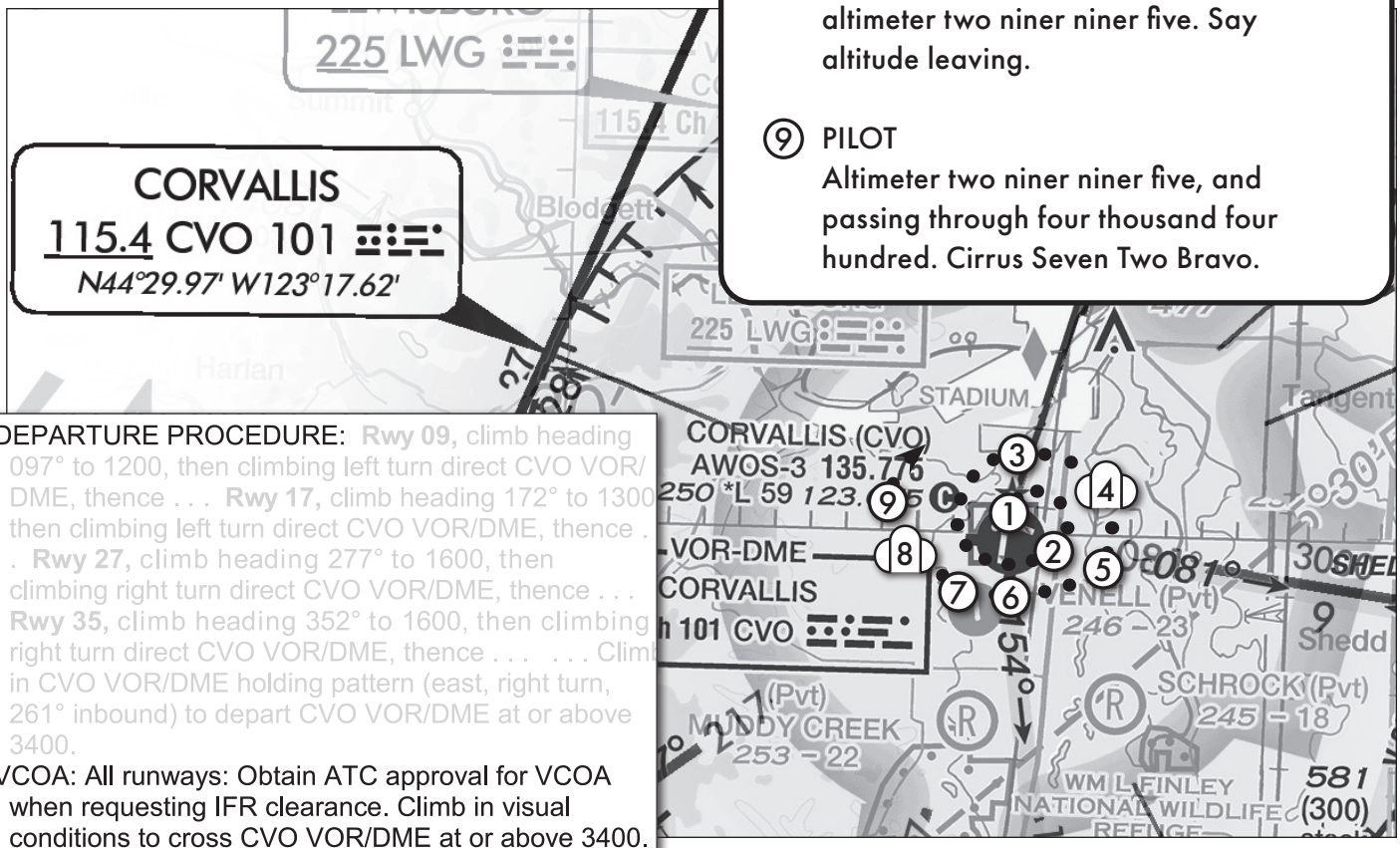
⑥ PILOT (on 123.075)
Corvallis Traffic, Cirrus Seven Two Bravo, over the center of airport at two thousand. Climbing over the airport. Corvallis.

⑦ PILOT (on 127.5)
Cascade Approach, Cirrus Eight Eight Seven Two Bravo, departing Corvallis to the west.

⑧ DEPARTURE CONTROLLER
Cirrus Seven Two Bravo, radar contact one mile west of Corvallis. Corvallis altimeter two niner niner five. Say altitude leaving.

⑨ PILOT
Altimeter two niner niner five, and passing through four thousand four hundred. Cirrus Seven Two Bravo.

Corvallis Municipal Airport (KCVO)
Corvallis, OR
CTAF 123.075
Cascade Approach 127.5



Request IFR Clearance for Filed Flight Plan in the Air

① PILOT
Boston Center, Cirrus Eight Eight Seven Two Bravo, Gardner VOR, request.

② CENTER CONTROLLER
Cirrus Eight Eight Seven Two Bravo, Boston Center. Say request.

③ PILOT
Cirrus Eight Eight Seven Two Bravo, VFR five miles southeast of Gardner at niner thousand. We have an IFR flight plan on file to Rochester. Request clearance.

④ CENTER CONTROLLER
Cirrus Eight Eight Seven Two Bravo, roger. Maintain VFR. Squawk three six seven one and ident.

⑤ PILOT
Maintain VFR, squawk three six seven one and ident. Cirrus Eight Eight Seven Two Bravo.

There are two primary scenarios that put you in the air with an IFR flight plan on file, but no IFR clearance. One is that departure airport was non-towered and you were unable to get your clearance on the ground, but conditions were visual, so you departed under VFR. The other is that you planned to switch from VFR to IFR halfway through your trip to avoid complex IFR routings or altitude limitations until weather or other needs made that impossible. This scenario is different from getting your IFR clearance on the ground, and then requesting VFR departure to avoid waiting for an IFR release (page 49).

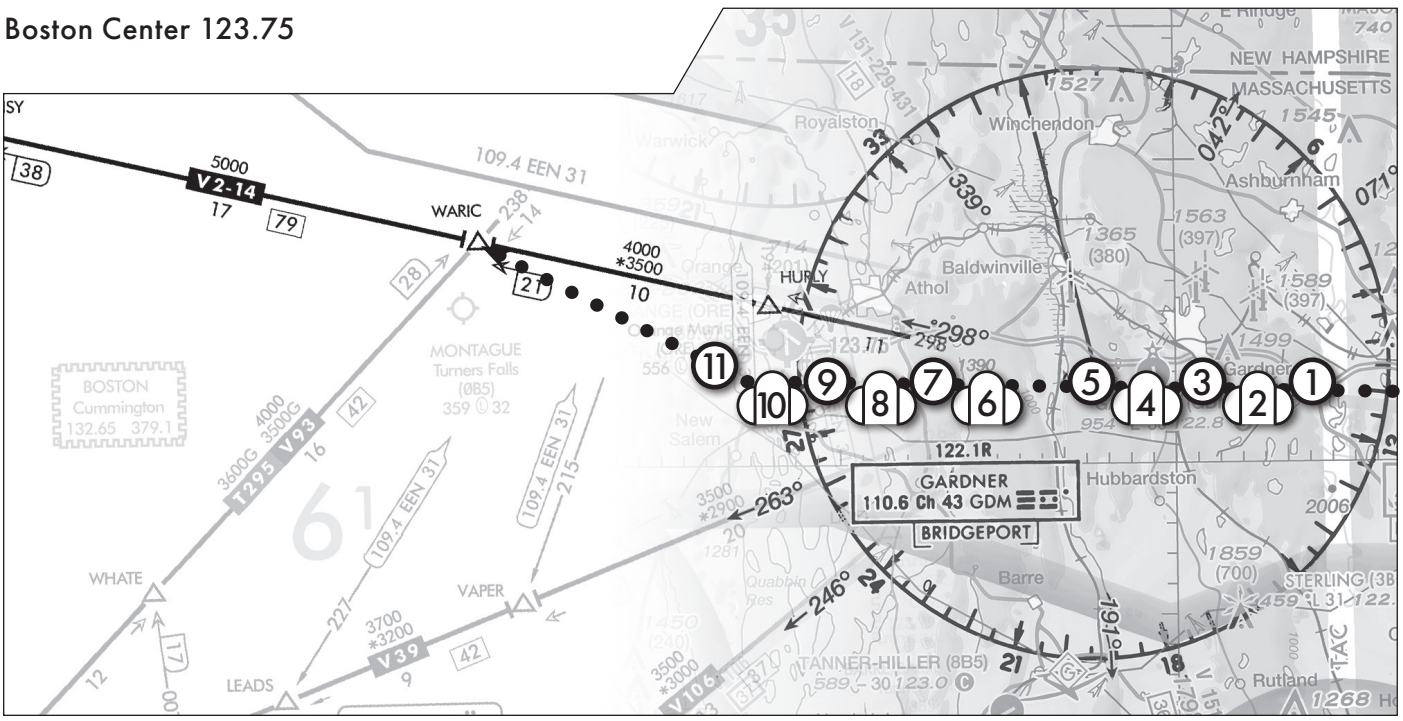
No matter how you got into cruise flight, the way to get your clearance is contacting ATC directly. If you're on VFR flight following and the controller is showing off, he or she may even offer that there's an IFR flight plan on file for you, and ask if you want it.

Because you have an IFR flight plan on file, ATC is expecting you. Even so, checking in with a request ①, is a heads up you'll be asking for something that takes a bit of time.

TIP

An IFR flight plan doesn't have to begin (or end) at an airport. The departure point could be an intersection, VOR, waypoint, or even a lat/long.

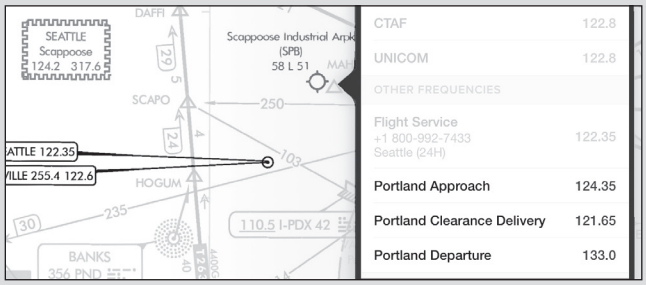
Gardner VOR (GDM)
Gardner, MA
Boston Center 123.75



FINDING THE RIGHT FREQUENCY FOR ATC

The toughest part about contacting ATC when airborne can be figuring out which frequency to try. If you're above 10,000 feet MSL, you probably need to speak with Center. These frequencies are in blue scalloped boxes on the Enroute Chart.

If you're below 10,000 feet, it might still be Center, or it might be Approach. To find out, tap your tablet moving map on the nearest airport to your location, use waypoint information from your GPS, or reference the Chart Supplement. Any of those should have the frequency. You can call Flight Service, as well, give them your location, and let them look it up for you.



If the frequency is quiet, you could combine ① and ③ in a single call. The format of a single call would be:

> [Facility name], [Full call sign], [Location] and [Altitude], We have an IFR flight plan on file to [Destination], request clearance.

It's important to state you have an IFR flight plan on file, because it's possible to create an IFR flight plan and get a clearance directly from ATC without anything on file. This is a "Pop-up" IFR clearance (page 124). Pop-ups are easier, as you don't have to file a flight plan beforehand. However, they are done on a workload permitting basis, so the controller could say, "Unable IFR clearance at this time." If you're already filed, you're in the system and your slot is already reserved.

In this example, you're high enough that the controller can give you your clearance ⑧, and issue vectors ⑩. If you had been below the MVA/MIA (see "Minimum Vectoring and Instrument Altitude (MVA/MIA)" on page 48), you might have heard the question: "Can you maintain your own terrain and obstacle clearance until reaching [altitude]?" If you say, "yes," you can get the clearance—and enter the clouds—but you're responsible for avoiding all obstacles until on a published route or ATC vector.

Giving an IFR clearance takes time on frequency (especially if a full-route clearance is required), so be prepared to remain VFR until you get a clearance and can proceed IFR along your cleared route. Note that the frequency is omitted from your clearance because you're already tuned to it, and the transponder code is omitted because you're already squawking it ⑧.

After the controller works other airplanes ...

⑥ CENTER CONTROLLER
Cirrus Seven Two Bravo, radar contact six miles west of Gardner. Advise when ready to copy.

⑦ PILOT
Ready to copy. Seven Two Bravo.

⑧ CENTER CONTROLLER
Cirrus Eight Eight Seven Two Bravo, cleared to the Greater Rochester airport. Gardner, Victor Two, Albany, direct. Climb and maintain one two thousand.

⑨ PILOT
Cleared to Greater Rochester. Gardner, Victor Two, Albany, direct. Climb and maintain one two thousand. Cirrus Eight Eight Seven Two Bravo.

⑩ CENTER CONTROLLER
Cirrus Eight Eight Seven Two Bravo, readback correct. Proceed direct WARIC, join Victor Two, then resume own navigation. Fitchburg altimeter two niner niner five.

⑪ PILOT
Direct WARIC. Join Victor Two then own navigation. Altimeter two niner niner five. Cirrus Eight Eight Seven Two Bravo.

Request IFR Clearance for Filed Flight Plan in the Air (below MVA/MIA)

① PILOT
Harvey Traffic, Cirrus Seven Two Bravo, departing Runway Three Three Right, downwind departure. Harvey.

② PILOT (on 128.5)
Seattle Approach, Cirrus Eight Eight Seven Two Bravo, VFR off Harvey Field, looking for our IFR clearance to Medford, Oregon.

③ APPROACH CONTROLLER
Cirrus Seven Two Bravo, Seattle Approach, can you maintain your own terrain and obstacle clearance to three thousand feet?

④ PILOT
Affirmative. Cirrus Seven Two Bravo.

⑤ APPROACH CONTROLLER
Cirrus Eight Eight Seven Two Bravo, cleared to the Medford Airport as filed, climb and maintain five thousand, leaving three thousand, fly heading two zero zero, report leaving three thousand, squawk two two five five.

⑥ PILOT
Cleared to the Medford airport as filed. climb and maintain five thousand, leaving three thousand, fly heading two zero zero, report leaving three thousand, squawk two two five five. Cirrus Eight Eight Seven Two Bravo.

⑦ APPROACH CONTROLLER
Seven Two Bravo, readback correct. Seattle altimeter two niner niner one.

⑧ PILOT
Altimeter two niner niner one, and we're leaving three thousand, Cirrus Eight Eight Seven Two Bravo.

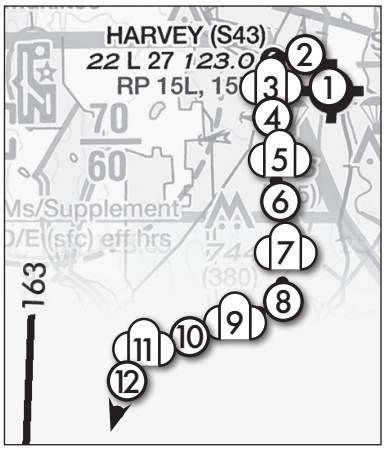
⑨ APPROACH CONTROLLER
Cirrus Seven Two Bravo, ident and say altitude.

⑩ PILOT
Three thousand seven hundred, Cirrus Seven Two Bravo.

⑪ APPROACH CONTROLLER
Cirrus Seven Two Bravo, radar contact, five miles southwest of Harvey airport. Cleared direct Seattle.

⑫ PILOT
Direct Seattle, Cirrus Seven Two Bravo.

Harvey Field (S43)
Snohomish, WA
CTAF 123.0
Seattle Approach 128.5



If you depart VFR without a clearance and try to pick it up in the air, ATC may pose a question before issuing the clearance: "Can you maintain your own terrain and obstacle clearance to [altitude]?" ③.

This happens when you're below the controller's MVA/MIA, and he or she can't issue instructions at your current altitude. If you say "yes" ④, then the controller can issue you the clearance, probably with some instructions that go into effect when you get high enough ⑤. The difference between this scenario and the one on page 47 is in that situation you departed IFR, with a clearance and a release, but you were too low to get a vector from ATC right away. In this case, you're departing VFR—no clearance—so the phraseology is different.

If you know this question is coming, you can include this information in call ②: "Seattle Approach ... IFR clearance to Medford. *We can maintain our own terrain and obstacle clearance to three thousand.*"

V267 north of KPHK
Pahokee, FL
Palm Beach Departure 128.3
Miami Center 132.25

Each controller is responsible for a specific sector of airspace. When you're about to leave that airspace, the controller coordinates a "handoff" with the controller of the next sector. Once the new controller accepts your aircraft, your current controller tells you to contact the new one on their frequency ①.

Always acknowledge receipt of the new frequency before switching. Reading back the frequency ensures you heard it correctly ②, but you can just acknowledge with your call sign.

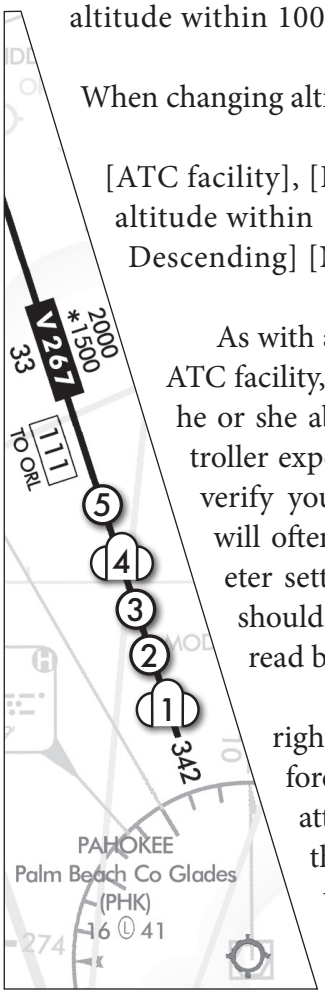
Change frequency as soon as practical to check in with the next controller (unless you're told to change frequency at a certain time, fix, or altitude).

The check-in format is:

[ATC facility], [Full call sign], [Current altitude within 100 feet]

When changing altitudes ③, the format is:

[ATC facility], [Full call sign], [Current altitude within 100 feet], [Climbing/Descending] [New altitude].



As with any first contact with a new ATC facility, use your full call sign until he or she abbreviates it. The new controller expects you, and only needs to verify your altitude. That controller will often supply an updated altimeter setting for you ④, which you should acknowledge, and could read back if you wish ⑤.

If you don't get a response right away, wait a moment before trying again. If multiple attempts don't work, return to the old frequency (it's still in the standby window, right?) and verify you had the correct frequency. Even if you did, there might be a reception issue. Your old controller might tell you to try again in a certain number of miles, or offer a different frequency that has better coverage where you're currently flying. When contacting a new controller, be prepared to receive a new or amended clearance. Each sector has its own traffic situation.

① DEPARTURE CONTROLLER
Cirrus Seven Two Bravo, contact Miami Center now one three two point two five.

② PILOT
Miami Center on one three two point two five. Cirrus Seven Two Bravo.

③ PILOT (on 132.25)
Miami Center, Cirrus Eight Eight Seven Two Bravo, seven thousand three hundred climbing niner thousand.

④ CENTER CONTROLLER
Cirrus Eight Eight Seven Two Bravo, Miami Center. Palm Beach altimeter two niner niner six.

⑤ PILOT
Two niner niner six. Cirrus Eight Eight Seven Two Bravo.

Sometimes, a controller will switch you to a different frequency because you're flying out of range of one station and into range of another. In that case, you'll hear something like, "Change to my frequency 127.65." The check-in might be, "Miami Center, Cirrus Seven Two Bravo on 127.65." There's no need to verify altitude because you're still on the same scope. You're only verifying two-way communication on the new frequency.

TIP

Whenever you change frequencies, *pause to listen* in case someone else just transmitted and ATC is about to respond. Transmit only after you hear a long moment of quiet air.

Receive a Change in Altitude

① CENTER CONTROLLER
Cirrus Seven Two Bravo, climb and maintain niner thousand. Expedite your climb through seven thousand. Traffic twelve o'clock, one seven miles, opposite direction, a Mooney at six thousand.

② PILOT
Leaving five thousand for niner thousand. Expedite through seven thousand. Cirrus Seven Two Bravo.

Changes of altitude while enroute are common. It could be a climb to reach your cruise altitude, a climb or descent to maintain separation from other traffic, or adjust for a new minimum altitude, or a descent to begin your arrival. The format you'll hear is:

> [Call sign], [climb/descend] and maintain [altitude].

Read it back and promptly climb or descend at an optimum rate for your aircraft. Technically, within 1000 feet of the new altitude you should fly between 500 and 1500 fpm. ATC doesn't police this—unless aircraft start getting close, and then they're acutely aware how fast you're climbing or descending. Also, if you can't maintain at least 500 fpm, you're supposed to notify ATC, although most controllers don't know pilots are required to report this.

If the controller says "expedite" (or sometimes "immediately," or "no delay") climb or descend as quickly as practical to avoid the development of an "imminent situation." The controller will likely say why, such as in ①, where the first part of the climb gets you 1000 feet above the opposite direction traffic.

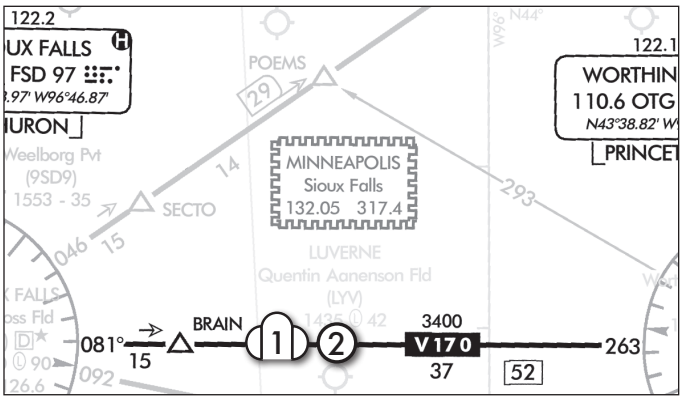
Clearance to climb or descend may include a crossing restriction. For example: "Cross Worthington at and maintain seven thousand." In this case, not only must you reach 7000 feet, you must do it by the time you cross the Worthington VOR.

If the clearance with a crossing restriction is for a climb, it's expected you'll start climbing immediately. However, if you're descending to an altitude with a crossing restriction, "pilot's discretion" is implied (see the sidebar on this page). Just ensure you do meet the crossing restriction.

Descent clearances can contain both cases, such as: "Cross Worthington at seven thousand, then descend and maintain five thousand." This is a pilot's discretion descent so long as the aircraft crosses Worthington at 7000, then a prompt descent to 5000.

If ATC issues a climb higher than you or your airplane are comfortable flying, don't hesitate to say, "Unable, that's too high for us." The same is true if you get a crossing restriction you're convinced you can't make, or a change of altitude that would put you in unacceptable weather, such as icing conditions. Use "unable" and state the reason why. Be prepared to negotiate an alternative. The controller had a reason for the altitude change that still must be attended to. ATC should never issue a descent below a safe altitude, but it's worth keeping track of where you are, and asking if you're concerned the new altitude will be too low.

Eastbound on V170 between FSD and OTG VORs
Luverne, MN
Minneapolis Center 132.05



CASUAL ALTITUDE CHANGES

A more flexible altitude assignment is, "Climb to reach [altitude] at [time / fix / waypoint]." The time could be Zulu (in which case the current time is given) or in minutes from now. So long as you reach the altitude by the time or position required, how quickly you make the change is up to you. A similar term is "at pilot's discretion" (page 76). Pilot's discretion is much more common with a descent.

Sometimes you want an altitude change. Maybe you're getting bounced around in turbulence, or you think the tailwinds will be better above (or the headwinds lesser below). Maybe you just want a better view. Whatever the reason, the format is:

> [ATC Facility], [Call sign], request ["higher," "lower," or altitude].

Note that you may request a specific altitude, or simply ask for "higher" or "lower." Because altitude is ATC's primary tool in separating aircraft, the controller may not be able to grant your request, or there may be a delay (see "What ATC Might Say When Deferring a Pilot's Request" on page 61).

You may have to negotiate. Pilots need supplemental oxygen to spend more than 30 minutes at 13,000 feet, so you ask for lower instead.

Read back the clearance ⑤, then promptly climb or descend. It's possible that a crossing restriction will be issued, but that's much less common when the pilot has initiated the altitude change.

Before requesting an altitude change, do some checking. ATC is usually reluctant to assign an altitude "inappropriate" for your direction of flight, and they can't approve an altitude below their minimum IFR altitude for your current position.

TIP

If your request is urgent, such as a climb ATC requested has put you in light icing conditions and you need to go back down right away, let the controller know you need an immediate change of altitude and why. This will usually get your request granted without having to elevate the situation to an emergency.

① PILOT
Fort Worth Center, Cirrus Eight Eight Seven Two Bravo, request climb to one one thousand. We're in moderate turbulence down here.

② CENTER CONTROLLER
Cirrus Seven Two Bravo, unable one one thousand due to traffic, but I can give you one three thousand. Will that work?

③ PILOT
Unable one three thousand. Um ... request lower. Cirrus Seven Two Bravo.

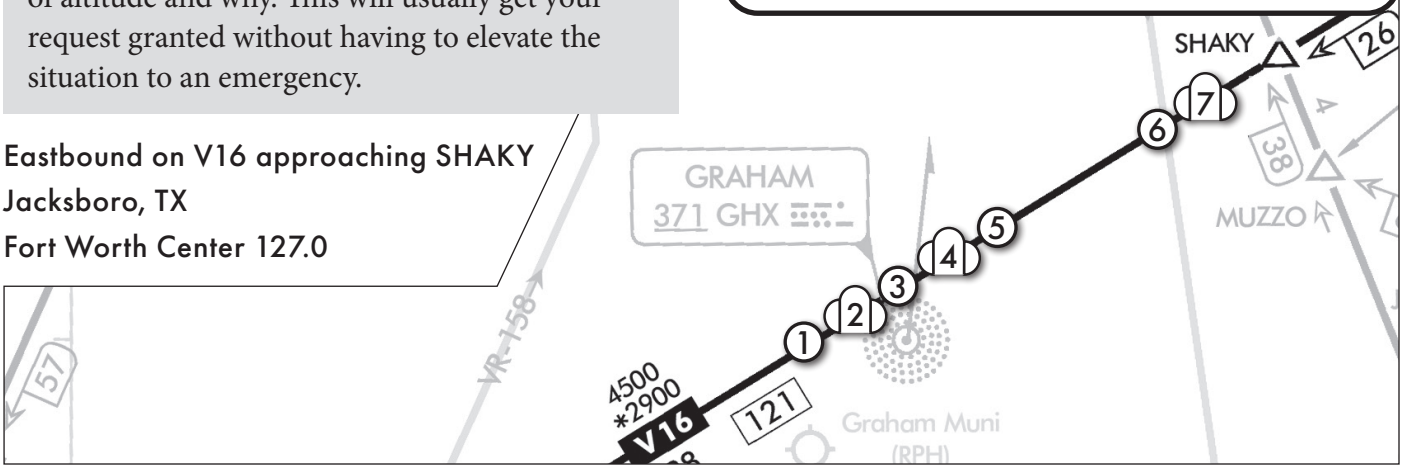
④ CENTER CONTROLLER
Cirrus Seven Two Bravo, descend and maintain seven thousand.

⑤ PILOT
Leaving niner thousand for seven thousand. Cirrus Seven Two Bravo.

Once level at 7000 feet without further chiropractic adjustments ...

⑥ PILOT
Center, Cirrus Seven Two Bravo has a smooth ride at seven thousand.

⑦ CENTER CONTROLLER
Cirrus Seven Two Bravo, roger. Happy to hear that.



Request a Block Altitude

① PILOT
Center, Cirrus Seven Two Bravo, request.

② CENTER CONTROLLER
Cirrus Seven Two Bravo, go ahead.

③ PILOT
We'd like to do holding practice over Keene with climbs and descents. Can we get a block altitude from four thousand to seven thousand for twenty minutes?

④ CENTER CONTROLLER
Cirrus Seven Two Bravo, let's see. I can give you a block from six to eight thousand. Will that work for you?

⑤ PILOT
That'll work. Cirrus Seven Two Bravo.

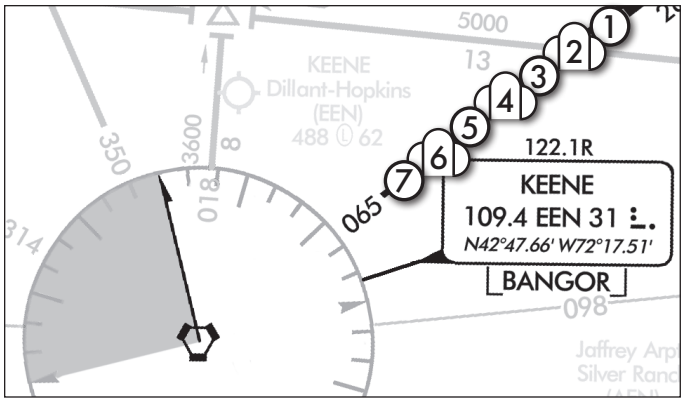
⑥ CENTER CONTROLLER
Cirrus Seven Two Bravo, proceed direct Keene VORTAC. Cleared to fly west of Keene between the two seven zero and the three six zero radials within one zero miles of the VOR. Maintain block six thousand to eight thousand.

⑦ PILOT
Direct Keene VOR. Maintain block six thousand to eight thousand, two seven zero through three six zero radials. Stay within one zero miles of the VOR. Cirrus Seven Two Bravo. Thanks a lot.

TIP

When you have a complex or unusual request, it's good etiquette to simply state "request" as in call ①. This is a heads up to ATC you may require more airtime to explain and their full attention to understand everything without you having to repeat. You can also use "request" on a busy frequency to break in when it isn't urgent.

Southwest-bound on V93/T295 approaching EEN
Marlborough, NH
Boston Center 123.75



Want permission to fly anywhere between two altitudes instead of at a single hard altitude? Request a "block altitude." Block altitudes are great for when you can't (or don't want to) maintain a specific altitude due to turbulence, mountain wave, sloping cloud layers you want to stay between, or icing you want to avoid. Block altitudes are also handy for practicing IFR maneuvers in IMC when changes of altitude are required.

ATC won't assign a block altitude, but you may request it. The format can be casual ③. Generally:

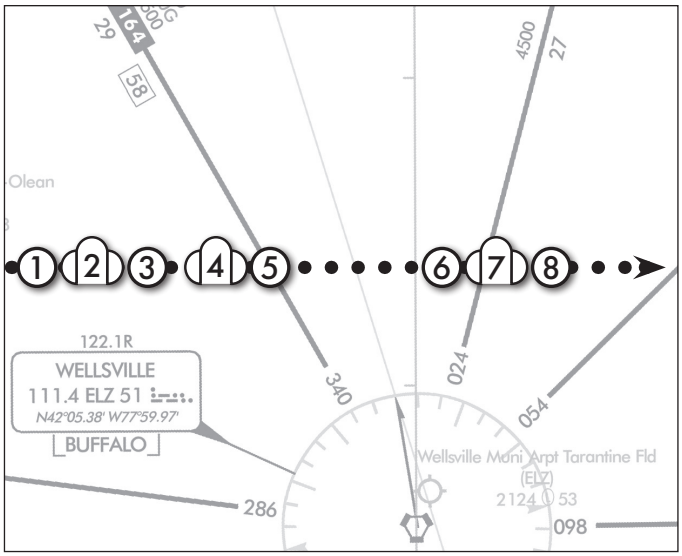
> [ATC Facility], [Call sign], request block altitude from [Bottom altitude] to [Top altitude] for [Time or Distance], [Reason (optional)].

If approved (maybe after a little negotiating), remain between the bottom and top altitudes, and follow any other instructions in the clearance. There's no need to tell ATC as you change altitudes in the block. You own that whole vertical section.

A block altitude clearance is different from a "cruise clearance," in which ATC clears you to fly at any altitude from the minimum IFR altitude up to and including the altitude specified in the clearance, and to execute an approach at your destination airport (page 86.)

Altitude flexibility can be simply for fun: "Cloud surfing" doesn't require a waxed board and sun-bleached hair—just an airplane, some clouds, and a block altitude clearance that includes the cloud tops.

Eastbound north of ELZ and direct KAPV
Wellsville, NY
Cleveland Center 124.325



If you're operating on an IFR flight plan but in VFR weather conditions, you can request "VFR-on-top" instead of an assigned altitude. That's the key: VFR-on-top is an altitude assignment that lets you fly any VFR altitude (odd or even thousand plus 500 feet) from the minimum IFR altitude up to the floor of Class A airspace. It's more flexible than a block altitude, but you must be in conditions where you could fly VFR.

The "on-top" part is a bit of a misnomer. You can fly above the clouds, below the clouds, between layers, or through crystal-clear air on a CAVU day, so long as you comply with VFR visibility and cloud clearance requirements.

There are some restrictions. ATC will continue to provide traffic advisories and safety alerts, but IFR separation isn't applied, so you have to "see and avoid" other aircraft yourself. You must tell ATC before changing altitude. You're still IFR, so you must comply with all IFR rules (follow your cleared route, stay above minimum IFR altitudes, etc.).

If you're already in visual conditions, just say, "request VFR-on-top." However, if you want a climb through instrument conditions to visual conditions (and already on an IFR flight plan) say: "Request climb to VFR-on-top" ③. If the controller grants your request ④, he'll tell you the reported height of the tops or that "no tops reports" is available.

① PILOT
Center, Cirrus Eight Eight Seven Two Bravo, request.

② CENTER CONTROLLER
Cirrus Eight Eight Seven Two Bravo, Cleveland Center, say request.

③ PILOT
Cirrus Eight Eight Seven Two Bravo, request climb to VFR-on-top.

④ CENTER CONTROLLER
Cirrus Seven Two Bravo, climb to and report reaching VFR-on-top. No tops reports. If not on top at one one thousand, maintain one zero thousand and advise.

⑤ PILOT
Cleared to climb to VFR-on-top, leaving five thousand. We'll report VFR-on-top. Cirrus Seven Two Bravo.

After reaching a VFR altitude and required cloud clearances:

⑥ PILOT
Cleveland Center, Cirrus Seven Two Bravo, VFR-on-top at nine thousand five hundred.

⑦ CENTER CONTROLLER
Cirrus Seven Two Bravo, roger. Maintain VFR-on-top. If unable, advise.

⑧ PILOT
Maintain VFR-on-top. Cirrus Seven Two Bravo.

Once you're on top in visual conditions and at a VFR cruising altitude, let the controller know ⑥. If conditions deteriorate and you want a hard IFR altitude again, just ask ATC—you're already on an IFR flight plan, so it should be simple to get.

Receive or Request a Shortcut

(1) APPROACH CONTROLLER
Cirrus Seven Two Bravo, cleared direct INOLA.

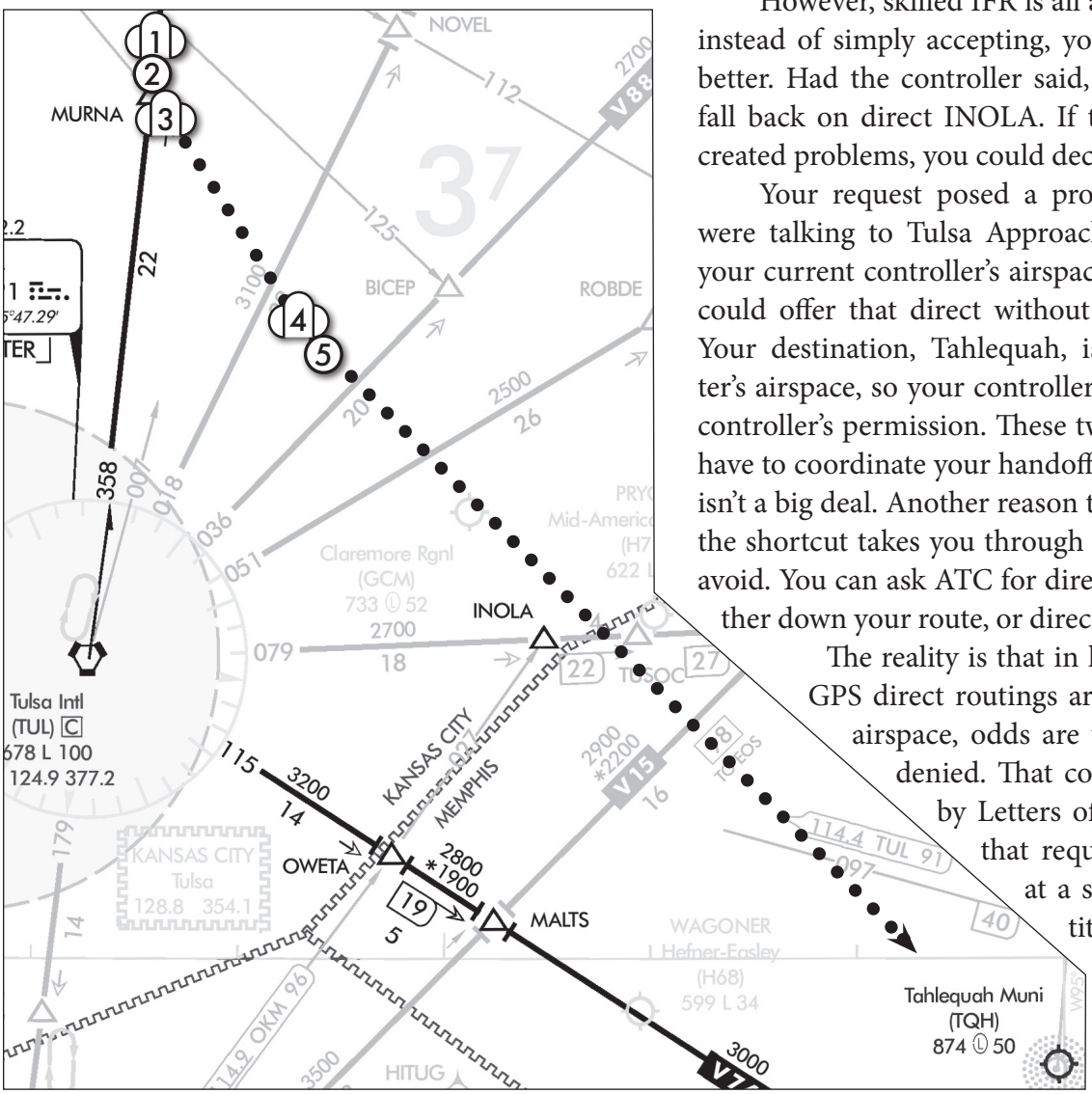
(2) PILOT
Direct INOLA for Cirrus Seven Two Bravo. Is there any chance we could get direct Tahlequah Muni instead?

(3) APPROACH CONTROLLER
Cirrus Seven Two Bravo, that's Memphis' airspace. Uh, standby.

(4) APPROACH CONTROLLER
Cirrus Seven Two Bravo, cleared direct Tahlequah airport.

(5) PILOT
Direct Tahlequah airport. Appreciate it. Cirrus Seven Two Bravo.

Southbound on V131 north of Tulsa VOR
Talala, OK
Tulsa Approach 119.1



Sometimes ATC offers you a shortcut. It might be because the controller doesn't have much traffic and is feeling generous. It might be because there's lots of traffic, and getting you out of the way sooner is a plus. Either way, you win. If you simply accepted, call (2) would be: "Direct INOLA, Cirrus Seven Two Bravo."

However, skilled IFR is all about negotiation, so instead of simply accepting, you ask for something better. Had the controller said, "unable," you could fall back on direct INOLA. If the shortcut actually created problems, you could decline it (page 63).

Your request posed a problem, however. You were talking to Tulsa Approach. INOLA is within your current controller's airspace, so your controller could offer that direct without asking anyone else. Your destination, Tahlequah, is in Memphis Center's airspace, so your controller needs the Memphis controller's permission. These two controllers would have to coordinate your handoff later anyway, so this isn't a big deal. Another reason to negotiate might be the shortcut takes you through weather you'd rather avoid. You can ask ATC for direct to a waypoint further down your route, or direct to your destination.

The reality is that in low-density airspace, GPS direct routings are the norm. In busy airspace, odds are your request will be denied. That could be for traffic, or by Letters of Agreement (LOAs) that require handing you off at a specific place and altitude. The controller has little freedom in these cases, but it never hurts to ask.

WHAT ATC MIGHT SAY WHEN DEFERRING A PILOT'S REQUEST

Sometimes you ask ATC for something in your most polite, "pretty please" voice and get back an answer that's, at best, non-committal. There are subtleties to these responses that can matter. There are also a few functional tips that can make the process smoother.

"I have your request," means the controller can't grant it yet, but he or she is working on it. It might just be a timing issue where you've asked for something the controller can't do yet, or it might require some coordination. Because this is a "don't call me, I'll call you" situation, don't repeat the request unless you're confident it's been forgotten.

"You can expect that," is one step better than "I have your request," in that the controller has committed to granting your request, just not yet. The only functional difference between the two is if you were to lose communications. Expected clearances factor into the hierarchy of routes and altitudes to fly. Simple requests do not.

Sometimes a **traffic callout** is a factor in granting your request. Once you've reported another aircraft in sight, the controller can have you "maintain visual separation" from that aircraft and grant something that otherwise wouldn't be allowed. Collision avoidance is now on you.

"Make your request with the next controller," means your current controller doesn't have the authority to grant your request, or the approval would be so short-lived it wouldn't be worth it. Remember that the handoff happens before you're actually told to switch, and before you cross an airspace boundary. So wait five to ten minutes after a handoff—"Contact Seattle Approach on 131.5"—before requesting again to ensure you've flown into the new controller's airspace.

REQUIREMENTS WHEN TRAVELING OFF ROUTE

GPS has changed the face of instrument flying. Once upon a time, IFR was all about cruising down the airways from VOR to VOR. GPS direct is the norm over much of the country these days, and even in busy airspace for short stretches.

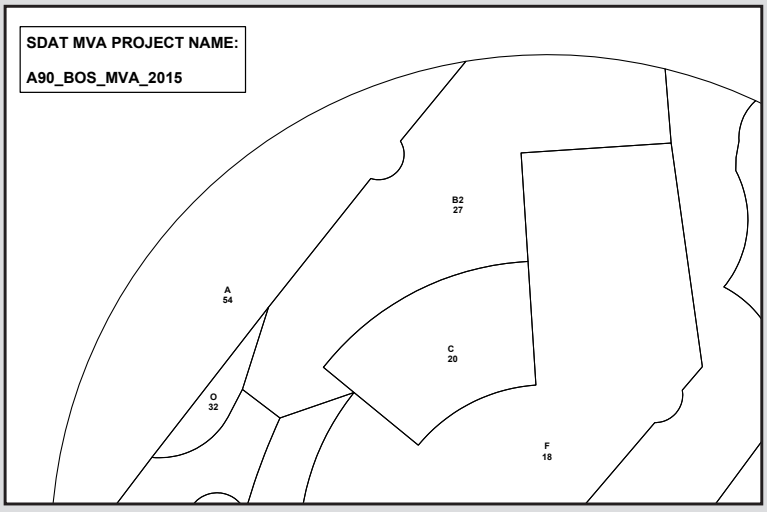
However, off-route cruising almost always requires radar contact. (There are a few exceptions.) "Off-route" means not on an airway or segment that has a published MEA.

You must also be high enough that a controller could issue a vector (see "Minimum Vectoring and Instrument Altitude (MVA/MIA)" on page 48). These altitudes are obstacle-free by definition.

When you're navigating GPS direct to a fix, you're not on a vector, so you're technically on the hook for obstacle clearance. However, if you're cruising off-route and you're approaching an area of a higher MIA/MVA, ATC will issue a climb to at least the new MIA/MVA. This becomes the de facto obstacle clearance from ATC.

MIAs or MVAs appear on the controllers' scopes and on cryptic diagrams you can download from the FAA, but they don't appear on pilot navigation charts. This matters when those altitudes are lower than the OROCA for the quadrant you're flying through.

If you're in radar contact off-route and the altitude is OK with the controller, you shouldn't be concerned. However, you're always welcome to check with ATC on what the MIA/MVA is for your current position.



Request a Vector to a Fix, Direct When Able

① APPROACH CONTROLLER
Cirrus Seven Two Bravo, cleared direct SAPPE.

② PILOT
Um, could we get a vector to SAPPE while I get my GPS set up? Cirrus Seven Two Bravo.

③ APPROACH CONTROLLER
Cirrus Seven Two Bravo, no problem. Fly heading one seven zero, direct SAPPE when able.

④ PILOT
Heading one seven zero, direct SAPPE when able. And could we get a spelling of SAPPE? Cirrus Seven Two Bravo.

⑤ APPROACH CONTROLLER
Cirrus Seven Two Bravo, that's Sierra Alpha Papa Papa Echo.

⑥ PILOT
Thanks. Cirrus Seven Two Bravo.

⑦ PILOT
Cirrus Seven Two Bravo is direct SAPPE.

⑧ APPROACH CONTROLLER
Cirrus Seven Two Bravo roger.

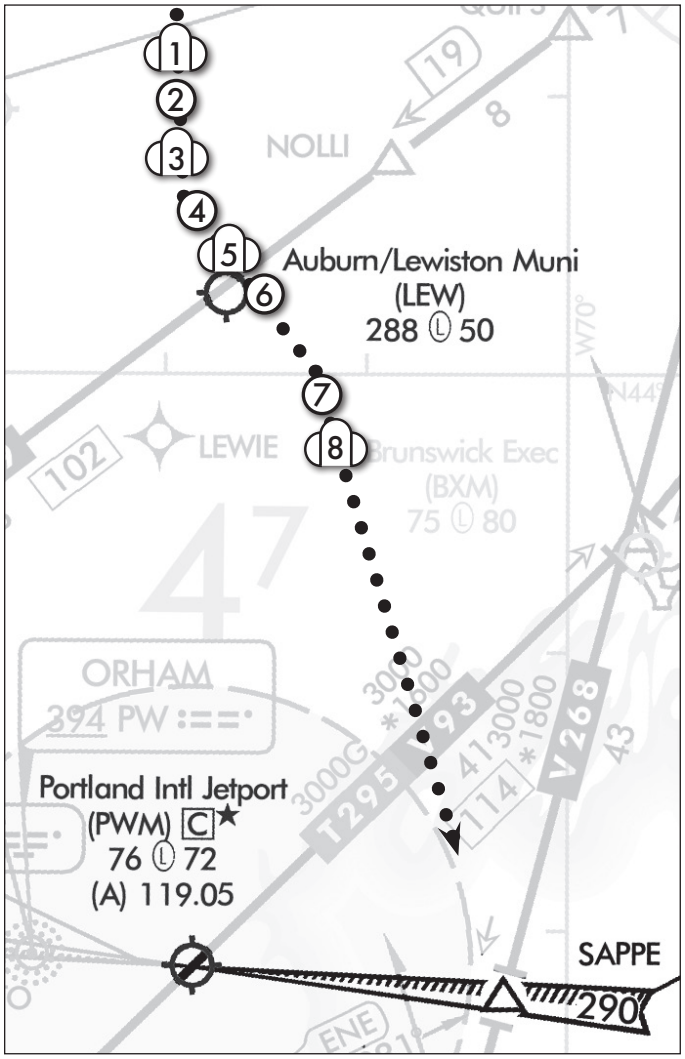
If ATC clears you direct to a waypoint that's unfamiliar to you, you don't have to make a mad scramble to dial that waypoint into your GPS. Simply request a vector toward the fix, with "direct when able." This gets you going in the correct direction with no delay and buys you time to find the actual fix for more precise direct-to navigation.

How could you not know the name of a fix ahead of you? Perhaps the fix isn't listed in your GPS flight plan because there's no bend in the airway there. Perhaps, as in this example, it's a fix on the approach that you didn't have set up yet. Perhaps it's a fix that's really a routing change. "Direct CLOWW then direct Portland," is common when approaching KPWM. CLOWW is a fix unassociated with any airway, but it's used to set up approaches to Portland Intl. Jetport.

If you don't know the spelling of the fix and can't find it on the chart—SAPPE, SAPPY, SAPEE?—just ask ④. Once you're actually flying direct via GPS navigation, it's good etiquette to tell the controller ⑦.

This trick isn't just for GPS users. If you want direct to a VOR that's out of range, you can ask for a "vector and direct when able." Fly the vector and monitor the VOR. Once you have reception, you can proceed direct under your own navigation.

Southbound direct KPWM
North of Lewiston, ME
Portland Approach 119.75



Refusing a clearance isn't something to be done casually, but if ATC tells you to do something you know your airplane isn't capable of, you believe would be unsafe or a regulatory violation, or you're just uncomfortable doing, say "unable" ②.

Instead of thinking of "unable" as a flat-out refusal, however, consider it the beginning of a negotiation. The controller has a reason for giving you the instruction. He or she probably knows the general limits of your airplane (ATC won't ask you to maintain 200 knots in a Cessna 172), but that controller doesn't know the limits of your skill, experience, or comfort zone. The controller may have no idea of your current flight conditions, as happens here.

So, after you say that magic word, explain why you're saying it. That lets the controller come up with other options. If you think it's helpful, feel free to offer a solution that you and your airplane can do. In this case, you could have offered to descend, but the astute Bonanza pilot chimed in with a better option. We're all in this IFR thing together.

① CENTER CONTROLLER
Cirrus Seven Two Bravo, you're closing on a Bonanza ahead of you. Climb and maintain one zero, ten thousand.

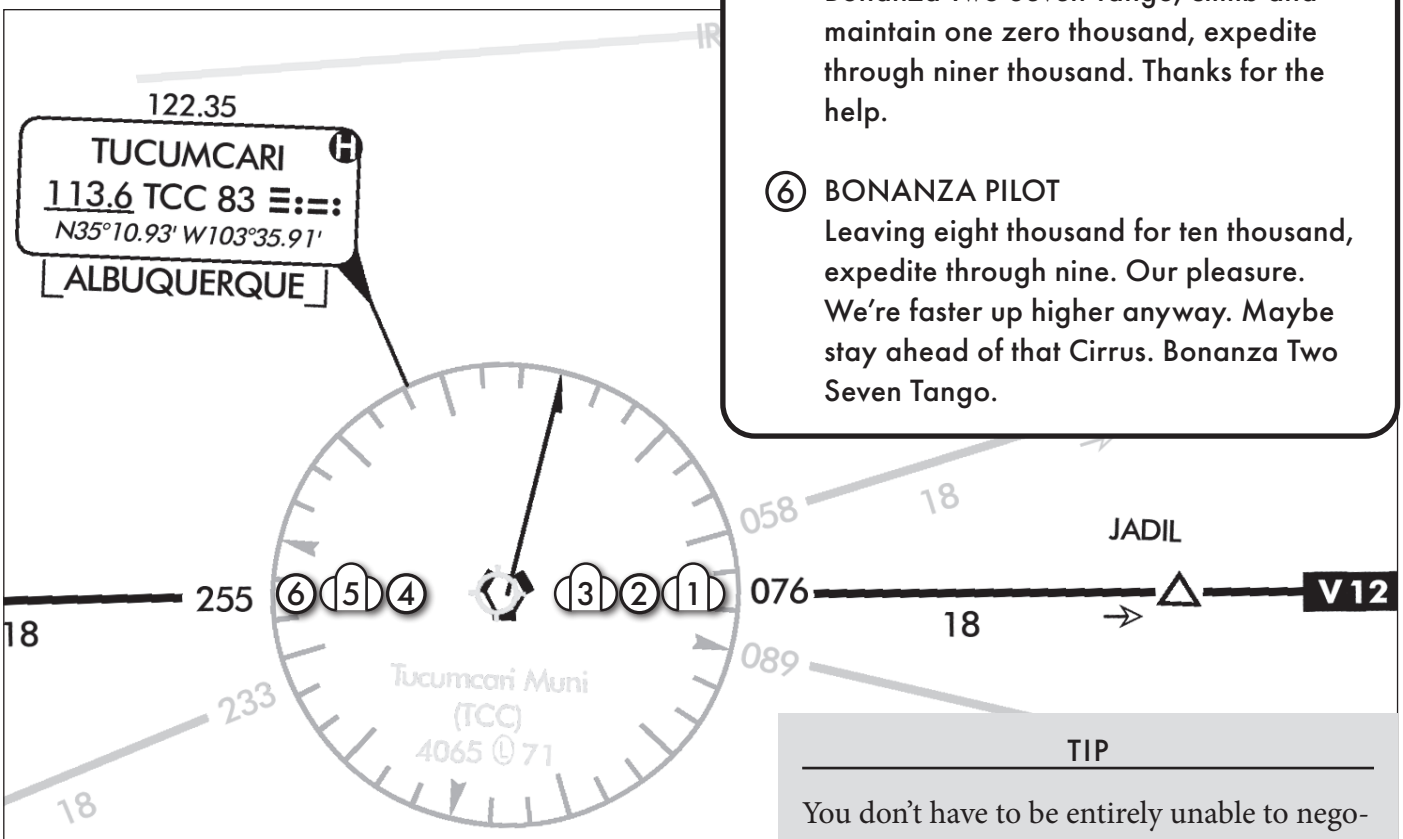
② PILOT
Cirrus Seven Two Bravo is unable ten thousand. That'll put us above the freezing level, and we don't have deice.

③ CENTER CONTROLLER
Cirrus Seven Two Bravo, roger. Maintain eight thousand.

④ BONANZA PILOT
Albuquerque Center, Bonanza Two Seven Tango, we have deice and can accept ten thousand.

⑤ CENTER CONTROLLER
Bonanza Two Seven Tango, climb and maintain one zero thousand, expedite through niner thousand. Thanks for the help.

⑥ BONANZA PILOT
Leaving eight thousand for ten thousand, expedite through nine. Our pleasure. We're faster up higher anyway. Maybe stay ahead of that Cirrus. Bonanza Two Seven Tango.



Westbound on V12 approaching Tucumcari VOR
Tucumcari, NM
Albuquerque Center 126.85

TIP

You don't have to be entirely unable to negotiate a clearance. For example, if an altitude change would put you into stronger headwinds, ask if ATC can offer other options.

Request a Deviation from the Cleared Route

① PILOT
Kansas City Center, Cirrus Eight Eight Seven Two Bravo, request deviation left twenty degrees for weather ahead.

② CENTER CONTROLLER
Cirrus Seven Two Bravo. Approved as requested. Report when back on course.

③ PILOT
Turning twenty left. We'll report when back on course. Cirrus Seven Two Bravo.

④ CENTER CONTROLLER
Cirrus Seven Two Bravo. I had a Baron go through the weather at your eleven to two o'clock, two five miles. At niner thousand, they reported light precip and moderate turbulence.

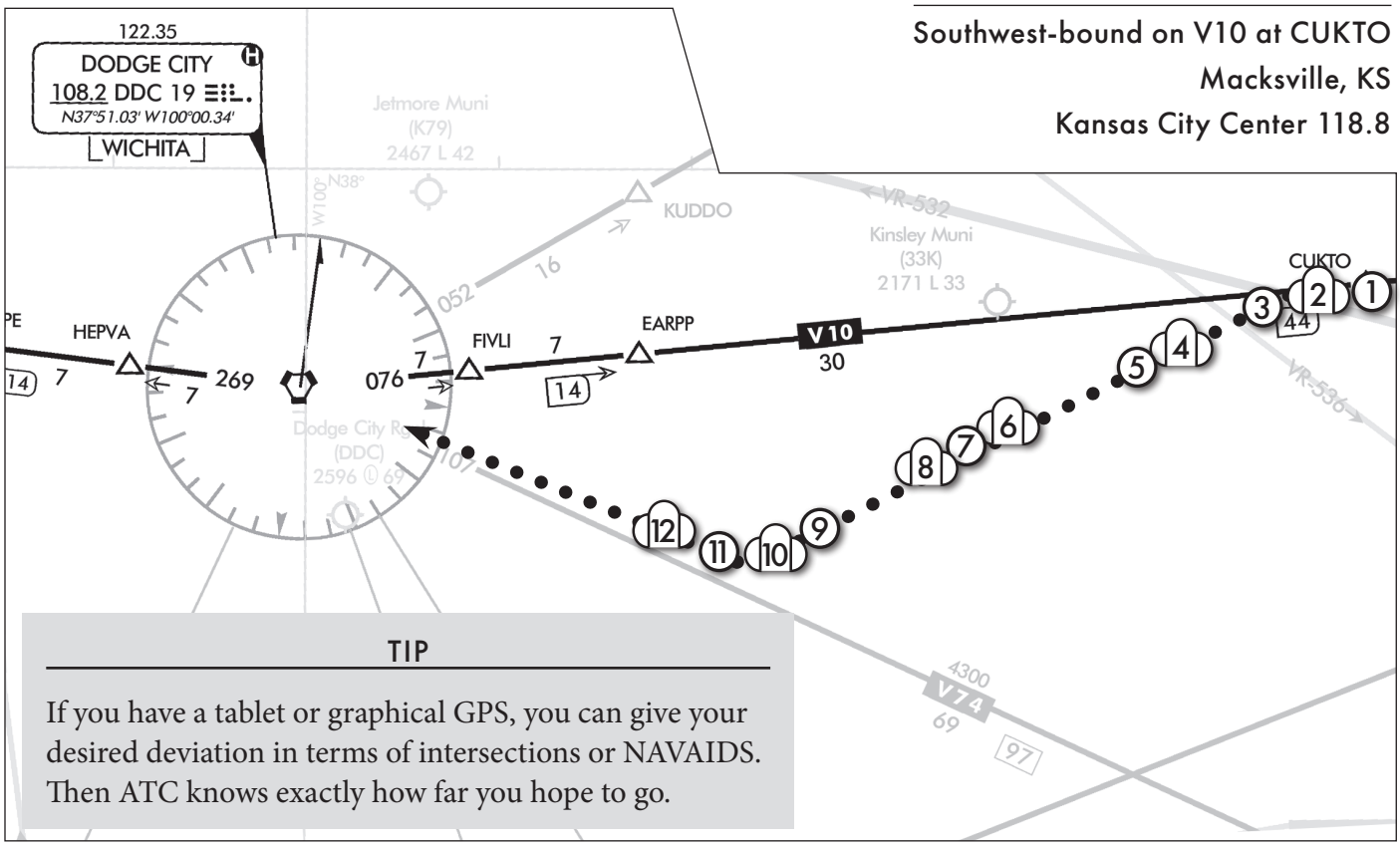
⑤ PILOT
Roger. Cirrus Seven Two Bravo.

One irony of instrument flying is you earn the right to fly through the weather—and then do your best to stay out of it for safety and comfort. This means the most common reason for requesting a temporary deviation from your cleared route is getting around weather. The basic format is:

> [Facility], [Call sign], request [Details of deviation], for [Reason].

Deviations could be specific, "request twenty degrees right" or "request direct [fix] to avoid weather"; or general, "request maneuvering right of course for the next twenty miles or so to stay visual between buildups." The reason could be serious, such as weather you must avoid, or casual, such as getting a better view of Niagara Falls on a clear day. Because you're on an IFR flight plan, you must get permission to deviate from course for any reason.

The reason is important because ATC must weigh your request against the constraints of other traffic and airspace. Deviations around weather are rarely delayed and almost never refused. Sightseeing ... well, that doesn't have as much clout.



Southwest-bound on V10 at CUKTO
Macksville, KS
Kansas City Center 118.8

TIP

If you have a tablet or graphical GPS, you can give your desired deviation in terms of intersections or NAVAIDS. Then ATC knows exactly how far you hope to go.

OFF COURSE BY ACCIDENT, OR "HEY BUDDY. WHERE ARE YOU GOING?"

Ask most pilots how far they can stray from a course before they get in trouble, and the most common answer you'll get is, "one mile."

That may be the fail point on a checkride, but the rule is actually that you fly the center of the route. There's no official "allowed error."

That said, few of us are perfect (with the autopilot off, anyway) and small deviations in course are overlooked. It's rarely an obstacle issue, Airways are generally considered eight NM wide. Off-route direct clearances happen above the MIA/MVA for that area, which is obstacle free (See "Requirements When Traveling Off Route" on page 61.)

If a controller sees that you've drifted off your cleared route, you'll usually get a statement about

that fact, and maybe a vector back in the right direction: "Cirrus Seven Two Bravo, I show you two miles east of Victor Three Forty-Four. Turn right heading two four zero, rejoin Victor Three Forty-Four."

Similarly, ATC can't tell you're off altitude by less than 100 feet, but if you were to stray a bit more, you might hear, "Cirrus Seven Two Bravo, say altitude?" This is really a polite reminder to keep your eyes on those instruments and not accept any ongoing deviations.

ATC might simply approve the deviation and ask you to report rejoining your route, or combine approval for a weather deviation with a clearance back on course: "Cirrus Seven Two Bravo, deviations left of course approved, maintain eight thousand. When able, fly heading three zero zero, vector to join Victor Twelve, and advise."

If traffic prevents the controller from approving the specific deviation you request, he or she may offer something else. This is why it's best to make your request sooner, rather than at the last minute.

While it's not the controller's job to make suggestions, sometimes a well-meaning controller will offer that other aircraft have gone through the weather you're avoiding ④, or suggest a path through weather that feels too tight for you. Remember, you're the one in the aircraft—and on the NTSB report if things turn out badly. Don't let peer pressure tempt you into something you wouldn't do on your own.

Likewise, if a controller suggests the weather you're getting close to might be best avoided, consider that advice from a knowledgeable friend.

The controller may have a limit on how far you can deviate ⑥. Keep asking for what you need and what you're doing, but ensure you do it clearly so there's no confusion ⑨-⑪.

If your request for a deviation is denied, and you're concerned about your safety, you always have another option: Declare an emergency.

⑥ CENTER CONTROLLER
Cirrus Seven Two Bravo, how much further south will you be going?

⑦ PILOT
We're almost past it. Maybe ten more miles? Cirrus Seven Two Bravo.

⑧ CENTER CONTROLLER
Cirrus Seven Two Bravo, roger. When able proceed direct Dodge City.

⑨ PILOT
OK. I think we can do Dodge City now without passing too close to those clouds. Cirrus Seven Two Bravo.

⑩ CENTER CONTROLLER
Cirrus Seven Two Bravo, are you direct Dodge City now?

⑪ PILOT
Cirrus Seven Two Bravo is direct Dodge City. Thanks for the help.

⑫ CENTER CONTROLLER
Cirrus Seven Two Bravo, no problem.

ASKING ATC ABOUT WEATHER THEY SEE ON RADAR

In these days of free NEXRAD radar on your tablet in the cockpit, we forget that ATC radar can detect precipitation as well. However, what ATC can see depends on who you're talking to.

The greatest capability comes from Approach facilities (TRACONs) with Airport Surveillance Radar (ASR). These sites can display precipitation with six levels of intensity. Most importantly, the display is in real time, meaning it shows the precipitation as it exists right now. That's different from datalink radar, which is at best five minutes old, and could be 20 minutes or more old. That's an eternity in a convective environment.

Storm Description Secret Decoder Chart (ASR Edition)

Strength in dBz	Storm Level	How ATC Describes It	Potential Rainfall (in/hr)
16-29 dBz	Level 1	Light	0.01-0.15
30-39 dBz	Level 2	Moderate	0.15-0.5
40-49 dBz	Level 3	Heavy	0.5-2.0
	Level 4		
50+ dBz	Level 5	Extreme	2.0-16.0
	Level 6		

Even though there are six levels, ATC phraseology groups them into four: "Light" precip is under 29 dBz, "moderate" is 30-39 dBz, "heavy" is 40-49 dBz, and "extreme" over 50 dBz. In general, radar returns of 40 dBz or more mean potential turbulence light aircraft should avoid. Return of 50 dBz or more should be avoided at all costs.

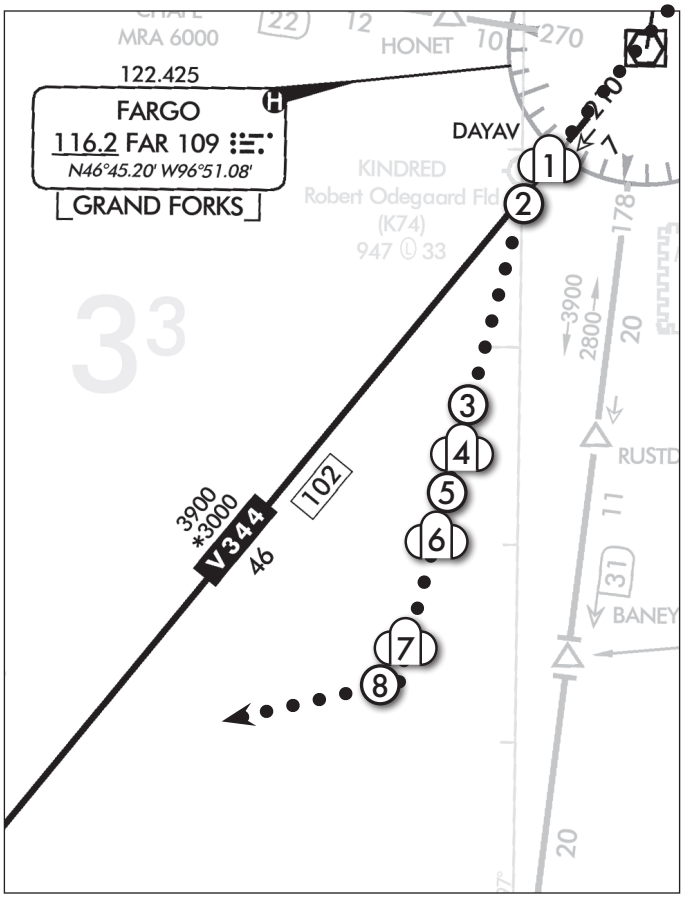
If you're talking to Approach, the controller may volunteer information about precip, "Area of moderate precipitation, one o'clock to three o'clock, ten miles. Area is two zero miles in diameter." If the controller reported it as "heavy," you could ask if that was level 3 or 4 to gauge how much buffer you want to give that weather. You can also compare the controller's location of the weather with what you see on your cockpit datalink to get a sense of the current delay on your NEXRAD image.

ASR radar has limitations. It's line of sight, so there could be areas of dangerous precipitation that the controller can't see because it's hidden by lesser precipitation. Each site is different. The controller might be able to switch source antennas or view a composite, or the controller might not. Some sites still have older radar systems that can't discern all six levels, and range is usually limited to 55 miles of the primary airport. That's why the ideal situation is combining ASR with datalink weather.

If you're talking to a Center (ARTCC), the assistance from ATC is limited. Their direct radar can only show "light" or "heavy" precip, and sometimes wouldn't show precip at all. Center has a supplemental system called Weather and Radar Processor (WARP). WARP creates a NEXRAD-like overlay with three intensities. These map to the same "moderate, heavy, and extreme" terms used by Approach. (Consistency from the FAA. There is hope.) Light precip is not shown.

WARP is a processed image, however, so it's on a delay of up to eleven minutes. It's still a different system than your cockpit datalink, so comparing the controller's description with what you see can still have real value. It's possible to ask a controller to turn off WARP and compare the location of the weather WARP painted with the simple returns that are in real time. You're asking something special with that, however, and if you're dodging weather, so is everyone else. The controller may not have the free time to meet your request.

Southwest-bound on V344
Kindred, ND
Fargo Approach 120.4



The preferred method for separating aircraft is usually an altitude change (page 63) because the conflict is resolved with a single clearance. However, there are plenty of times when it's better to vector one aircraft off course temporarily.

When you receive a vector off course, you'll always be given the reason. Sometimes you'll be told what to expect as well ①. These are important in case you lose communication while on the vector and have to apply lost communications rules to properly rejoin your cleared route.

Even though you're on a vector, it's expected that you will advocate for your own well being ③. So long as the situation is acceptable to you, just wait it out. Eventually, you should get a vector back to your route, or a clearance direct to a fix downstream along your route. In this case, it's the former, with instructions to rejoin the airway, and resume your own navigation ⑦.

① APPROACH CONTROLLER
Cirrus Seven Two Bravo, fly heading one eight zero, vector for traffic. Expect turn back on course in one zero miles.

② PILOT
Fly heading one eight zero, Cirrus Seven Two Bravo.

As this course brings you closer to weather ...

③ PILOT
Fargo Approach, Cirrus Seven Two Bravo, how much longer on this heading? We're getting disquietingly close to some towering cumulus.

④ APPROACH CONTROLLER
Cirrus Seven Two Bravo, it'll be about three more miles. Will that work for you?

⑤ PILOT
That should be fine. Seven Two Bravo.

⑥ APPROACH CONTROLLER
OK. Keep me advised.

⑦ APPROACH CONTROLLER
Cirrus Seven Two Bravo, turn right heading two four zero, rejoin Victor Three Forty-Four, resume own navigation.

⑧ PILOT
Right heading two four zero, rejoin Victor Three Forty-Four, resume own navigation. Cirrus Seven Two Bravo.

TIP

If you think ATC has forgotten about you, a polite, "How much longer on this heading?" or "When can we expect a turn on course?" should get an answer (and perhaps an immediate turn).

Receive an Amendment/Change in Routing

1 APPROACH CONTROLLER
Cirrus Seven Two Bravo, Syracuse Approach. I have an amendment to your clearance. Advise when ready to copy.

2 PILOT
Ready to copy. Cirrus Seven Two Bravo.

3 APPROACH CONTROLLER
Cirrus Seven Two Bravo, cleared to the Glens Falls Airport, change route to read Georgetown, Victor Four Twenty Eight, Utica, Victor Four Ninety Six, Glens Falls, direct.

4 PILOT
Route is now Georgetown, Victor Four Twenty Eight, Utica, Victor Four Ninety Six, Glens Falls, direct. Cirrus Seven Two Bravo.

5 APPROACH CONTROLLER
Cirrus Seven Two Bravo, readback correct.

6 PILOT
Thanks, that'll save us some time. Cirrus Seven Two Bravo.

7 APPROACH CONTROLLER
That never happens. You should play the lottery when you land.

There are lots of reasons ATC might change your routing: changes in the traffic flow or a destination airport runway in use, large developing weather systems, or changes in the status of Special Use Airspace. A flight plan can be accepted into the system that doesn't work for a facility further down the line. An amendment to your clearance is a permanent change to your route. It can come in flight or while you're still taxiing to the departure runway.

For a change all the way to your destination, the format is:

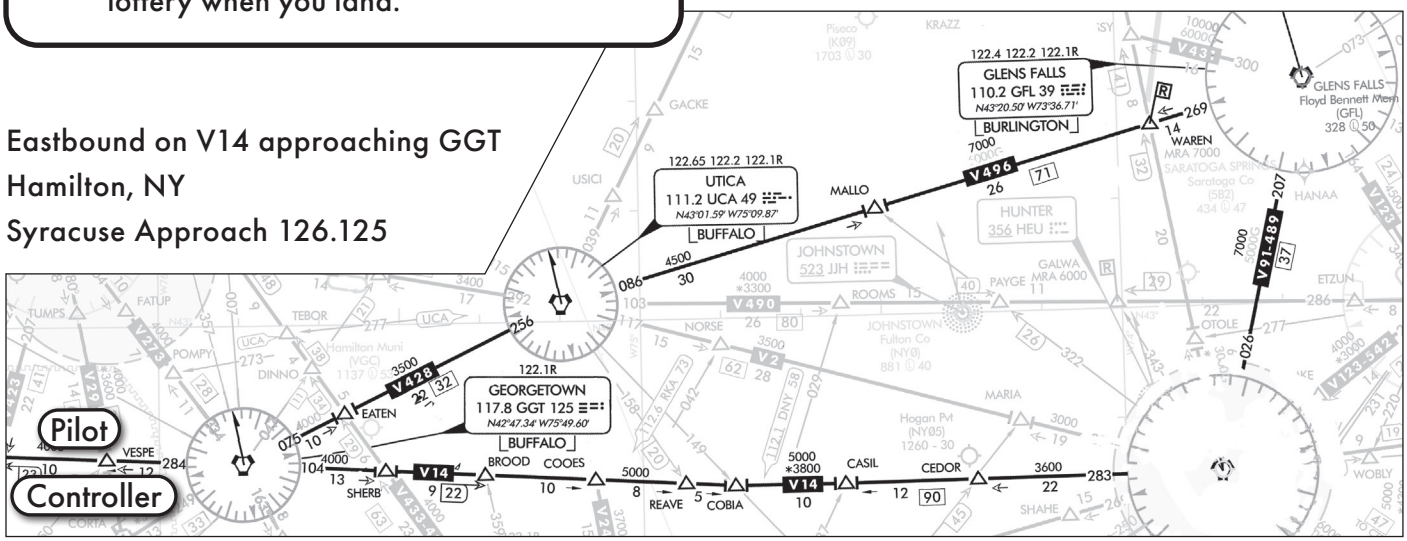
> [Aircraft call sign], cleared to [Restated clearance limit], change [Portion of route] to read [New route].

If the changed portion is an intermediate section that rejoins the original route, the format is:

> [Aircraft call sign], after [Waypoint on route], [New section of route], rest of route unchanged.

Reroutes can be complex, so say "Ready to copy" once you're really ready. Be prepared to take notes. If you don't recognize a waypoint in the clearance, ask the controller to spell it.

You can refuse an amended clearance, but there's a reason for the change. Have a good reason to refuse, and be prepared for some other re-route in its place. Once you accept a reroute, don't forget to update the flight plan in your GPS.



Eastbound on V14 approaching GGT
Hamilton, NY
Syracuse Approach 126.125

Sometimes your plans change. Maybe you don't like the way the engine is running, a passenger isn't feeling well, or you need a break from the turbulence. Maybe you realize you really should have used the restroom at the last FBO. If you're in visual conditions near an airport, the simplest course is to cancel IFR and land VFR. If you're in IMC, or just want to keep the IFR clearance, you must change your destination—even if that destination is right below you.

The format is simple:

> [Facility name], [Call sign], request change in destination to [New destination].

The controller may inquire about the reason for the change in destination ②. ATC isn't required to ask, but if the change seems suspicious, they're required to report the change to the "Domestic Events Network," a network of all the Air Route Traffic Control Centers and other government agencies.

You don't need to provide a lot of detail. Something like "weather," "mechanical issue," "fuel," "sick passenger," or "passenger request" should do it. There may be a delay if your controller has to coordinate with another controller. That can happen even for an airport directly below you if you're high enough.

TIP

Consider how any routing change, or unplanned stop, impacts your required IFR fuel reserves and alternate planning.

Once you accept the new clearance by reading it back ⑥, your original clearance is void. You'll need to refile, and get a new clearance after you land before proceeding on to your original destination.

① PILOT
Minneapolis Center, Cirrus Eight Eight Seven Two Bravo. Request change in destination to Lac Qui Parle.

② CENTER CONTROLLER
Cirrus Eight Eight Seven Two Bravo, Minneapolis Center, roger. State the reason for your destination change.

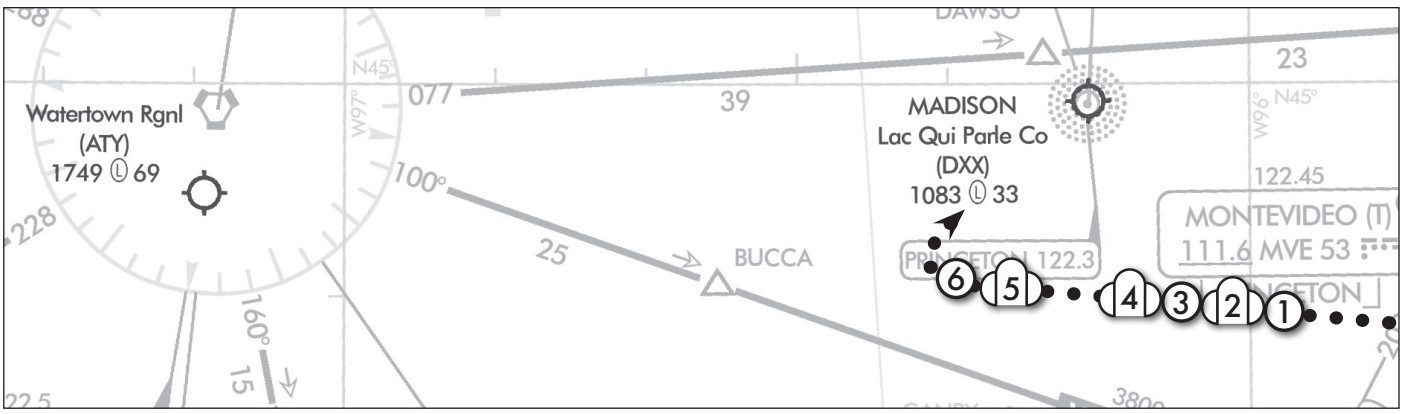
③ PILOT
Weather. Waiting for a line of thunderstorms to pass by Watertown. Cirrus Eight Eight Seven Two Bravo.

④ CENTER CONTROLLER
Cirrus Seven Two Bravo, roger. Standby.

⑤ CENTER CONTROLLER
Cirrus Seven Two Bravo is cleared to the Lac Qui Parle County Airport, present position direct. Descend and maintain four thousand.

⑥ PILOT
Cleared to the Lac Qui Parle County Airport, present position, direct. Leaving eight thousand for four thousand. Thanks. Cirrus Seven Two Bravo.

Westbound direct Watertown
Canby, MN
Minneapolis Center 128.5



Request to Go Off Frequency (for Weather Information)

① PILOT
Houston Center, Cirrus Seven Two Bravo, request temporary frequency change to call Flight Service for weather.

② CENTER CONTROLLER
Cirrus Seven Two Bravo, frequency change approved. Report back on frequency.

③ PILOT
We'll report back on frequency, thanks. Cirrus Seven Two Bravo.

④ PILOT (on 122.2)
Greenwood Radio, Cirrus Eight Eight Seven Two Bravo, one zero southwest of McComb on the Greenwood RCO, one two two point two.

⑤ FLIGHT SERVICE SPECIALIST
Cirrus Eight Eight Seven Two Bravo, Greenwood Radio. Go ahead.

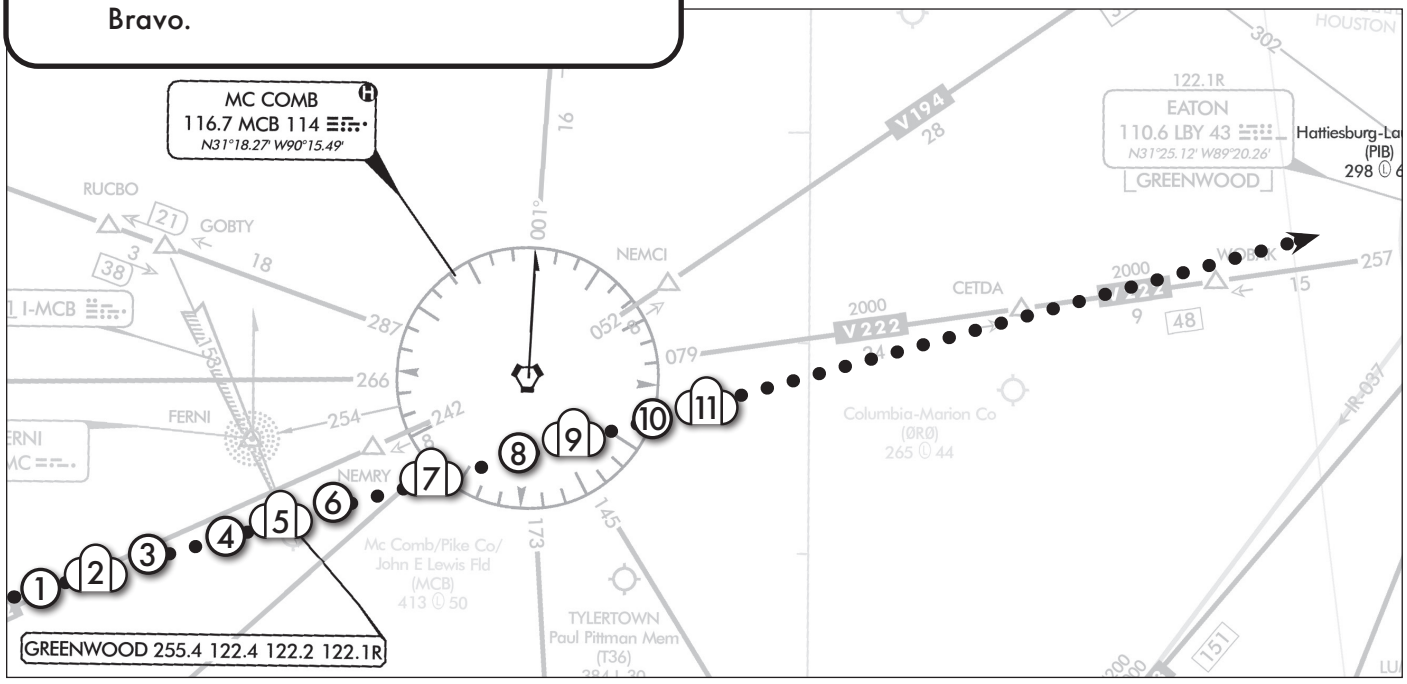
⑥ PILOT
We're IFR to Hattiesburg. Request the current observation and forecast for Hattiesburg. Cirrus Eight Eight Seven Two Bravo.

While cruising under IFR, you're constantly listening for your call sign popping out from the endless stream of ATC chatter. Miss a call and they get testy. This leaves pilots struggling to multi-task using two radios for needs like listening to ATIS in a busy traffic environment.

Yet it's perfectly acceptable to leave the frequency entirely with permission. This could be for simply getting the ATIS/ASOS in peace, or for a more complex communication such as talking to Flight Service because you don't have datalink weather on board. There's listening to Hazardous In-flight Weather Advisory Service (HIWAS), which continuously broadcasts somewhat cryptic information about hazardous weather over selected navaids. We've even heard of people doing this to make a phone call and update a friend with the pilot's ETA. (Not that we would ever do that. Ahem.)

It's also true that controllers have access to pretty much any weather product, so if the controller can't let you go off frequency for some reason, he or she might simply get the weather information you need and read it to you instead.

Direct to Hattiesburg-Laurel Rgl. Airport (KPIB)
Tylertown, LA
Houston Center 126.8
Greenwood Radio 122.2



RADIOS WITH STANDBY FREQUENCY MONITORING

Listening to ATC on one radio while monitoring ATIS or ASOS on a second radio is one of those core IFR skills. It's a balancing act of keeping the secondary radio loud enough to hear, while not so loud you miss your call sign and an instruction from ATC.

Some radios have a standby monitor option that helps immensely. This function plays the transmission on the standby frequency, which could be tuned to the destination ATIS, until there's a transmission on the active frequency. Then the standby is muted and the active played.

(7) FLIGHT SERVICE SPECIALIST
Cirrus Eight Eight Seven Two Bravo, roger ... The Hattiesburg one three one five observation: winds one five zero at four, visibility four in mist, ceiling six hundred overcast, temperature two zero, dewpoint one niner, altimeter three zero one two. The TAF for thirteen hundred Zulu is winds one five zero at five, visibility greater than six, ceiling fifteen hundred broken. Looking around the region, it's pretty much the same until fifteen hundred zulu. After that, it's ten miles and six thousand scattered.

(8) PILOT
That's all we need. Thanks for your help. Cirrus Eight Eight Seven Two Bravo.

(9) FLIGHT SERVICE SPECIALIST
Cirrus Eight Eight Seven Two Bravo, you're welcome. The McComb altimeter is three zero one two. Details upon request, pilot reports appreciated.

(10) PILOT (on 126.8)
Houston Center, Cirrus Seven Two Bravo back on frequency.

(11) CENTER CONTROLLER
Cirrus Seven Two Bravo, roger.

ASKING YOUR FELLOW AVIATORS

Other pilots flying the same route as you can be a great source of weather information. Your link to ask them is ATC.

For turbulence, you can ask your controller if there are any "ride reports" from other pilots. Your controller might even query another plane ahead of you to find out. This can be a great way to find a smooth altitude. Likewise, you can ask about cloud tops, bases, icing, winds, or thunderstorm coverage. Just remember the reports are only as accurate as another pilot's observation or short-term memory.

If you encounter turbulence, you can report it. Use the "Turbulence Reporting Criteria" in the AIM (7-1-23) to report the intensity and frequency of the bumps as "Light Turbulence," "Light Chop," "Moderate Turbulence," "Moderate Chop," "Severe Turbulence," or "Extreme Turbulence." No turbulence? Just say "Smooth." Similar criteria exist for reporting icing.

You're helping more than just the pilots around you. Significant reports to ATC go into issuing SIGMETs.

File a Pilot Report (PIREP)

① PILOT
Columbia Radio, Cirrus Eight Eight Seven Two Bravo, two zero west of the Butler VOR, transmitting on one two two point one and receiving over the Butler VOR one one five point niner.

② FLIGHT SERVICE SPECIALIST
Cirrus Eight Eight Seven Two Bravo, Columbia Radio. Go ahead.

③ PILOT
I've got a pilot report for you ... *[pause so the specialist is ready to copy]* ... We're twenty miles west of Butler VOR, seven thousand feet, type SR22. Broken cumulus clouds below us, tops estimated at six thousand. Visibility roughly one zero miles. Temperature zero Celsius. Wind two niner zero at two five. Continuous moderate turbulence. Negative icing. Cirrus Seven Two Bravo.

④ FLIGHT SERVICE SPECIALIST
Cirrus Seven Two Bravo, roger. I copy twenty west of Butler VOR at seven thousand, an SR22 at one eight zero five Zulu. Broken cumulus with tops at six thousand. Flight visibility one zero miles. Temperature zero Celsius. Wind from two niner zero at two five. Continuous moderate turbulence. Negative icing. Is that accurate and complete?

⑤ PILOT
Affirmative. Cirrus Seven Two Bravo.

⑥ FLIGHT SERVICE SPECIALIST
Do you need any updates, adverse conditions, NOTAMs, or weather?

⑦ PILOT
Negative. Thanks.

⑧ FLIGHT SERVICE SPECIALIST
Clinton altimeter two niner seven eight. Additional pilot reports are always appreciated. Enjoy the rest of your flight.

TIP

Reporting the absence of a forecast condition, such as "negative turbulence," can be just as helpful as reporting the presence of the condition.

If you have urgent weather to report while flying IFR, it's best to pass that on directly to the controller: "Kansas City Center, Cirrus Seven Two Bravo, we had light rime ice on climbout, four thousand through seven thousand."

However, if you want to file a full Pilot Weather Report (PIREP) it's best to leave the frequency (page 70), and then file it with Flight Service.

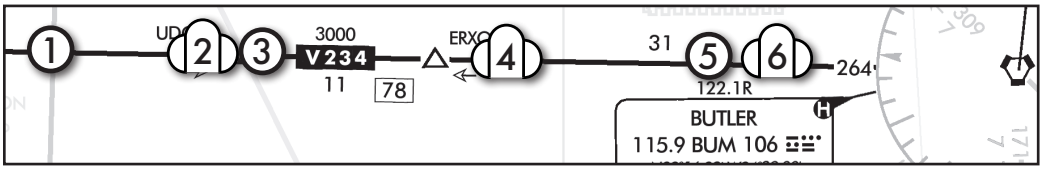
The format for the required parts is:

[Your location], [Time UTC (if you're reporting something that happened in the past), [Your altitude], [Your aircraft type].

Add any of the following (the order isn't critical):

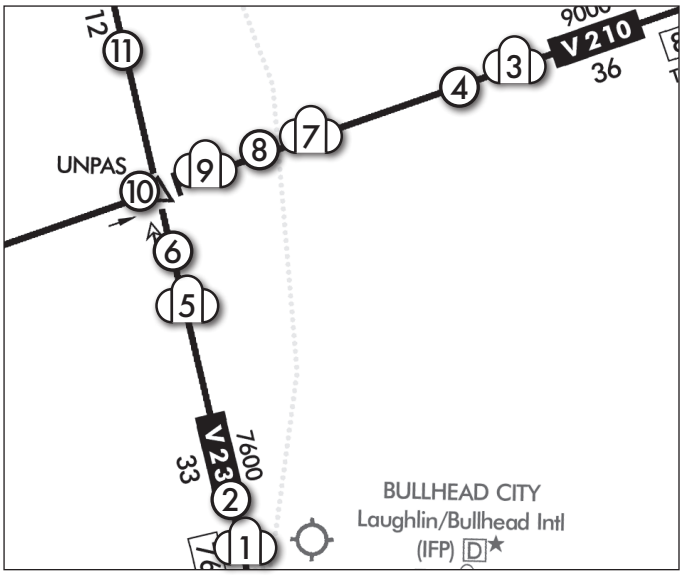
[Cloud coverage/type/height], [Visibility or restrictions to visibility], [Precipitation type and intensity], [Temperature], [Wind direction and speed], [Turbulence], [Icing], [Other pertinent remarks].

Note that location, altitude, and type are only that ③. Don't include your IFR routing, destination, blood type, or life aspirations.



V234 west of BUM
Butler, MO
Columbia FSS 122.1
Butler VOR 115.9

V237 and V210 around UNPAS
Bullhead City, AZ
Los Angeles Center 134.65



When you're flying IFR, ATC issues traffic advisories to make you aware of other aircraft in the vicinity. This is especially true when the other aircraft is VFR and the controller might not even be talking to it. The controller is responsible for separating you from other IFR traffic, and will take steps to avoid conflicts with VFR traffic. Therefore, it's important to know if you see the other aircraft.

In this example, it's possible you and the Bonanza could pass only 500 feet apart, that's close for even comfortable VFR separation. However, once you report the traffic in sight, you can maintain separation.

The controller also assumes the Bonanza pilot won't climb because he's aware of the crossing traffic. If he did (and he's VFR, so he could), the controller would issue a "traffic alert" to the Bonanza, and issue you a vector to ensure nobody's flight "ended prematurely."

When two IFR aircraft are separated by the legal minimum (by 1000 feet below Flight Level 290), controllers point out the traffic:"Traffic ten o'clock, five miles, a Learjet climbing to seven thousand." Sometimes when the distance is greater, they'll call it out anyway. This keep pilots from making avoidance maneuvers when there's no actual conflict.

See "Things Controllers and Pilots Say About Traffic" on page 75 for some of the many phrases you'll hear in use with traffic advisories.

(1) CENTER CONTROLLER
Cirrus Seven Two Bravo, traffic one o'clock, five miles, a Bonanza westbound at seven thousand five hundred.

(2) PILOT
Negative contact. Cirrus Seven Two Bravo.

(3) CENTER CONTROLLER
Bonanza Two Seven Tango, traffic eleven o'clock, five miles, a Cirrus crossing northbound at eight thousand.

(4) BONANZA PILOT
Bonanza Two Seven Tango, looking for the Cirrus.

(5) CENTER CONTROLLER
Cirrus Eight Eight Seven Two Bravo, Bonanza now two o'clock three miles. It appears he'll pass behind you.

(6) PILOT
Traffic in sight. Cirrus Seven Two Bravo.

(7) CENTER CONTROLLER
Cirrus Seven Two Bravo, thank you. Bonanza Two Seven Tango, the Cirrus has you in sight.

(8) BONANZA PILOT
Still looking. Bonanza Two Seven Tango.

(9) CENTER CONTROLLER
Bonanza Two Seven Tango. That Cirrus traffic will pass ahead of you.

(10) BONANZA PILOT
That's good, 'cause I never saw him. Bonanza Two Seven Tango.

(11) PILOT
I paid for the stealth option.

Make an IFR Position Report

(1) CENTER CONTROLLER
Cirrus Seven Two Bravo, I'm going to lose you on radar shortly. Report SETTA.

(2) PILOT
OK, we'll report SETTA. Cirrus Seven Two Bravo.

(3) CENTER CONTROLLER
Cirrus Seven Two Bravo, radar contact lost.

(4) PILOT
Roger. Cirrus Seven Two Bravo.

If you hear ATC say, "radar contact lost," there's no reason to panic. It simply means your data no longer appears on the controller's radar display, or is no longer reliable. This could be due to your altitude, an area of poor radar coverage, equipment failure, or even certain weather conditions.

If you don't appear on the scope, ATC can't provide radar services, and the only way to track your progress is by you making position reports (5).

Position reporting is a holdover from the early days of instrument flying when there was no radar at all. Today, position reporting is only routine when out of radar coverage, such as over an ocean.

The critical items to report are position and altitude (5). The format is:

> [ATC Facility], [Call sign] over [Reporting point], [Altitude].

(5) PILOT
Houston Center, Cirrus Seven Two Bravo is over SETTA, two thousand.

(6) CENTER CONTROLLER
Cirrus Seven Two Bravo, roger. Report JOHON. I should pick you up before then, though.

(7) PILOT
Report JOHON. Cirrus Seven Two Bravo.

(8) CENTER CONTROLLER
Cirrus Seven Two Bravo, ident and say altitude.

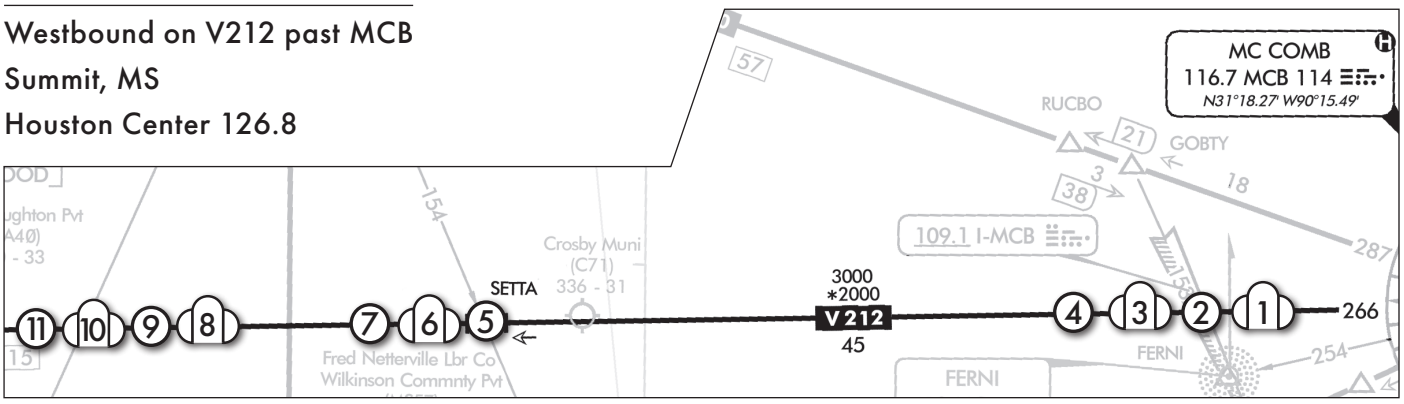
(9) PILOT
Two thousand. Cirrus Seven Two Bravo.

(10) CENTER CONTROLLER
Cirrus Seven Two Bravo, radar contact, twenty three miles southwest of Natchez.

(11) PILOT
Roger. Cirrus Seven Two Bravo.

Technically, you must report over any compulsory reporting points whether ATC requests it or not. These are solid color VORs or fixes on the Enroute Chart. There aren't many in most of the U.S., and ATC probably isn't expecting reports they didn't ask for, but reporting them is the rule. Once back on radar (10), you can discontinue the position reports.

Westbound on V212 past MCB
Summit, MS
Houston Center 126.8



THINGS CONTROLLERS AND PILOTS SAY ABOUT TRAFFIC

You'll hear all sorts of official and informal phraseology when it comes to traffic. Here are a few:

"Not talking to him" is what the controller might say about a target on the radar scope who isn't communicating with ATC. This happens often when you're flying IFR in visual conditions.

"Altitude indicates" means the controller sees an altitude on the radar scope, but isn't talking to the pilot, so there's been no check that's the altitude the pilot sees. It might be combined in a single callout, "Traffic one o'clock, two miles, two thousand, unverified." You might also hear, "**altitude unknown**," with an obvious meaning.

"Appears to be maneuvering" is a common phrase when the target isn't flying straight and level. This could be turning and/or changing altitude.

"No longer a factor" is what you might hear after traffic was called for you, you never reported it in sight, and now it's past and a non-issue.

"No factor" is the pilot's way of saying the traffic is not an issue. This is especially helpful when the controller doesn't know the altitude of the traffic. The call might be, "Salt Lake Center, Cirrus Seven Two Bravo has traffic, no factor."

"No joy" isn't proper phraseology but you'll hear it to say, "I haven't seen the traffic yet."

"Got him on the fish finder" might make some people feel suave, but really makes folks roll their eyes. No one cares if you have the target on your traffic display. You either see it with your eyes or don't, and that's what you report.

"We're in IMC" is a helpful response when you get a traffic callout from ATC, because you clearly can't see any traffic. However, there *shouldn't* be a target in the clouds the controller isn't talking to, so—hopefully—altitude unknown or unverified targets cease to be a concern.

"Report that traffic in sight" means exactly what it says and may precede **"Maintain visual separation with that traffic."** The latter is used in visual conditions to allow tighter spacing than would otherwise be allowed under IFR.

RESUME NORMAL POSITION REPORTING

If you'll be out of radar contact for a long time, such as with a widespread radar outage or oceanic travel, you must provide detailed reports. Hearing, "Resume normal position reporting," is your cue to follow AIM (5-3-2). The format is:

> [ATC Facility], [Call sign] over [Reporting point] at [Time], [Altitude]. Estimating [Next reporting point (if applicable)] at [Estimated time], [Next reporting point (if applicable)] next. [Remarks (such as ride report or fuel remaining)].

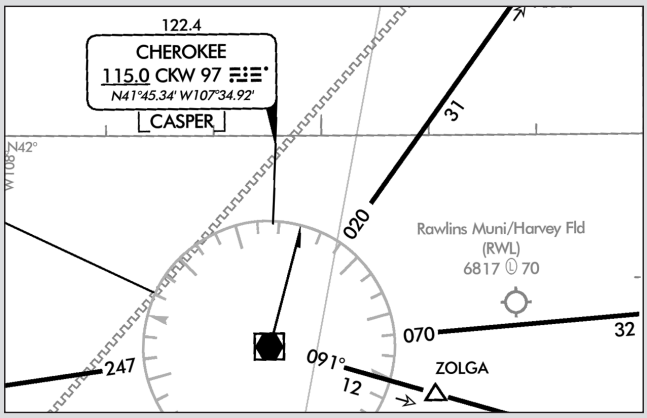
An example might be:

> Denver Center, Cirrus Eight Eight Seven Two Bravo, over Cherokee at 13:05 Zulu, 11,000. Estimating Hayden at 13:30 Zulu, Landing at Hayden.

The detailed reports are needed because controllers are now juggling multiple aircraft while following non-radar control procedures regarding routing, altitude, and in-trail separation.

Here's a tip to help remember the format of a position report. It's: FTA - FT - F. That's fix/time/altitude - fix/time - fix.

Some reports are always required. See "Required Reports When Flying IFR" on page 118.

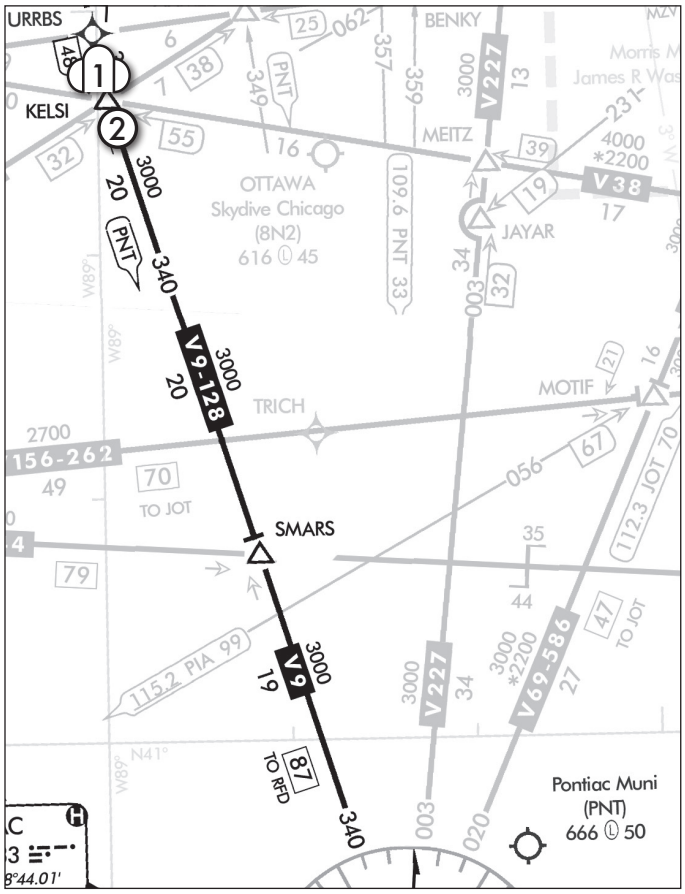


Receive an Altitude Change at Pilot's Discretion

① CENTER CONTROLLER
Cirrus Eight Eight Seven Two Bravo, descend at pilot's discretion. Maintain three thousand.

② PILOT
Pilot's discretion, descend and maintain three thousand. Cirrus Eight Eight Seven Two Bravo.

Southbound on V9
East of Peru, IL
Chicago Center 123.75



TIP

You can request pilot's discretion on any climb, or descent, as well. This is handy when you want to hold your altitude as long as possible, then zoom through a layer of potential icing or turbulence, or through a hole in a broken layer.

Standard climb and descent clearances don't give you any flexibility. ATC expects that you'll promptly climb, or descend, at an optimum rate for your aircraft (page 56).

However, when a climb or descent clearance includes the words "pilot's discretion," you can start the climb or descent whenever you want, make it at any rate, and temporarily level off at any intermediate altitude along the way. The only restriction is that once you leave an altitude, you may not return to it. You don't need to tell the controller the reasons behind your decisions, either.

In this example, the controller sees no traffic conflicts between your present position at 9000 feet and your eventual instrument approach into Pontiac, so it's left to you when and how to reach 3000 feet ①.

The format for an altitude change at pilot's discretion is:

> [Call sign], [Climb/descend] at pilot's discretion. Maintain [Altitude].

A pilot's discretion descent may be combined with a standard descent clearance. "Descend now to seven thousand, then descend at pilot's discretion maintain three thousand," means promptly descend at an optimum rate to 7000 feet, and then however you want down to 3000 feet.

If you receive a descent clearance that includes a crossing restriction, pilot's discretion is implied (page 56). This is common when the descent is part of an approach clearance: "Cross SMARS at 3000, cleared RNAV Runway 6 approach," means "Descend at pilot's discretion to 3000, but be sure you reach exactly 3000 as you cross SMARS, then you're cleared for the approach."

This situation is where the VNAV feature of your GPS, or mental math, comes in handy if you want that profile to resemble a straight line, rather than a staircase.

There's no requirement to report leaving an altitude during a pilot's discretion altitude change,unless the controller adds "report leaving [altitude]," but it's arguably good etiquette, especially if you wait a while before descending. "Cirrus Seven Two Bravo leaving 9000 for 3000."

It's possible to file a Standard Terminal Arrival Route (STAR) for your destination when you file your IFR flight plan. You might receive a published arrival as part of your route when you get your initial IFR clearance, even if you didn't file it.

It's also possible—and increasingly common for high-performance piston aircraft—to receive a STAR on the fly as you approach your destination. This is an amendment to your route, so it could come as a segment you'll fly later in your flight (page 68), or part of a clearance to immediately join the arrival ①. Instructions to join an arrival might include other instructions, such as new altitude, but it doesn't have to.

Just like with a published departure, the entire route of the arrival becomes part of your IFR clearance. You're expected to fly the published route and comply with any restrictions. However, arrivals without restrictions, such as the Riced Four, never use the "Descend via" phraseology (page 78). They can't; no altitude restrictions mean there's no way for you to know when to descend. The arrival might show altitudes to expect, which is helpful for planning purposes. (If the arrival is an RNAV arrival, it's more likely to have altitude restrictions.)

The routing of the arrival may be inconvenient, but even if you turn it down, you'll likely get vectors on the same general route ... or worse. Note the location of any holds in case you get a delay there, and how the arrival terminates. Many end in flying a heading that depends on the destination runway in use. Be sure you read through the entire procedure, and know exactly where you're expected to go.

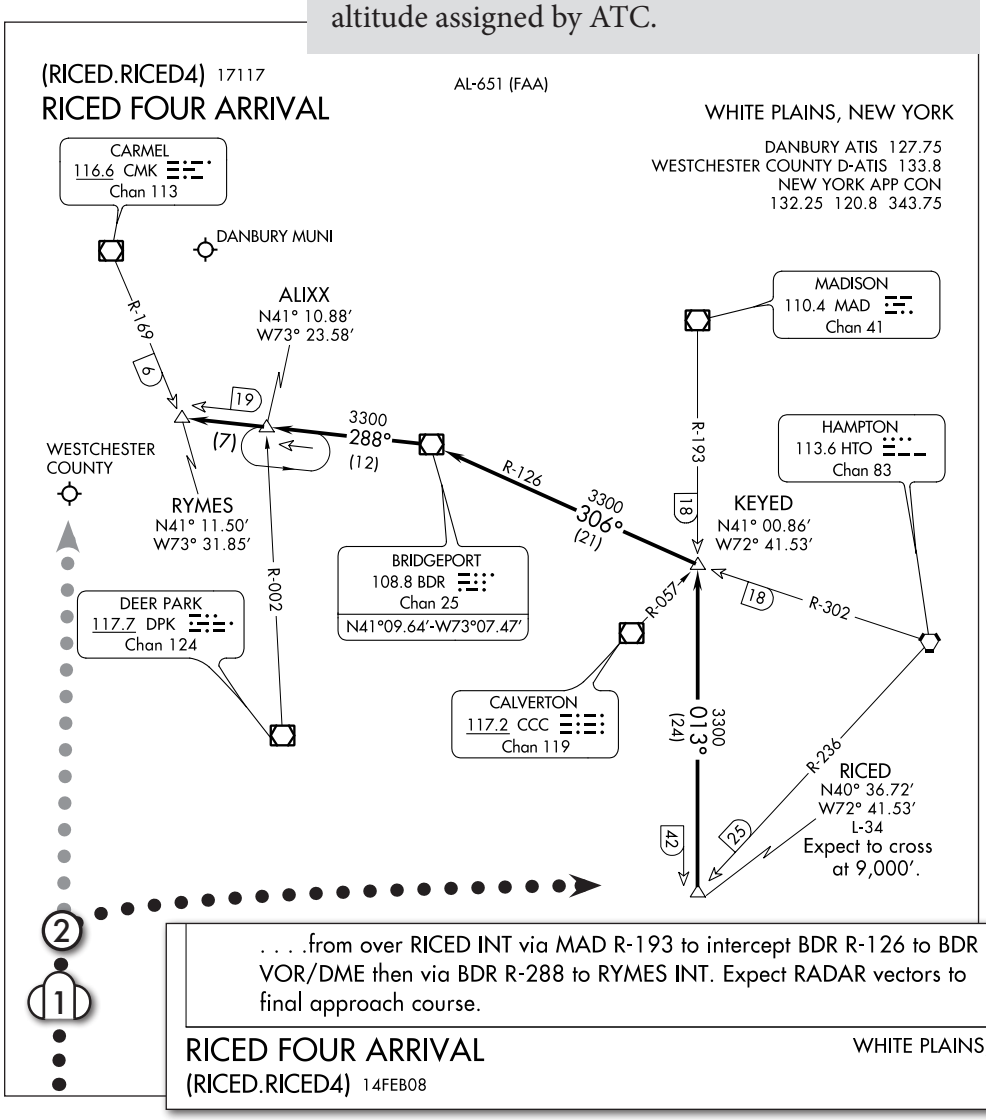
Direct White Plains (KHPN)
Out over the water, NY
New York Approach 135.25

① APPROACH CONTROLLER
Cirrus Eight Eight Seven Two Bravo, cleared direct RICED, RICED FOUR arrival, descend and maintain niner thousand.

② PILOT
Direct RICED, RICED FOUR arrival. Leaving one one thousand for niner thousand, Cirrus Eight Eight Seven Two Bravo.

TIP

The altitudes along the legs of an arrival, such as 3300 feet between RICED and KEYED, are *not* altitudes to fly. They are MEAs. Always fly the altitude assigned by ATC.



Receive a "Descend Via" Clearance

① APPROACH CONTROLLER
Cirrus Eight Eight Seven Two Bravo, descend via the DEVYN TWO arrival, expect Runway Three Four Left. Spokane altimeter two niner niner five.

② PILOT
Descend via the DEVYN TWO arrival, expect Three Four Left. Two niner niner five. Cirrus Eight Eight Seven Two Bravo.

TIP

Like SIDs, STARs may have transitions. The DEVYN TWO could start at FRZBY or TUNNL for a transition to DEVYN, or at DEVYN itself.

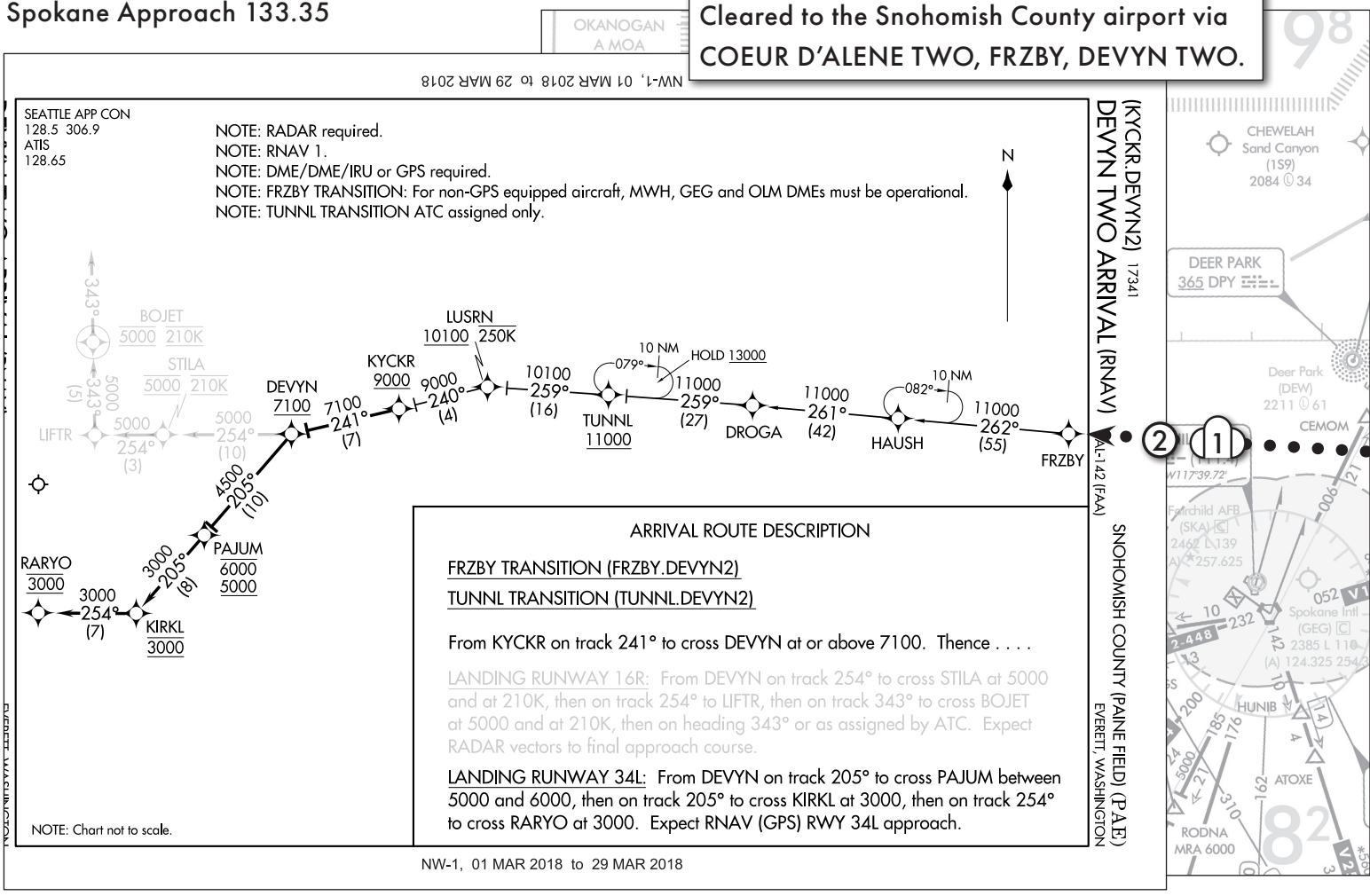
If a controller tells you to "Descend via" a STAR ①, it means the STAR has altitude restrictions at specific waypoints. You should follow the STAR's lateral path, and descend at pilot's discretion to meet any published altitude restrictions along the way. If you were at 12,000 feet in this example, you'd descend step-by-step without further instruction to reach 3000 feet at KIRKL. That's the bottom altitude for this STAR when landing north. Unless ATC steps in to separate you from other traffic, the only communication will likely be handoffs. Note that ATC may not change the landing runway for an aircraft less than 10 NM from the "fork in the road," which is DEVYN in this case.

STARs with multiple altitude restrictions are usually designed for a steady stream of jets and turboprops running down the same funnel. If you're slower than everyone else, expect some vectors off the STAR or requests to "keep your speed up."

DEVYN TWO arrival for Paine Field (KPAE)
Spokane, WA
Spokane Approach 133.35

CLEARED ROUTE

Cleared to the Snohomish County airport via COEUR D'ALENE TWO, FRZBY, DEVYN TWO.



The "Descend via ... except" clearance is a "Descend via" clearance (page 78) with an amendment to the published procedure. It can be used to change altitude restrictions ("... except cross YLSTN at or above one four thousand"), or speed restrictions ("... except after GRYNT maintain one eight zero knots"), or even headings ("... except depart GRYZZ heading zero five zero."). Basically, do as you're told.

When you check in on a STAR, the new controller needs to know all the conditions you think are in effect, so you check in with altitude and that you're descending via the STAR ③. The new controller needs to adjust things, so you get the exception ④.

It's appropriate to include the airport information if you have it ③. You don't need to state the landing runway if you know it, even if the center controller told you the runway to expect. The approach controller is responsible for assigning a landing runway. Read back a "Descend via" clearance verbatim, including amendments and the runway transition, if assigned. (If *Approach* tells you to expect a runway, that's something to read back on every handoff.)

There is potential for confusion, however. Does "... except after GRYZZ" mean you must still cross GRYZZ at 9000 feet, or was the crossing altitude changed to 8000 feet? It's the former. If you were supposed to cross GRYZZ at 8000 feet, the clearance would have been, "... except *cross* GRYZZ ..." rather than "... except *after* GRYZZ ..." However, if you're in doubt, ask.

YLSTN TWO approaching GRYNT
Bridger, MT
Salt Lake Center 133.25
Billings Approach 120.5

TIP

Speed restrictions on a published arrival apply whenever you're flying the arrival, whether it was just in your clearance or issued as a "descend via."

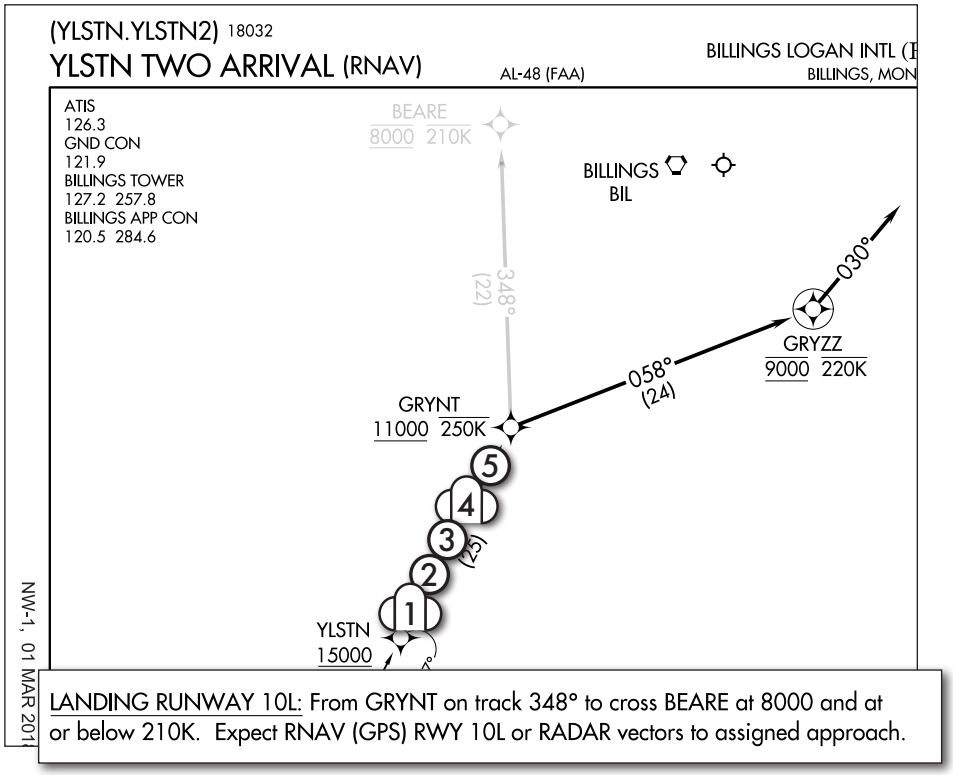
① CENTER CONTROLLER
Cirrus Seven Two Bravo, contact Billings Approach on one two zero point five.

② PILOT
Billings Approach on one two zero point five. Cirrus Seven Two Bravo.

③ PILOT (on 120.5)
Billings Approach, Cirrus Eight Eight Seven Two Bravo, descending via the Yellowstone Two arrival. Passing thirteen thousand five hundred. We have Billings information Mike.

④ APPROACH CONTROLLER
Cirrus Seven Two Bravo, descend via the Yellowstone Two, landing west, except after GRYZZ, maintain eight thousand.

⑤ PILOT
Descend via the YLSTN TWO arrival, landing west, except after GRYZZ, maintain eight thousand. Cirrus Seven Two Bravo.



DESCENDING VIA THE STARS

Much of the communication when flying a STAR mirrors that for flying a SID. (See "SID Terminology" on page 17, and "SID Phraseology" on page 33.) That means "Descend via" instructions—and their accompanying traps—are similar.

"Cleared [STAR name] arrival," is clearance to fly the lateral guidance for a procedure, and requires you to meet all speed restrictions. However, it is not clearance to descend.

"Descend via ..." is clearance to descend, following all published altitude and speed restrictions all the way to the lowest mandatory altitude on the route. This is the bottom altitude. Unlike a SID, where there's a box labeled "top altitude," you have to search along the route to find a bottom altitude. You may be given a landing direction, as many arrival routes bifurcate at some point, to serve opposite runways.

Note that "Descend via" won't be issued on STARs where there are only "expect" altitudes. Those are only for planning. Note that a published expect altitude is not an "expected" in the case of lost comms, unless ATC actually told you to expect that altitude. Just like a SID, you should check in that you are, **"Descending via the [procedure name] arrival, landing [direction]."** Only include landing direction if it was part of your clearance issued by Approach (as opposed to something Center told you to expect).

"Descend via ... except" is analogous to SID in that it only affects the bottom altitude. "Descend and maintain" means all intervening altitude restrictions are canceled. Altitude amendments don't remove speed restrictions, just like on a SID.

Vectors off a STAR and back onto it follow the same conventions as a SID, as do requests for deviations around weather.

ALTITUDE BUSTS BY GEORGE

If you fly with a flight management system or high-end autopilot, be careful when you get an assigned altitude on a STAR. Sometimes when resuming the STAR, the system descends uninterrupted to the bottom altitude. Other times it's close enough to a stepdown fix to advance to the next leg before actually crossing the fix. Either one would be a pilot deviation, and a potential phone call with the FAA.

SPEED LIMITS

How fast can ATC ask you to go? No faster than 250 knots indicated airspeed below 10,000 feet MSL. The limit is 200 knots indicated airspeed beneath the shelf of a Class B airport, or below 2500 feet AGL within 4 NM of a Class D or C airport.

There are minimum speeds ATC can ask for as well, but they're still pretty fast. If your airplane has a prop (or two), ATC can't ask for slower than 150 knots on departure, or on arrival and within 20 miles of the runway. The minimum is 200 knots otherwise. That doesn't mean you can't *fly* less than 150 knots; it only means the controller can't request less. (If you're lucky enough to be flying a jet, the minimums are 170-230 knots, depending on the situation.) However, ATC can override any limits other than the 250-knot one for "operational advantage." If a controller asks you to go faster or slower than any of these limits, or a speed you feel compromises safety, you can refuse.

As a GA pilot it's more likely that the constraint will be your airplane, not the regs. You may find yourself responding to a request of 150 knots with, "Unable one five zero knots," or "The best we can give you is one three zero knots."

If you lend a hand by keeping your speed up, watch for the thrill of high-speed flight devolving into fear of a high-and-hot approach. Tell ATC ahead of time when you need to slow down.

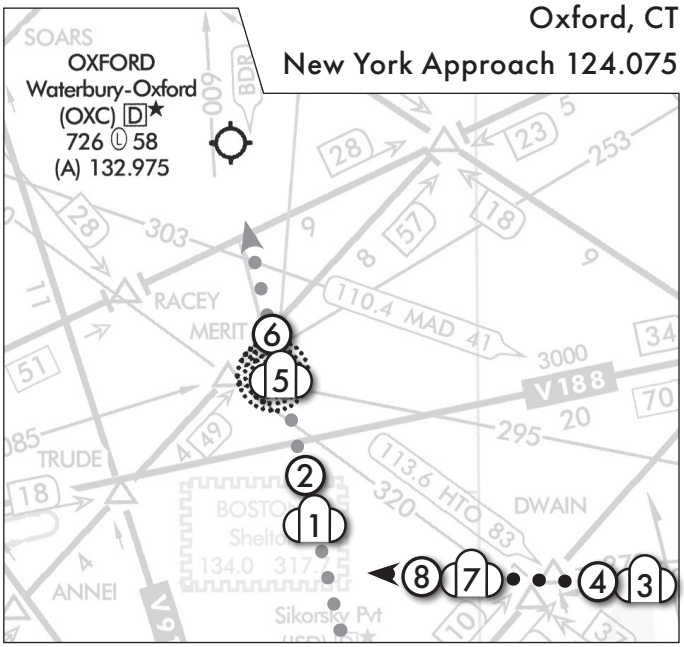
Speed adjustments are one of the last tools a controller uses in keeping separation between aircraft. However, when aircraft must follow the same route and altitude as they approach a common destination, sometimes airspeed adjustments are the best tool for the job. The format of a basic speed adjustment is the same whether it's enroute or during approach:

> [Call sign], reduce/increase speed to [Speed].

Speed adjustments are given in five-knot increments (or .01 Mach above FL230), and the expected tolerance is ± 10 knots (or ± .02 Mach). You may be told to maintain a speed "or greater," or not to exceed a particular speed. You could be told to increase or decrease by a certain number of knots. Sometimes it's simply, "Maintain maximum forward speed," "Maintain best forward speed," "Maintain slowest practical speed," or even an informal, "Keep your speed up." If you hear that, responding, "We are doing 110 knots, what speed do you want?", would be appropriate.

Most controllers understand it's tough to slow down and go down simultaneously, so they may prioritize: "Descend and maintain six thousand, then reduce speed to one five zero," or "Reduce speed to one five zero, then descend and maintain six thousand." A speed adjustment given in conjunction with a crossing restriction means you descend to the crossing altitude first, and then reduce speed.

In sequence for Oxford Airport (KOXC)
Oxford, CT
New York Approach 124.075



(1) APPROACH CONTROLLER
Warrior Eight Six Seven Five Uniform, say airspeed.

(2) WARRIOR PILOT
One one zero knots, which is pedal-to-the-metal for us. Warrior Eight Six Seven Five Uniform.

(3) APPROACH CONTROLLER
Cirrus Eight Eight Seven Two Bravo, reduce speed to one one zero. You're following a Warrior.

(4) PILOT
Reduce speed to one one zero. Cirrus Eight Eight Seven Two Bravo.

(5) APPROACH CONTROLLER
Warrior Seven Five Uniform, contact Tower one one eight point four seven.

(6) WARRIOR PILOT
Tower one one eight point four seven, Warrior Seven Five Uniform.

(7) APPROACH CONTROLLER
Cirrus Seven Two Bravo, resume normal speed.

(8) PILOT
Resume normal speed. Cirrus Seven Two Bravo.

"Resume normal speed," (7) means speed is your discretion, so long as you comply with any published speed restrictions. However, "Resume own navigation" after you've been receiving radar vectors, does not cancel any assigned speed restrictions. Lucky for pilots, an approach clearance cancels assigned speed restrictions, unless the controller restates them. Once you're inside the final approach fix or five miles from the runway, ATC won't give you a speed adjustment.

Receive Holding Instructions

(1) APPROACH CONTROLLER
Cirrus Eight Eight Seven Two Bravo, expect a delay due to weather passing northeast of Atlantic City. I have holding instructions for you. Advise ready to copy.

After you sigh despondently, and find a pen ...

(2) PILOT
Ready to copy. Cirrus Eight Eight Seven Two Bravo.

(3) APPROACH CONTROLLER
Cirrus Eight Eight Seven Two Bravo, cleared to the Sea Isle VOR on Victor Forty-four, hold west, expect further clearance two zero three zero Zulu. Time now two zero one zero Zulu.

(4) PILOT
Hold west of Sea Isle on Victor Forty-four. Expect further clearance two zero three zero. Cirrus Eight Eight Seven Two Bravo.

(5) PILOT
Atlantic City Approach, Cirrus Eight Eight Seven Two Bravo, entering the hold at Sea Isle at two zero one three, seven thousand.

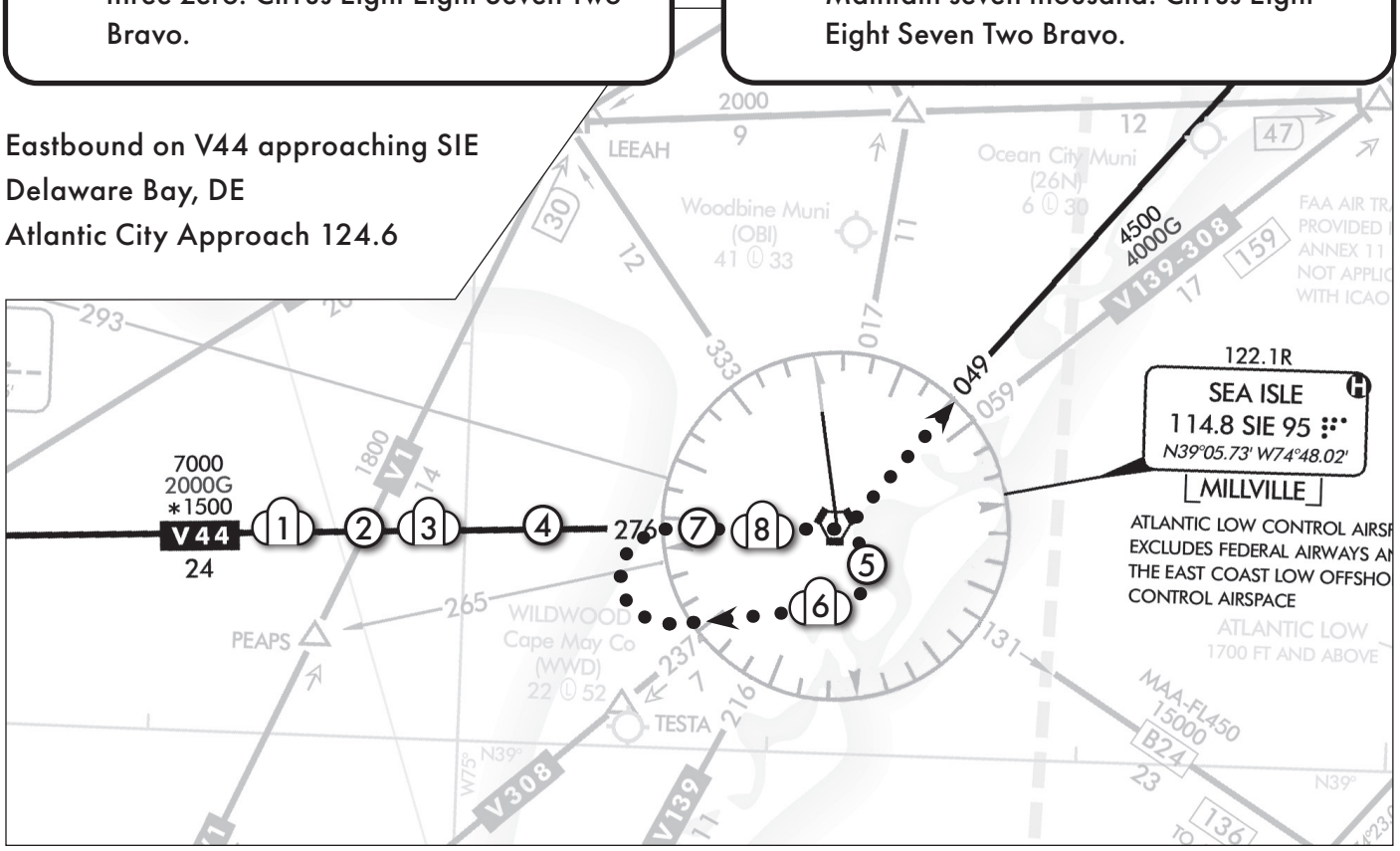
(6) APPROACH CONTROLLER
Cirrus Eight Eight Seven Two Bravo, roger.

As your EFC time of 2030Z approaches ...

(7) APPROACH CONTROLLER
Cirrus Eight Eight Seven Two Bravo, sorry about the delay, things just opened up again. Cleared to the East Hampton Airport via direct Sea Isle VOR, then last routing cleared. Maintain seven thousand.

(8) PILOT
Okay thanks. After Sea Isle, cleared to East Hampton via last routing cleared. Maintain seven thousand. Cirrus Eight Eight Seven Two Bravo.

Eastbound on V44 approaching SIE
Delaware Bay, DE
Atlantic City Approach 124.6



Holds assigned by ATC are pretty rare in today's airspace. The least common, and most challenging, is an unpublished hold. More common are published holds (See "Hold as Published", this page), which are both easier to visualize and allow simpler phraseology. If you can master the communication for unpublished holds, the published ones are a snap.

A controller's holding instructions provide everything you need to know to fly the unpublished pattern ③, so the format can be complex:

> [Call sign], cleared to [fix], hold [Direction from fix (N, NE, E, SE, etc.)] of [Holding fix] on the [Radial, course, bearing, airway, or route on which to hold]. [Leg length in miles or minutes] legs (if non-standard). Left turns (if applicable) . Expect further clearance at [Future time], time now [Current time] (times optional).

There is critical information left unsaid. ATC won't mention the direction of turn if it's the standard right turns. The controller won't specify an inbound leg length if it's the standard: a one-minute below 14,000 feet, 1.5-minutes above 14,000 feet, or 4 NM for DME/GPS holds. Unless a new altitude is included in the holding clearance, you maintain the last assigned altitude (7000 feet in this case).

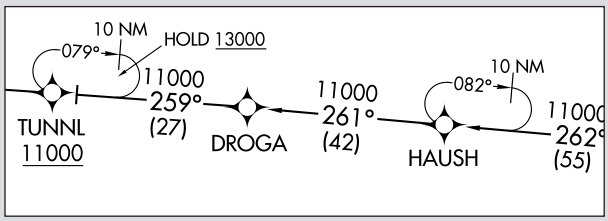
Entering a hold is a required report even in radar contact ⑤:

> [Facility], [Call sign] entering the hold at [Holding fix] at [Time], [Altitude].

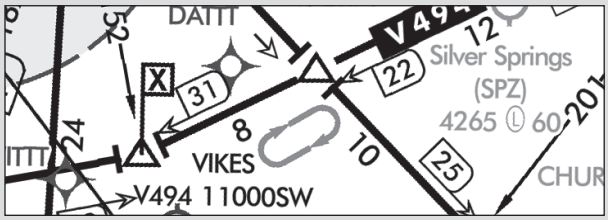
ATC usually issues an "expect further clearance" (EFC) time with holding instructions ③, but may replace that with, "no delay expected." If you don't get an EFC, you can ask for it. The EFC is in case you lose communication entirely. If the EFC time arrives and you haven't heard from ATC, check to see if the problem is lost comm or just misplaced controller attention. The formal way is to ask for further clearance, but a polite, "Atlantic City Approach, Cirrus Seven Two Bravo, holding over Sea Isle, just checking to see if we were forgotten," will also do the trick. If you're lost comm and have no EFC, you proceed on.

HOLD AS PUBLISHED

The second most common hold for GA pilots are ATC-assigned holds as published holds on approach charts or STARS. You might get instructions to hold at the initial approach fix for an approach to a non-towered airport while waiting for the aircraft ahead to cancel IFR. You might get put in a hold on an arrival if the airport is overloaded with incoming traffic, or the landing runway is changing.



Less common are the holding patterns published on Enroute Charts, where ATC sticks you for a while to wait out weather or traffic issues up ahead.



The instructions to fly a published hold follow a simple format:

> [Call sign], cleared to [fix], hold as published. Expect further clearance at [Future Time], time now [Current Time] (times optional).

Published holds are easier to visualize and fly, since they're shown right there on the chart. They're usually direct entry if they're enroute or arrival holds.

What's the most common hold GA pilots fly? The ones they do for IFR currency and by their own request. This brings up an interesting point: You can ask for a hold at some fix to buy yourself extra time or wait out weather at the airport you'd rather not challenge. You can also ask for modifications to hold if it keeps you too close to weather or icing conditions.

Receive a Vector off a Procedure

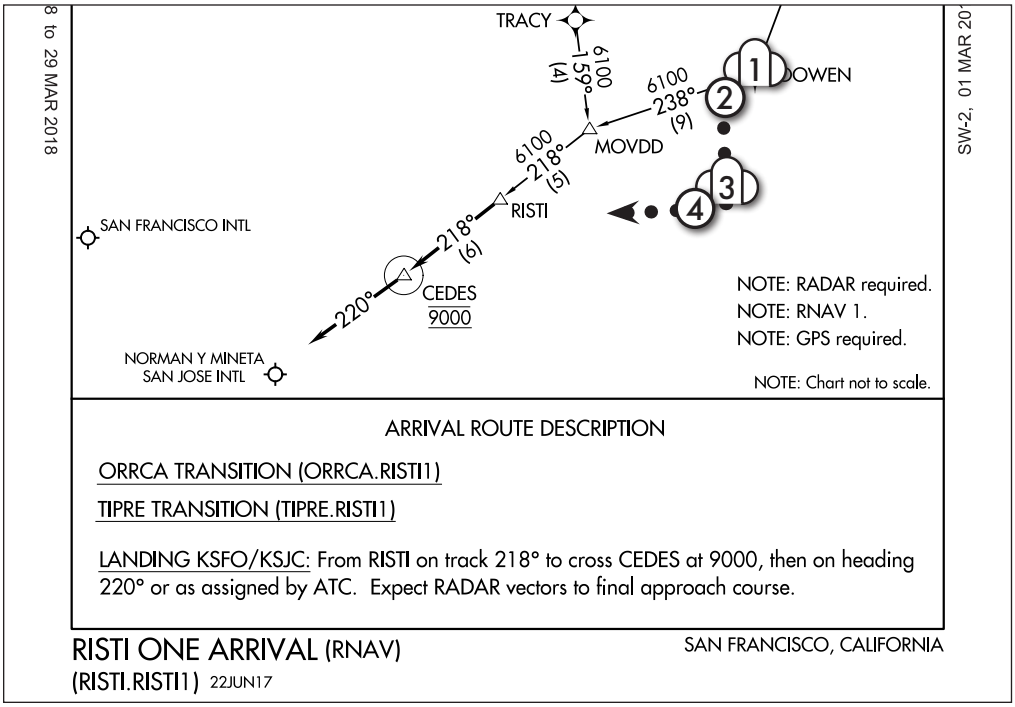
(1) APPROACH CONTROLLER
Cirrus Eight Eight Seven Two Bravo, turn left heading one seven zero, vector for spacing. Maintain one zero thousand. Expect to resume the RISTI ONE arrival.

(2) PILOT
Turn left heading one seven zero. Maintain one zero thousand, Cirrus Eight Eight Seven Two Bravo.

(3) APPROACH CONTROLLER
Cirrus Eight Eight Seven Two Bravo, proceed direct RISTI, cross RISTI at one zero thousand, descend via the RISTI ONE arrival.

(4) PILOT
Direct RISTI, cross RISTI at one zero thousand, descend via RISTI ONE, Cirrus Eight Eight Seven Two Bravo.

Descending via the RISTI ONE Arrival
Tracy, CA
NorCal Approach 134.5



The most important thing to remember about vectors off a STAR (or SID) is that the vector cancels previous clearances.

If you were descending via (or climbing via) a published procedure with altitude restrictions, the controller must give you an altitude to maintain and a heading to fly to replace the courses and altitudes in the procedure (1). Speed restrictions are also canceled unless restated.

If you were flying a procedure without altitude restrictions, the vector could be a heading and would maintain your last assigned altitude. In either case, the controller should give the reason for the vector.

Once the needed spacing is achieved, ATC could continue to vector you, or have you rejoin the procedure. If the procedure has crossing restrictions, and the fix you're cleared to doesn't have a published altitude restriction, ATC will assign a crossing altitude (3). Because this clearance has "descend via," after RISTI, you would follow the vertical and lateral guidance of the STAR. If the controller had sent you to CEDES, the altitude would not have to be stated, because you must cross CEDES at 9000 feet, so it would be assumed as pilot's discretion to 9000 feet.

If the procedure had no altitude restrictions, the clearance would have been direct to a fix and "... resume the [procedure name] arrival." You would follow the STAR lateral guidance and rely on ATC for altitudes.

Much of the terminology for vectors off and on a STAR are the same as in "Vectors Off and Back onto a SID" on page 35.

TIP

Whether the controller tells you to "expect to resume" the arrival or not, don't sequence your GPS beyond the STAR if there's a chance you might be vectored back onto it.

IFR opens the door to flying in the weather, but it imposes limitations: stricter fuel requirements, greater separation from terrain, inflexible routes in some airspace, and so on. For this reason, you may wish to cancel IFR, and revert to VFR part way through a flight. The format is simply:

[Facility name], [Call sign], Cancel IFR.

If you wish to stay with ATC for VFR flight following, add that request with your cancelation. The controller will confirm this with, "IFR cancellation received," and either have you stay on your current squawk code for VFR advisories, or squawk 1200.

You can cancel IFR at any point during a flight, even during an instrument approach. However, when your destination is a towered airport, there's usually no advantage to canceling before you land. When the destination is a non-towered airport, however, there can be several advantages to you and others. (See "Canceling Your IFR Flight Plan Without a Tower" on page 95.)

Another reason to cancel IFR early is if your destination has no published approach. Yes, you can file IFR to a VFR-only airport, presuming you can descend from the MEA to the airport in VFR conditions. In this example, you request a descent to the MEA ①, and then cancel IFR once you're in visual conditions ④. Having the destination in sight isn't required, but at least its on record if you go missing after the IFR cancellation.

That's only partly said in jest. Canceling IFR and squawking VFR is the "nuclear option." You're now bound by VFR cloud and visibility requirements, and if you needed to go back into the clouds, you would need a completely new clearance. Consider some of the other options presented here before canceling IFR, or see if you can keep VFR flight following to your destination.

① PILOT
Salt Lake Center, Cirrus Seven Two Bravo, request descent to the MEA of ten thousand four hundred to try and reach visual conditions for landing Malad City.

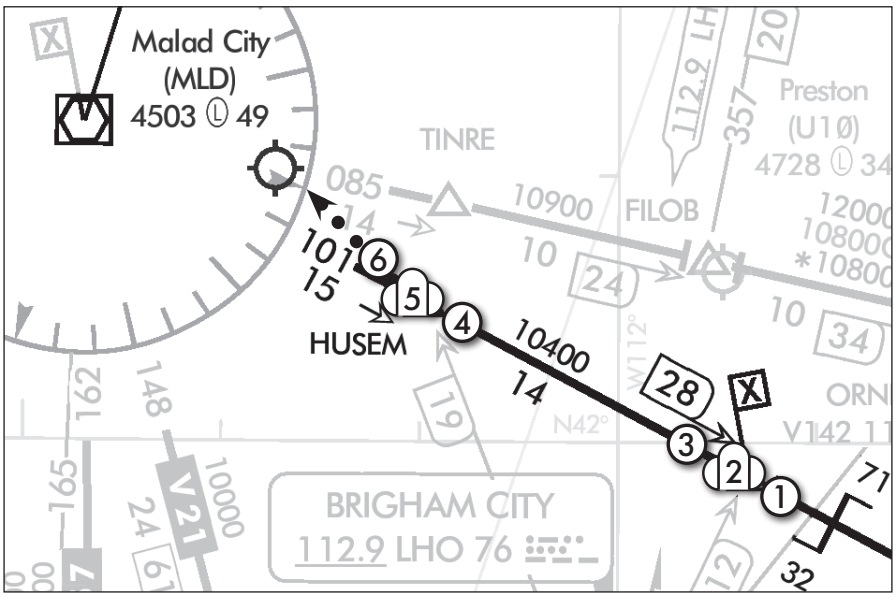
② CENTER CONTROLLER
Cirrus Seven Two Bravo, descend and maintain ten thousand four hundred.

③ PILOT
Leaving twelve thousand for ten thousand four hundred. Cirrus Seven Two Bravo.

④ PILOT
Salt Lake Center, Cirrus Seven Two Bravo, we have Malad City in sight. cancel IFR.

⑤ CENTER CONTROLLER
Cirrus Eight Eight Seven Two Bravo, IFR cancellation received. Squawk VFR. Frequency change approved. Have a good day.

⑥ PILOT
Squawk VFR, frequency change approved. Cirrus Seven Two Bravo.



Malad City Airport (KMLD)
Malad City, ID
Salt Lake City Center 127.7

Request a Cruise Clearance

① PILOT
Seattle Center, Cirrus Seven Two Bravo, request cruise clearance.

2 CENTER CONTROLLER
Cirrus Seven Two Bravo, cruise one zero thousand. Quiet day on the coast.

③ PILOT
Cruise one zero thousand. I figured it wouldn't be a problem. Thanks. Cirrus Seven Two Bravo.

The cruise clearance is rarely requested, and almost never assigned, yet it's perhaps the most efficient of clearances. It's like a block altitude and an approach clearance all wrapped up in one. For that reason, it's only granted to aircraft flying in areas where, or at times when, traffic between the aircraft and its destination is non-existent. The request is:

> [Facility], [Call sign], request cruise clearance.

The clearance format is deceivingly simple:

> [Call sign], cruise [Altitude].

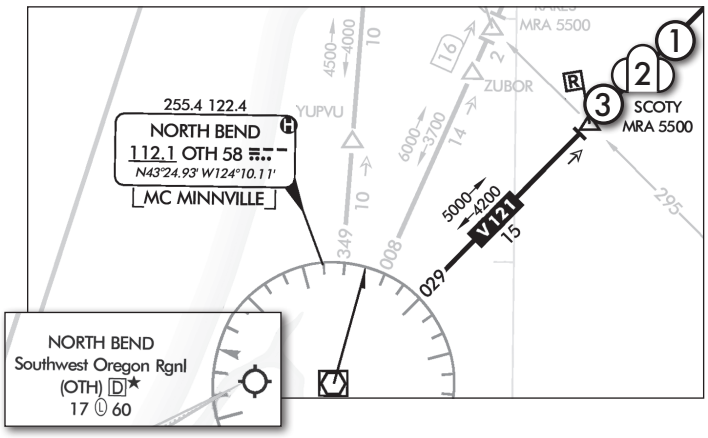
This brief phrase clears you to fly any altitude from the one in your clearance down to the MEA or MOCA for the airway, select any approach you want at the destination, and fly that approach—all without any further permission from ATC. (Now you see why you won't get a cruise clearance to a towered airport, or somewhere like the L.A. Basin.)

Before you start the approach, you can level off at any intermediate altitude, and you can climb or descend within the block at your discretion. The only caveat is that if you report leaving an altitude, you can't return to it without a further clearance.

TIP

Presuming your destination is a non-towered airport, don't forget to close your IFR flight plan with a cruise clearance. You're still IFR, even though you haven't talked to ATC for 30 minutes.

Southwest-bound on V121 approaching SCOTY
Over Elliot State Forest (a.k.a. The Sticks), OR
Seattle Center 121.4



One use of a cruise clearance is when the weather is marginal at the destination and there isn't a favorable instrument approach. North Bend has only precision approaches from the southwest. As you approach North Bend, the MEA drops to 4200 feet. If you cross the VOR and think you can make a contact approach (page 100) to the airport you can simply land. If you're over the VOR and you don't like what you see, pick the best approach and fly it as you see fit.

When the destination airport doesn't have an instrument approach, the cruise clearance can still be helpful as it lets you choose when to descend to the MEA and find VFR conditions to cancel IFR, descend further, and land.

If you request a cruise clearance while on an unpublished route, ATC will assign a crossing altitude with the cruise clearance to ensure obstruction clearance until you enter a published route. The format is:

> [Call sign], cross [Fix] at or above [Crossing altitude], cruise [Altitude].

If you leave a published route on a cruise clearance, maintaining the minimum IFR altitude is your responsibility. The OROCA for your current quadrant would ensure that, but you might be able to go much lower. FAR 91.177 states you only need 1000 feet above the highest obstacle within four NM of your course (2000 feet in mountainous areas).

When conditions at your destination are marginal, or there's more than one published instrument approach, you'll get a heads up as to which approach to expect. The simplest way is via the ATIS for that airport (page 10). The controller will also tell you the approach in use, and will often ask if you have the current ATIS information.

A controller telling you which approach to "expect" ② isn't a clearance. It's subject to change due to weather, winds, and runways in use.

Whatever approach ATC has in mind, you can request a different one. Reasons might include your comfort level flying a particular type of approach, your airplane's capabilities (equipment or climb rate for the missed approach), weather along the approach path, or equipment at the airport. Or, you may just want to practice flying a specific approach.

Simply ask for what you want ③. There's no need to state a reason, if it's a request. You should tell the controller why if you simply can't accept an approach, such as your onboard equipment is broken.

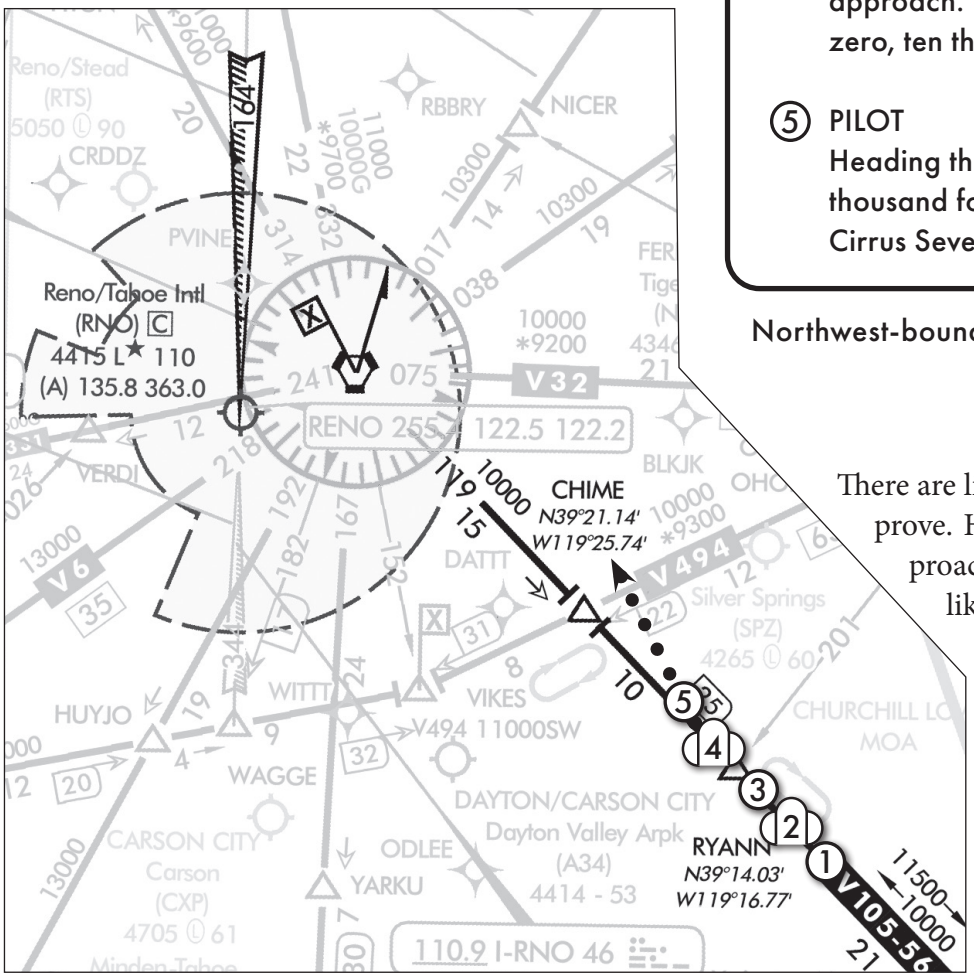
① PILOT
NorCal Approach, Cirrus Eight Eight Seven Two Bravo, level one two thousand with information Victor.

② APPROACH CONTROLLER
Cirrus Seven Two Bravo, NorCal Approach. Expect vectors to the ILS X-Ray Runway One Six Right. Descend and maintain ten thousand.

③ PILOT
NorCal Approach, Cirrus Seven Two Bravo. Request vectors for the RNAV X-Ray One Six Left approach.

④ APPROACH CONTROLLER
Cirrus Seven Two Bravo ... uh ... we can do that. Fly heading three two zero, vectors for the RNAV X-ray One Six Left approach. Descend and maintain one zero, ten thousand.

⑤ PILOT
Heading three two zero. Leaving twelve thousand for ten thousand. Thanks. Cirrus Seven Two Bravo.



Northwest-bound on V105 approaching RYANN
Southeast of Reno, NV
NorCal Approach 119.2

There are limits to what a controller will approve. Had you requested an RNAV approach to Runway 34L or 34R, it would likely be declined, as that would be against the flow of other traffic into Reno.

TIP

If visibility is low, request the approach with the best approach and runway lighting.

GET THE DESTINATION DATA EARLY SO YOU CAN MAKE APPROACH PLANS

When your destination airport has approach control services, has two or more published instrument approach procedures, and the visibility is below three miles and the ceiling is below the highest initial approach altitude for those approaches, your controller (or the ATIS) should let you know which approach to expect. That's the norm when IFR to a towered airport destination.

When you're flying IFR to a non-towered airport, the controller will ask if you have the current weather, or give you the nearest weather if there's no automated weather at your destination. If conditions aren't VFR, the controller will then query, "Say approach request."

Either way, it behooves you to get all your destination airport information as early as practical. This is where datalink weather, such as FIS-B, is extremely helpful. You can take a guess which runway(s) and approach(es) are likely in use before you can even tune the ATIS or ASOS.

● IFR	50m ago (ADS-B)
KSNC 271735Z AUTO 00000KT 1SM +RA SCT008 BKN021 OVC035 10/09 A2985 RMK AO2	

Remember, that these are METARs, and the winds are shown in degrees true, not degrees magnetic. Depending on where your destination is located, that could make a big difference. They're also only updated hourly.

You can ask ATC for weather at an airport well ahead of you, so long as they aren't too busy. If they are, there's always leaving the frequency to call Flight Service (page 70).

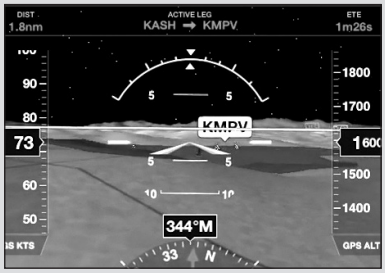
If the weather at your destination is low, you might want to ask your controller if any aircraft have had issues on the approach or gone missed approach. That might affect your approach planning and request.

NIGHT ARRIVAL? FLY AN APPROACH

If the weather at your destination meets certain criteria, you may simply get a vector for a visual approach (page 98). You're still IFR, but you'll be flying to the airport visually, and it's assumed by the most direct route. More importantly, you take responsibility for terrain and obstacle clearance.

That might be fine with you, or it might be an invitation to ruin your day. If it was night time, or even if the airport was unfamiliar to you, flying a published approach keeps you clear of terrain and sets you up for a straight-in landing. The published approach costs more time than the visual, but it enforces more structure, which can be safer.

When you're descending for the destination and the controller tells you to expect the visual, or gives you a vector for a visual approach, that's the time to request a published approach. This request can't be denied. You're IFR and entitled to fly a full approach whenever you request one (although there may be a delay).

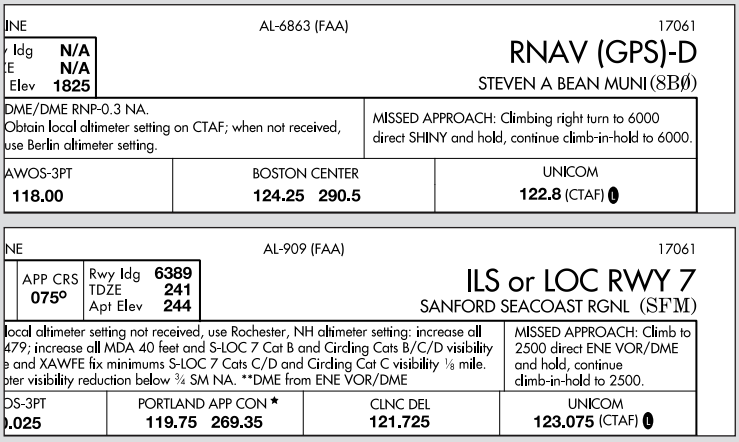


PLANNING THE DESCENT

Descent planning is a science of numbers—if you can start down whenever you please. It's a game of trust when ATC has control of your altitude. If you're part of a long line of aircraft arriving at a busy hub, it's usually not an issue. Every inbound flight follows the same path, and someone ahead of you would have already made a snide remark about the "slam dunk" approach. Approaches to smaller airports might not work out as well.

For this reason, start figuring out your descent while you're still enroute. If you're getting nervous about losing enough altitude for the approach, ask for a lower altitude. If need be, you can request a few turns in a hold at the beginning of the approach to lose altitude, as well.

THE STRUCTURE OF APPROACH CLEARANCES



Before getting into examples of approach clearances, it's worth breaking down their structure. The number of elements in the clearance increases as the approach clearance gets more specific, but they come in a predictable order.

"[Call sign] cleared approach," is the simplest form, although you'll rarely hear it. "Cirrus Seven Two Bravo, cleared approach," would give you permission to follow a published route (such as an airway) to any feeder, or IAF, for your destination airport. This is for low-traffic airports only.

"... cleared [approach type] approach" works when there's only one of a specific type of approach to the airport. If the only ILS at the airport is to Runway 07, then you could hear "Cirrus Seven Two Bravo, cleared ILS approach."

"... cleared [approach type]-[letter] approach" is for approaches with only circling minimums. These approaches serve no specific runway. Letters are from the start of the alphabet, such as "Cirrus Seven Two Bravo, cleared VOR Alpha approach."

"... cleared [approach type] [Runway] approach" is used when there are approaches of the same type to multiple runways. If there were RNAV approaches to Runways 30 and 12, then, "Cirrus Seven Two Bravo, cleared RNAV Runway 30 approach," specifies which one you're cleared to fly.

"... cleared [approach type] [Runway] [letter] approach" happens when there are multiple approaches of the same type to the same runway, such as two versions of an ILS with different requirements. These letters are from the end of the alphabet, such as "Cirrus Seven Two Bravo, cleared ILS Zulu Runway 22R approach."

"... cross [fix] at or above [altitude] ..." can come at the start of the clearance to prevent early descent. Approach clearances automatically grant descent pilot's discretion, if the pilot is on a published route (airway, feeder, or approach). So, "Cirrus Seven Two Bravo, cross HAVEN at or above 3000, cleared ILS approach," means pilot's discretion to 3000 feet until HAVEN, and pilot's discretion on descents for the remaining approach.

"... [distance] from [fix], fly heading [number], maintain [altitude] until established, ..." would be added if the aircraft was being vectored to the final approach course, and ATC combined the final heading with the approach clearance: "Cirrus Seven Two Bravo, four miles from SAPPI, fly heading 270, maintain 2000 until established, cleared RNAV Runway 29 approach." The distance is required any time the aircraft isn't established on a published route, including clearance to the IAF for a TAA (See "Terminal Arrival Areas Simplify Vectors and Communications" on page 109).

A controller may even toss in one more instruction, such as contacting tower or maintaining best forward speed until a specific fix.

Because approach clearances follow this standard format, and controllers issue them all day, they tend to say them at espresso speed. If you miss some items, read back the parts you understood, and then add, "Say again approach clearance."

A detail overlooked by many pilots is that "or" in an Approach Chart such as the "ILS or LOC Rwy 07" means there are actually two approaches co-charted. The approach clearance will be for one of those approaches. If you specifically want the localizer approach, you should ask for it by name. Your clearance would include "cleared localizer Runway 07 approach." You might hear this if the glideslope was out of service and only the localizer approach was available.

You could hear at any time, **"Cancel approach clearance."** This means exactly what it says, and should be followed immediately by instructions, such as a heading and/or altitude to fly (page 97).

Receive an Approach Clearance (with Vectors to Final)

(1) APPROACH CONTROLLER
Cirrus Eight Eight Seven Two Bravo, turn left heading one seven zero, vectors for the ILS Runway Three Five approach. Descend and maintain one thousand eight hundred. Verify you have Sugar Land information Mike.

(2) PILOT
Left to one seven zero, leaving four thousand for one thousand eight hundred. We have Mike. Cirrus Eight Eight Seven Two Bravo.

(3) APPROACH CONTROLLER
Cirrus Seven Two Bravo, turn right heading two six zero.

(4) PILOT
Right two six zero. Cirrus Seven Two Bravo.

(5) APPROACH CONTROLLER
Cirrus Eight Eight Seven Two Bravo, three miles from HULLO, turn right heading three two zero, maintain one thousand eight hundred until established on the localizer. Cleared ILS Runway Three Five approach.

(6) PILOT
Right three two zero, one thousand eight hundred until established. Cleared ILS Runway Three Five approach, Cirrus Eight Eight Seven Two Bravo.

(7) APPROACH CONTROLLER
Cirrus Eight Eight Seven Two Bravo, contact Sugarland Tower, one one eight point six five. Good day.

(8) PILOT
Contact Tower. Cirrus Eight Eight Seven Two Bravo.

Sugar Land Regional Airport (KSGR)
Sugar Land, TX
Houston Approach 123.8

Even though virtually all instrument approaches are designed so you can fly them without assistance from ATC, the assumption is you'll want ATC vectors onto the final approach course.

The first part of vectors to the final approach course (a.k.a. "vectors to final"), is similar to approaching a towered airport VFR. The tower controller might have you approach straight-in if you're aligned with the landing runway already. You might enter on a long base. Or you might fly a downwind, turn base, and then turn final. The same is true when vectored IFR, except the controller will have you turn "downwind" (1) or "base" (3) miles from the airport. This sets you up for the approach clearance.

The secret to mastering approach clearances is that they all follow a common format (see "The Structure of Approach Clearances" on page 89 for the complete picture). The format for vectors to final comes in two flavors.

The more common one for less busy airports is something controllers call "position, turn, altitude, and clearance," or "PTAC" (5). The format is:

> [Call sign] [**Position** relative to the FAF]. **Turn** (left/right) heading [Intercept to the final approach course], maintain [**Altitude**] until established [On the localizer or inbound-course], **Cleared** for the [Name of approach].

The controller may include instructions to contact Tower, or change to CTAF, along with the approach clearance, or give it later (7).

The approach clearance is long, so just read back the essential bits: heading, altitude, and approach name. Things happen fast (especially if you have a tailwind), so it's usually best to start your final turn as you read back your clearance (6). That said, verify that the position the controller states makes sense, and compare the assigned altitude with what you must descend to on the approach. The altitude restriction is only until you're established, after which descent

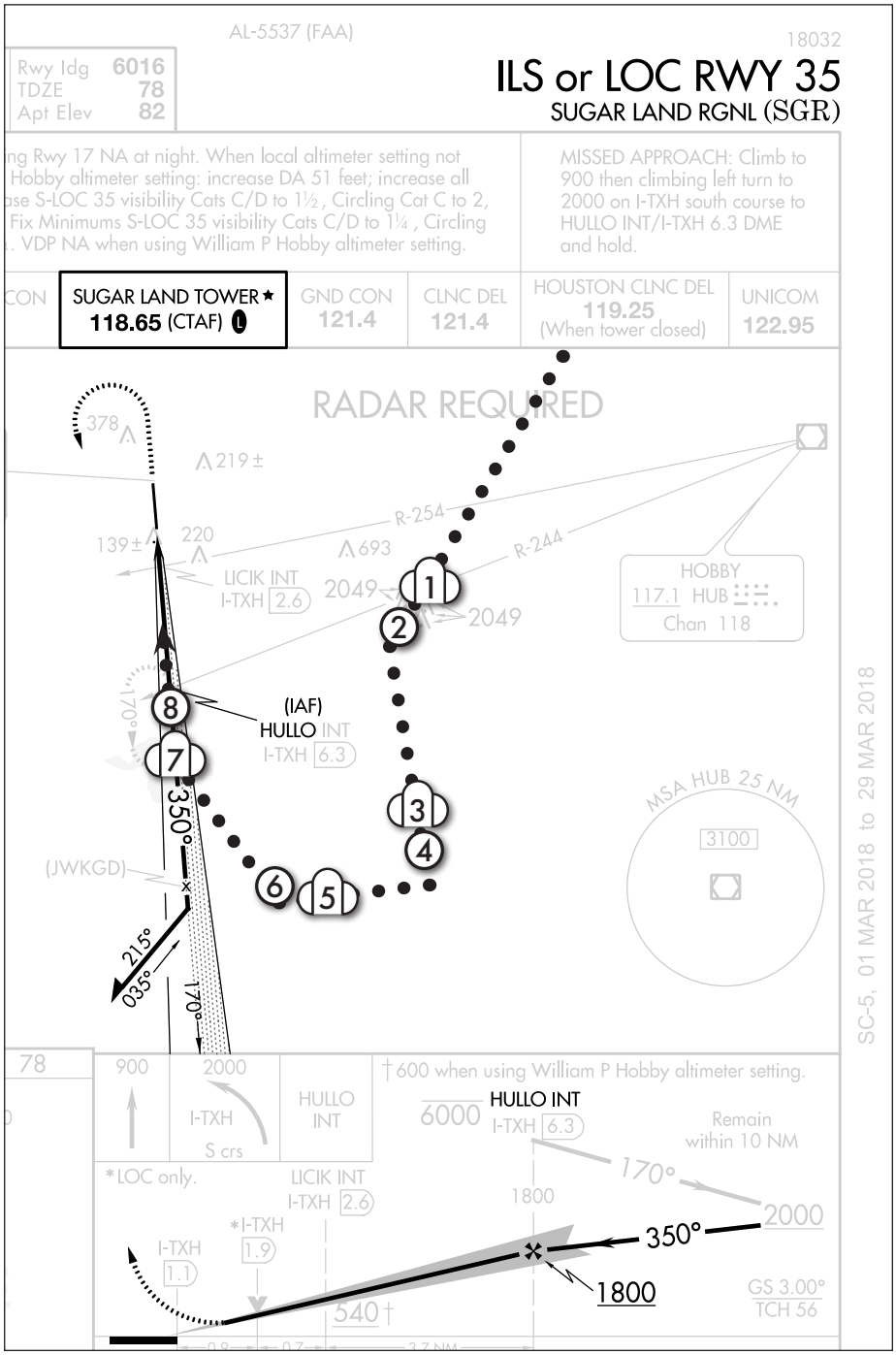
CONTROLLERS VECTOR YOU TOWARDS AN UNMARKED APPROACH GATE

Pilots think in terms of a Final Approach Fix (FAF), but the controller uses a point at least one mile further from the airport (and at least five miles from the runway threshold). This is called the "approach gate," and doesn't appear on any pilot charts.

In poor weather, ATC must vector you to intercept no closer than two miles before the approach gate (at least three miles from the FAF). The intercept angle is usually 30 degrees.

In better weather, the controller can vector you to intercept closer, but no closer than the approach gate, and the maximum angle (when that close) can only be 20 degrees.

If you specifically request it, you can get vectored to intercept inside the approach gate, but no closer than the FAF. It's best to ask for this in plain English, but sometimes you'll hear it requested as, "a tight turn onto the localizer."



is at pilot's discretion. If you want to change frequencies earlier than the controller prompts you, simply request it.

The alternate to a PTAC splits the process into two parts. The first is a vector to intercept and join the localizer as in, "Cirrus Seven Two Bravo, fly heading three two zero and intercept the localizer." The second would come after you were established on the localizer: "Cirrus Seven Two Bravo, three miles from HULLO, cleared ILS Runway 35 approach." The controller might issue an altitude to maintain until crossing a fix. If not, once you're established, altitude is at pilot's discretion.

This format is typical at busy airports where you're one in a "string of pearls" ATC has lined up on a looong final.

TIP

In the U.S., "established" on an approach isn't formally defined, but it's commonly considered as CDI deflection of less than full scale. Under some international rules, it's defined as less than 3/4- or 1/2-scale deflection.

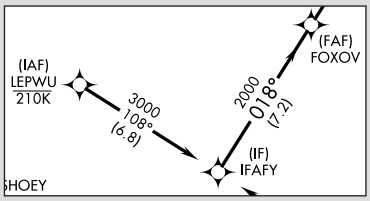
VECTORS ACROSS THE LOCALIZER

If you were on a vector to the final approach course, and you crossed right through it without a word from ATC, what would you do? You might hold your heading thinking there was a good reason, or you might turn thinking you were forgotten or lost communication.

That's why a controller must inform you whenever a vector will take you across the final approach course, along with the reason, such as: "Expect vectors across final for spacing." (Fun factoid: ATC uses the word "across" rather than "through" because "vectors through the localizer" could sound like "vectors to the localizer," which is exactly the opposite intent.)

If it looks like you'll be crossing the approach course and you haven't been warned—speak up. There are airports where continuing on the last assigned heading could take you into mountains, radio towers, or through the final approach course of another airport. If you can't get a word in on a busy frequency, just push IDENT on your transponder. That'll get the controller's attention.

APPROACH ABBREVIATIONS TO KNOW



You won't hear a controller use these terms, but their roles impact your clearances.

Initial Approach Fix (IAF). If you navigate an approach without any ATC assistance, you start at an IAF, which is the first fix in the approach sequence.

Intermediate Fix (IF). An approach could have one or multiple intermediate fixes between the IAF and the FAF. ATC can vector you to an IF, or onto a segment of the approach connecting an IF or FAF.

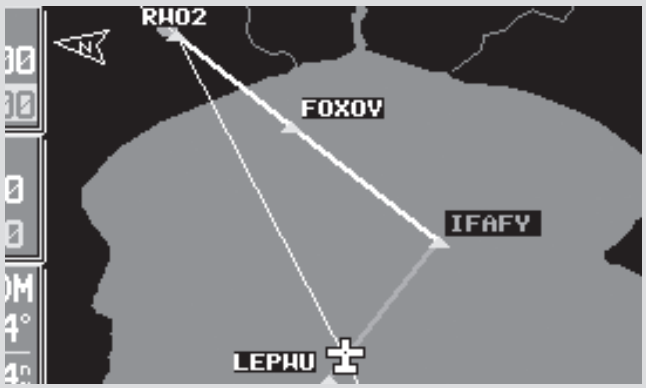
Final Approach Fix (FAF). This is the last fix you must be able to identify before descending to a published MDA or DA for the approach. ATC can't vector you onto the approach less than three miles from the FAF unless you request it (see "Controllers Vector You Towards an Unmarked Approach Gate" on page 91.) Usually, the letters "FAF" only appear on RNAV Approach Charts.

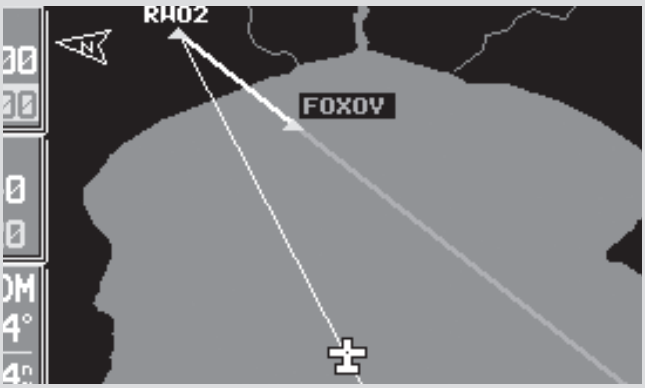
KEEP THOSE WAYPOINTS AVAILABLE ON YOUR GPS

If you're receiving vectors prior to the IAF or IF, don't assume you'll be vectored all the way to the final approach course unless the controller says, "vectors to final approach course." You may be vectored for a bit, and then cleared direct to a fix on the approach. You may be asked to maintain an altitude until crossing a fix, which you need the GPS flight plan to identify.

If you activate the "Vectors to Final" feature of your GPS, you may lose all of the fixes outside the FAF—which you now need. This can happen with RNAV approaches, as well as when using GPS to augment ILS approaches.

Newer GPS navigators may keep the fixes visible, but still remove legs from the flight plan you are now expected to fly.





① PILOT
Point Mugu Approach, Cirrus Eight Eight Seven Two Bravo. Six thousand. Information Oscar.

② APPROACH CONTROLLER
Cirrus Eight Eight Seven Two Bravo, Point Mugu Approach. Mugu Altimeter two niner niner eight. You want the RNAV Zulu Runway Two Six approach?

③ PILOT
Two niner niner eight, and affirmative, Cirrus Eight Eight Seven Two Bravo.

④ APPROACH CONTROLLER
Cirrus Seven Two Bravo, roger. Eight miles from JUREX, cross JUREX at or above four thousand. Cleared Camarillo RNAV Zulu Runway Two Six approach.

⑤ PILOT
Cross JUREX at or above four thousand, cleared RNAV Zulu Runway Two Six approach, Cirrus Seven Two Bravo.

⑥ APPROACH CONTROLLER
Cirrus Seven Two Bravo, contact Tower one two eight point two.

⑦ PILOT
Tower on one two eight point two, Cirrus Seven Two Bravo.

Before radar was the norm, pilots did all the navigation themselves. Radar improved efficiency as ATC pointed aircraft directly to a point in space to intercept a course. Widespread use of GPS is shifting responsibly back to pilots. Controllers refer to this as "point and shoot": Send an aircraft direct to fix, and the pilot does the rest. There are limitations, such as a maximum turn when crossing the fix (usually 90 degrees for RNAV and 120 degrees for ground-based final approach courses).

Your approach clearance will have an altitude restriction while you're on a vector to the fix ④. The approach clearance inherently grants descent at your discretion past that fix (JUREX here), so long as you comply with published restrictions on the approach.

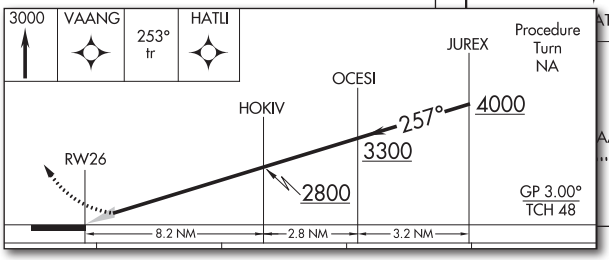
Had you been on a published route, such as an airway that connected to a feeder route or an IAF (like SUANA), you probably wouldn't receive an altitude restriction. In this case, descent is at pilot's discretion once the clearance is issued, but there's no climbing without permission.

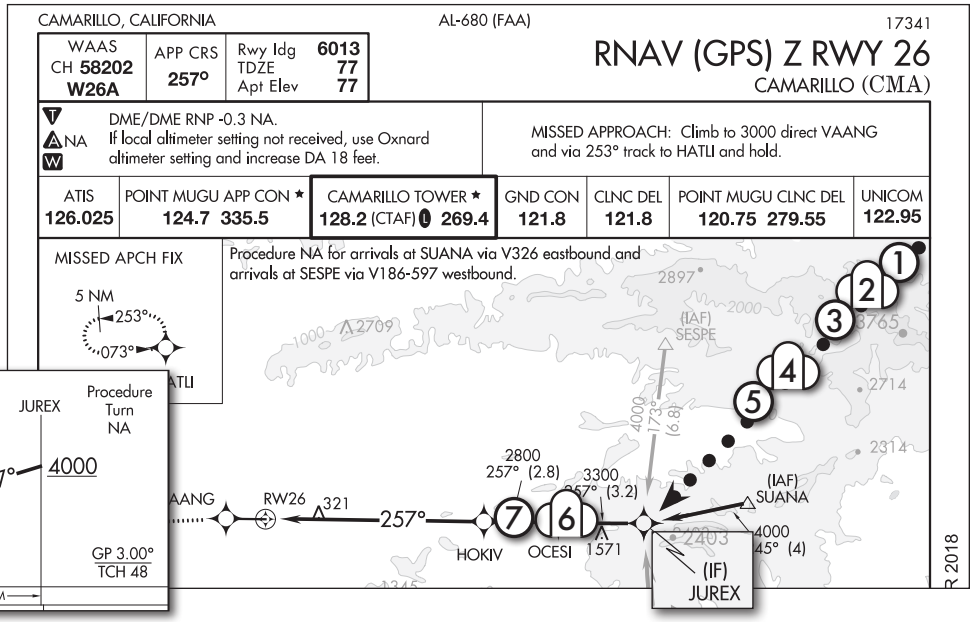
When you're flying to a fix to start an approach, it's a lot quieter, but your progress across the scope is still being watched. If you have questions, ask.

TIP

Don't say words in parentheses of the title. This is the "RNAV Zulu Runway Two Six Approach."

Camarillo Airport (KCMA)
Camarillo, CA
Point Mugu Approach 124.7





Receive an Approach Clearance (via a Fix with Report)

① CENTER CONTROLLER
Cirrus Eight Eight Seven Two Bravo, you're one six miles from AKAKE, cross AKAKE at or above three thousand. Cleared RNAV Runway Two Zero approach. Radar service terminated. Report procedure turn inbound.

② PILOT
Cross AKAKE at or above three thousand. Cleared RNAV Runway Two Zero approach. Report procedure turn inbound. Cirrus Eight Eight Seven Two Bravo.

③ PILOT
Minneapolis Center, Cirrus Eight Eight Seven Two Bravo is procedure turn inbound.

④ CENTER CONTROLLER
Cirrus Seven Two Bravo, roger. Report MERVE.

⑤ PILOT
Report MERVE. Cirrus Seven Two Bravo.

⑥ PILOT
Center, Cirrus Seven Two Bravo, MERVE.

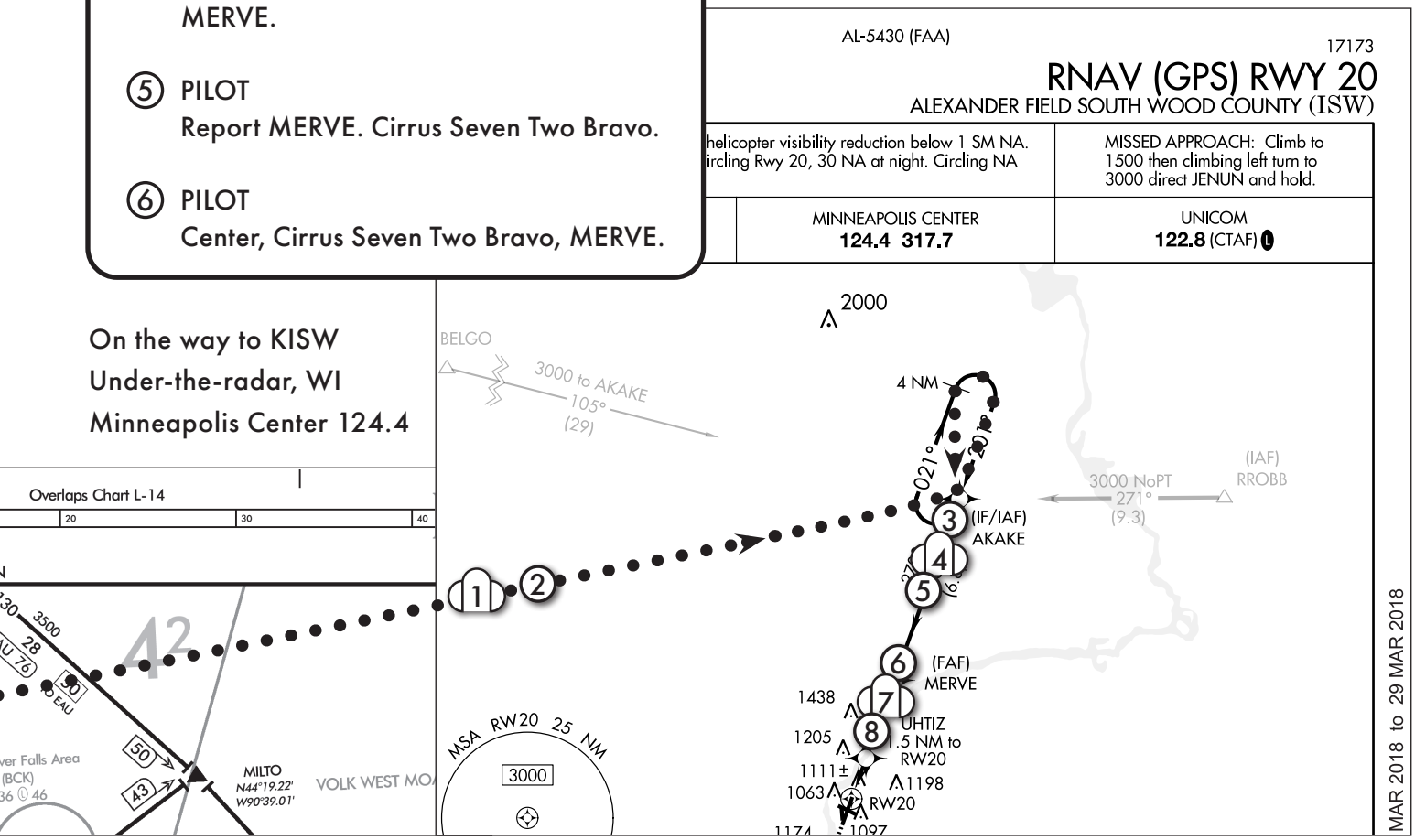
⑦ CENTER CONTROLLER
Cirrus Seven Two Bravo. Cancel IFR this frequency or with Flight Service on the ground. Change to advisory frequency approved.

⑧ PILOT
Over to advisory. We'll let you know if we break out early. Cirrus Seven Two Bravo.

Vectors to the final approach course (page 90) are only available in areas with radar coverage. An approach clearance via a fix (page 93) could be within radar coverage or not.

Approaches below radar coverage are always from a fix, and include position reports so the controller can monitor your progress. Certain reports are mandatory, such as crossing the FAF ⑥. Other reports are only if requested ①. A controller might

On the way to KISW
Under-the-radar, WI
Minneapolis Center 124.4



ask for a report even if you are in radar coverage. For example, you might be flying a few turns in a hold before proceeding inbound. Unlike enroute position reports that include altitude and time (page 74), reports on an approach are normally just the position you're required to report, or were asked to report.

The term "inbound" leaves some ambiguity. The Pilot/Controller Glossary defines it as: "That point of a procedure turn maneuver where course reversal has been completed and an aircraft is established inbound on the intermediate approach segment or final approach course." If the procedure turn is at an IAF/IF, then the procedure turn inbound would have to be after crossing the IF back inbound because that's the beginning of the intermediate segment. If the procedure turn is part of an intermediate segment, or ended with the aircraft established on the final approach segment (such as the VOR/DME approach on page 96), then you could be established inbound as soon as you began to re-intercept the inbound course.

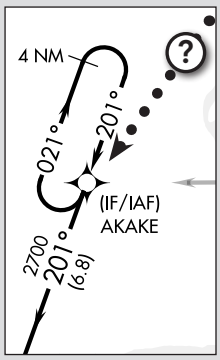
In the real world, it matters more that you remember a report, than where you actually key the mic.

PROCEDURE TURN REQUIRED?

You're approaching an IAF/IF with a hold-in-lieu-of-procedure-turn (HILPT) and you could easily continue straight-in, but you're not on NoPT route or sector. Must you fly the hold?

This long-standing debate has a correct answer from a communications perspective. If ATC wants you to fly straight-in, the clearance should be: "Cirrus Seven Two Bravo, cleared straight-in, RNAV Runway 20 approach." That's permission to skip the racetrack pattern.

If you don't hear and want it, request a clearance to fly "straight-in." Some pilots just read back the clearance adding the words "straight-in" themselves, figuring it's what ATC expects anyway, and now the acceptance of that is on tape.



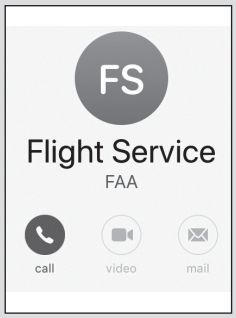
CANCELING YOUR IFR FLIGHT PLAN WITHOUT A TOWER

With an instrument approach to a towered airport, you're cleared for the approach and eventually told to contact Tower. Tower observes your landing and your IFR flight plan cancels automatically. (Canceling is what ATC calls it when your IFR flight plan comes to a close, even after landing.)

For a non-towered airport, you'll receive IFR cancellation instructions before the permission to change frequencies ⑦. From that point on, you could be out of communication with ATC (page 105). Radar service is automatically terminated when you change to the advisory frequency.

However, the controller is still protecting the airspace waiting for your IFR cancellation, or for you to reappear on missed approach. If you don't do one of those within 30 minutes, they'll start calling your contact numbers and the airport manager or FBO to see if you landed, or they need to start looking for wreckage.

That's one reason it's best to cancel IFR before switching to CTAF if you can land VFR. No other aircraft can depart IFR or start an approach until you cancel. That restriction might extend to nearby airports locked down in case you go missed approach.



The trap is that once you cancel, you're VFR, and must maintain VFR cloud clearances and visibility. Pilots ignoring this have received enforcement actions from the FAA.

Your options for canceling from the ground are the same as getting it in the first place: Try contacting ATC directly via the radio, call ATC by a phone number listed in the Chart Supplement, or call FSS by radio or phone. Some websites and apps can also cancel (close) IFR flight plans.

Request a Full Procedure Approach

① PILOT
Bangor Approach, Cirrus Eight Eight Seven Two Bravo, level seven thousand with one-minute weather for Old Town.

② APPROACH CONTROLLER
Cirrus Eight Eight Seven Two Bravo, Bangor Approach. Say approach request at Old Town.

③ PILOT
Request full procedure VOR DME Two Two approach from CAVIL. Cirrus Eight Eight Seven Two Bravo.

④ APPROACH CONTROLLER
Cirrus Eight Eight Seven Two Bravo, roger. Turn right heading three three zero. When able, proceed direct CAVIL.

⑤ PILOT
We're direct CAVIL now. Cirrus Eight Eight Seven Two Bravo.

⑥ APPROACH CONTROLLER
Cirrus Eight Eight Seven Two Bravo, cross CAVIL at or above five thousand. Cleared VOR/DME Runway Two Two approach. Cancel IFR this frequency, or with Flight Service on the ground. Change to advisory approved.

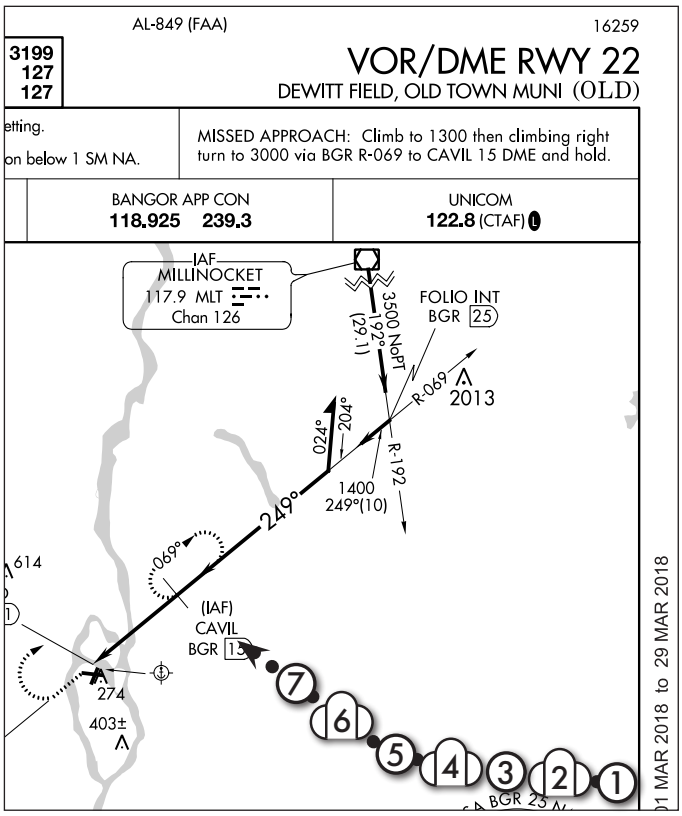
⑦ PILOT
Five thousand to CAVIL. Cleared VOR/DME Runway Two Two approach. Cancel this frequency or on the ground. Change to advisory approved. Cirrus Eight Eight Seven Two Bravo.

Dewitt Field, Old Town Municipal Airport (KOLD)
Old Town, ME
Bangor Approach 118.92

Controllers aren't mind readers (although they often issue instructions at the most inconvenient moments). When you check in enroute to a non-towered airport with multiple approach options, the controller will likely ask which one you want ②.

Your response should include exactly what you need. If you wanted vectors onto the final approach course, you'd say, "Request vectors for the VOR/DME Runway Two Two approach." If you were coming from the north and wanted to fly the approach from the IAF of Millinocket (MLT), you'd say, "Request direct Millinocket for the VOR/DME Runway Two Two approach." Here you want to fly the approach from CAVIL but without the assistance of ATC. This means you will have to make a procedure turn to reverse course, so you request the "full procedure." Because this is more challenging than vectors, controllers know you're probably requesting it for practice.

Technically, any approach from an IAF is a "full approach procedure," but it's less confusing to request a "full procedure" when you want to fly a course reversal (whether that's a procedure turn, racetrack pattern, or teardrop). If you want to fly the full approach from an IAF but without a course reversal, ask for the "straight-in [approach name] from [name of IAF]"



THINGS ATC MIGHT SAY WHILE YOU'RE FLYING AN APPROACH

During the approach phase of IFR flight, you're probably one of several balls the controller is juggling. There are many phrases you might hear, even after getting cleared for the approach.

"Report procedure turn in-bound," applies to any course reversal, including racetrack patterns on most RNAV approaches. Pilots argue about what constitutes "in-bound," but it's no later than established on the course toward the airport.

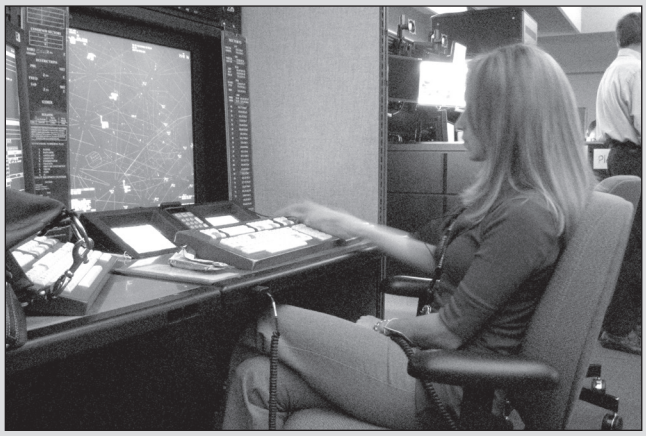
"Join the localizer," means that when your assigned heading crosses the localizer, you should turn and follow the localizer toward the airport. For some reason, ATC can't issue your approach clearance yet, but it will come soon.

"Report established," goes well with "join the localizer." You can report established as soon as you start following the inbound approach guidance, even if you're still getting stabilized on it.

"Maintain [speed]," might come if you're following a slower aircraft or ahead of a faster one. The key points are that an approach clearance cancels a speed restriction, unless the controller restates the restriction, and that speed restrictions no longer apply after you cross the FAF or are within five miles of the landing runway, whichever is closer.

"Aircraft ahead reported [condition]," could be anything: wind shear, turbulence, ceiling where they broke out, or an equipment problem like the glideslope acting erratic. You can ask the controller to query aircraft ahead of you about conditions, if they're still in communication.

"I'm showing you [right/left] of course," or the more subtle, **"[Call sign], verify you're established on the final approach course?"** is not what you want to hear while in the clouds. Hopefully,



this isn't news, and you can respond with, "We're already correcting," as you make the walk of shame back onto the localizer.

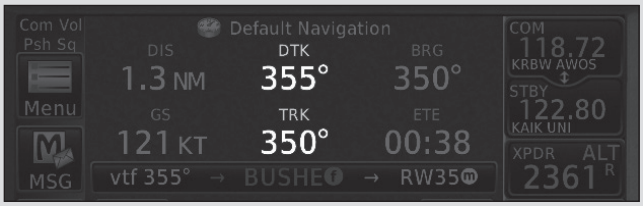
"Low altitude alert. [Call sign] check your altitude immediately," is something you never want to hear—especially if it's your call sign. In fact, the prudent move may be to at least level off, if not execute a missed approach right then.

"Traffic alert, [Call sign] [instruction]," could be heard any time, but is more likely around airports with many VFR targets. It will likely contain the word "immediately" as in, "Traffic alert, Cirrus Seven Two Bravo, turn left immediately heading 220 climb and maintain 3000."

"Cancel approach clearance. Climb and maintain [altitude], fly heading [heading]," rescinds your right to fly the approach. Comply with the instructions as you read back the cancellation.

If radar contact is lost while descending to your destination, you may simply hear, "radar services terminated," and get a clearance for the approach, rather than the "radar contact lost" you would hear enroute. Loss of your target on radar while descending to land is no big surprise, so everyone just gets on with the business of IFR.

USE THAT GPS AND AVOID THE WALK OF SHAME



If you have a GPS in the aircraft, do yourself a favor: Use lateral distance to the final approach course to anticipate the turn onto final, and use track information to stay centered on course. It's less communication (and chagrin) for everyone.

Receive a Clearance for a Visual Approach

1 APPROACH CONTROLLER
Cirrus Eight Eight Seven Two Bravo, turn right heading two seven zero, vectors for the visual approach to Clearview Airpark.

2 PILOT
Right two seven zero. Cirrus Eight Eight Seven Two Bravo.

3 APPROACH CONTROLLER
Cirrus Eight Eight Seven Two Bravo, Clearview is at twelve o'clock, one five miles. Report the airport in sight.

4 PILOT
We have the airport in sight. Cirrus Eight Eight Seven Two Bravo.

5 APPROACH CONTROLLER
Cirrus Eight Eight Seven Two Bravo, cleared visual approach to Clearview Airpark. Weather information not available. Report cancellation of IFR on this frequency or on the ground. Change to advisory approved.

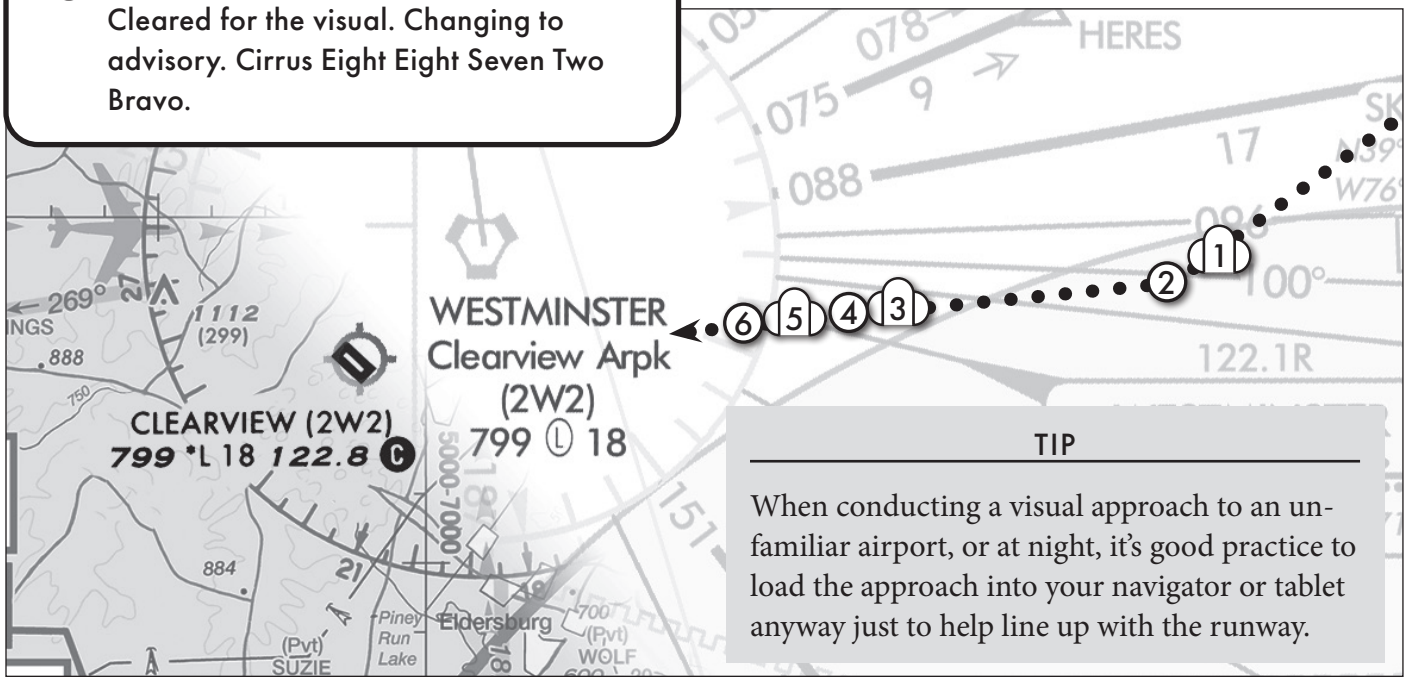
6 PILOT
Cleared for the visual. Changing to advisory. Cirrus Eight Eight Seven Two Bravo.

Because travel under IFR often happens on crystal clear days, many IFR flights end with a visual approach. The "visual" is authorization to proceed to the airport visually, with the exact route and altitude at your discretion. Therefore, a visual approach is not an instrument approach—and there's no missed approach segment. However, you're still on an active IFR flight plan.

To be cleared for a visual approach, the reported weather must meet VFR minimums: ceiling at least 1000 feet AGL and visibility three miles or greater. You must report having either the airport or the preceding inbound aircraft in sight. You may request the visual when these conditions exist. An alternative is requesting a Contact Approach (page 100).

ATC may also clear you for a visual approach even if you didn't request it, once you report the airport in sight. You can even start with a clearance for a published approach, get the airport in sight, and request a clearance for a visual approach instead. Once granted, the clearance for a visual approach frees you from lateral and vertical guidance restrictions (stepdowns) from the published approach—but now you're responsible for obstacle avoidance.

Clearview Airpark Airport (2W2)
Westminster, MD
Potomac Approach 125.52



TIP

When conducting a visual approach to an unfamiliar airport, or at night, it's good practice to load the approach into your navigator or tablet anyway just to help line up with the runway.

NO PUBLISHED APPROACH = NO MISSED APPROACH PROCEDURE

Whenever you request or accept a visual approach, you accept an ambiguity: There's no missed approach segment so if you can't land ... now what?

The simple solution is entering a traffic pattern to return for a normal landing. At a towered airport, that's presumably what Tower will tell you to do. At a non-towered airport, you'd simply announce the move yourself. In the latter case, you'd best have a plan beforehand which way you'll turn to enter that pattern. It's easy to plan for an IFR arrival and skip basic VFR items about the airport such as traffic patterns.

The issue is more complicated if you can't land at that airport, say for a disabled aircraft on the runway. In this case, you have a choice to initiate a true missed approach or proceed visually to another airport.

If you decide to go missed approach at a towered airport, tell Tower your intentions as you clean up and climb. The controller should send you back to Departure, usually with an altitude and heading to fly. You're still IFR, which technically gives you permission to go back into the clouds, but you'll want to get on radar with instructions ASAP. At a non-towered airport, climb and get back in touch with ATC right away.

If you choose to proceed visually, remember that you're still IFR and ATC is waiting for your cancellation. A tower can do this for you, but at non-towered airports, you must contact ATC and cancel IFR yourself.

A complete briefing includes the missed approach—which changes the moment you accept a visual approach.

ATC can vector you for a visual approach ①, however, the weather must be even better. The reported ceiling must be at least 500 feet above the MVA/MIA, with at least three miles visibility. If the destination airport has no weather reporting service, the controller must be reasonably sure that you can descend and fly to the airport visually, and must inform you that weather information is not available.

To help you spot the airport, the controller will give you its bearing and distance from you ③. If there are other airports in close proximity, the controller will point them out to avoid confusion.

At a towered airport, the clearance will include the runway number:

> [Call sign], cleared visual approach Runway [Runway number]. [Restrictions (if applicable)].

When told to contact Tower (page 103), you would do so as when flying a published instrument approach, except that you would state you were "On the visual Runway [number]." Tower would observe your landing and cancel your IFR flight plan.

At a non-towered airport, like 2W2, the runway choice is yours:

> [Call sign], cleared visual approach to [Airport name], [Required remarks (if applicable)], [IFR cancellation instructions].

Considering the visual approach means you're in visual conditions, you might want to cancel IFR before you land (page 85), or you might not (see "Canceling Your IFR Flight Plan Without a Tower" on page 95).

Visual approaches are the only approaches allowed where there's no published instrument approach. The advantage of flying a visual approach, rather than canceling IFR right away, is that you still have an IFR clearance in the event you can't land (see above). When flying a visual to an airport you don't know well, it helps to load an approach for the landing runway, or put a direct-to course on a runway heading into your GPS to help you find the field.

TIP

Visual approaches require you have at least three miles visibility in flight. However, cloud clearance requirements (FAR 91.155) do not apply. You must simply stay clear of clouds. That said, there may be VFR aircraft in the area. In Class G airspace, they may fly barely clear of clouds, too.

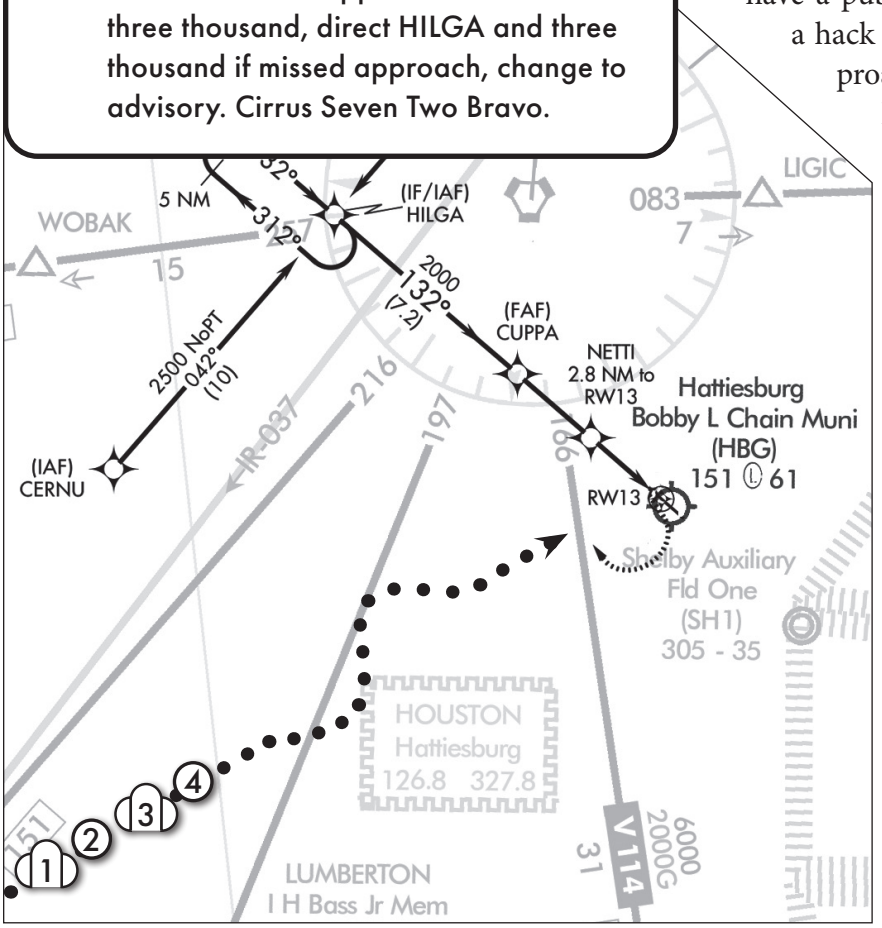
Request a Contact Approach

(1) CENTER CONTROLLER
Cirrus Seven Two Bravo, proceed direct CERNU, descend and maintain three thousand. Verify you have the Hattiesburg weather?

(2) PILOT
We have the Hattiesburg weather and request contact approach to Hattiesburg, Cirrus Seven Two Bravo.

(3) CENTER CONTROLLER
Cirrus Seven Two Bravo, cleared contact approach to Hattiesburg Bobby Chain airport at or below three thousand. If unable contact approach, proceed direct HILGA, maintain three thousand, report IFR cancellation this frequency or on the ground. Change to advisory approved.

(4) PILOT
Cleared contact approach at or below three thousand, direct HILGA and three thousand if missed approach, change to advisory. Cirrus Seven Two Bravo.



Hattiesburg Bobby L. Chain Municipal (KHBG)
Hattiesburg, MS
Houston Center 126.8

The contact approach is one of the most versatile, and most underused, tools for the IFR pilot. Once granted, it gives you the freedom to find your own route to the airport maintaining at least one mile visibility and staying clear of clouds. You don't need the airport, or a preceding aircraft, in sight. You simply need reasonable confidence that you can find your way to the airport visually without hitting anything. That's much more lenient than a visual.

If weather conditions are too poor for a visual approach, ATC must plan for a published instrument approach. If you want a contact approach instead, you must request it (2). ATC can't assign them. This can be a huge help when the airport doesn't have any approaches from your current direction of flight. It's also handy if you're being vectored for an approach, and you suddenly see the airport off your wing.

There are some limitations. The airport must have a published instrument approach, so it's not a hack to land at a remote airstrip with no approaches. The reported visibility must be at least one statue mile.

Because you fly your own route to the airport, contact approaches are more often used at non-towered airports where there isn't a steady stream of traffic. That said, you can request one to a towered airport, but the request should include the runway you want for landing.

There's no missed approach procedure, so you should be confident you can find the airport and land. If you can't land, your next move is like a visual approach (page 98), except with worse visibility.

TIP

While a contact approach at night is technically legal, just don't.

(1) APPROACH CONTROLLER
Cirrus Eight Eight Seven Two Bravo, SoCal Approach. Descend and maintain six thousand. Expect the Four Stacks Visual Runway One Five. Burbank altimeter two niner niner six.

(2) PILOT
Cirrus Eight Eight Seven Two Bravo. Leaving seven thousand for six thousand. We have Mt. Oat in sight.

(3) APPROACH CONTROLLER
Cirrus Seven Two Bravo, roger. Cleared for Four Stacks Visual Runway One Five approach.

(4) PILOT
Cleared Four Stacks Visual Runway One Five. Cirrus Seven Two Bravo.

(5) APPROACH CONTROLLER
Cirrus Seven Two Bravo, contact Burbank Tower one one eight point seven.

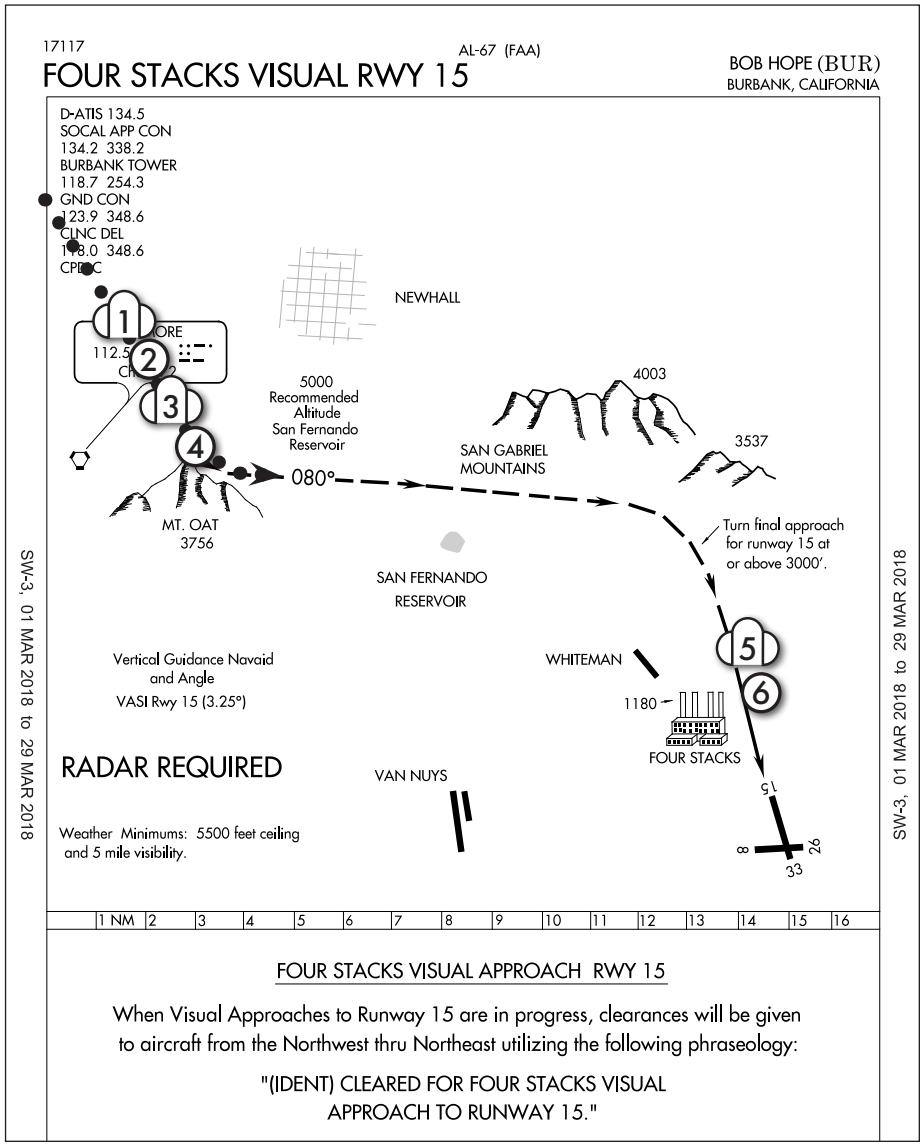
(6) PILOT
Contact Tower. Cirrus Seven Two Bravo.

Charted Visual Flight Procedures (CVFPs) are a hybrid: There's a lateral path you're expected to fly with landmarks, instead of approach fixes. There may be some altitude restrictions, but otherwise altitude is your discretion and obstacle avoidance is your responsibility. CVFPs serve specific runways. There may be published weather minimums (5500 feet and 5 miles in this case), so ATC won't issue the CVFP unless the weather is at or above those minimums. CVFPs also require an operating control tower.

CVFPs are primarily for turbojet aircraft at major airports, but some, such as the Four Stacks Visual, get assigned to light aircraft. You don't need another aircraft, or the airport in sight, to accept a CVFP. You just need to report seeing one of the charted landmarks.

When you're handed off to Tower (6), report in that you're "... on the Four Stacks Visual Runway One Five." As with any visual approach, there's no missed approach segment, however some CVFPs include special go-around instructions.

Bob Hope Airport (KBUR)
Burbank, CA
Socal Approach 134.2



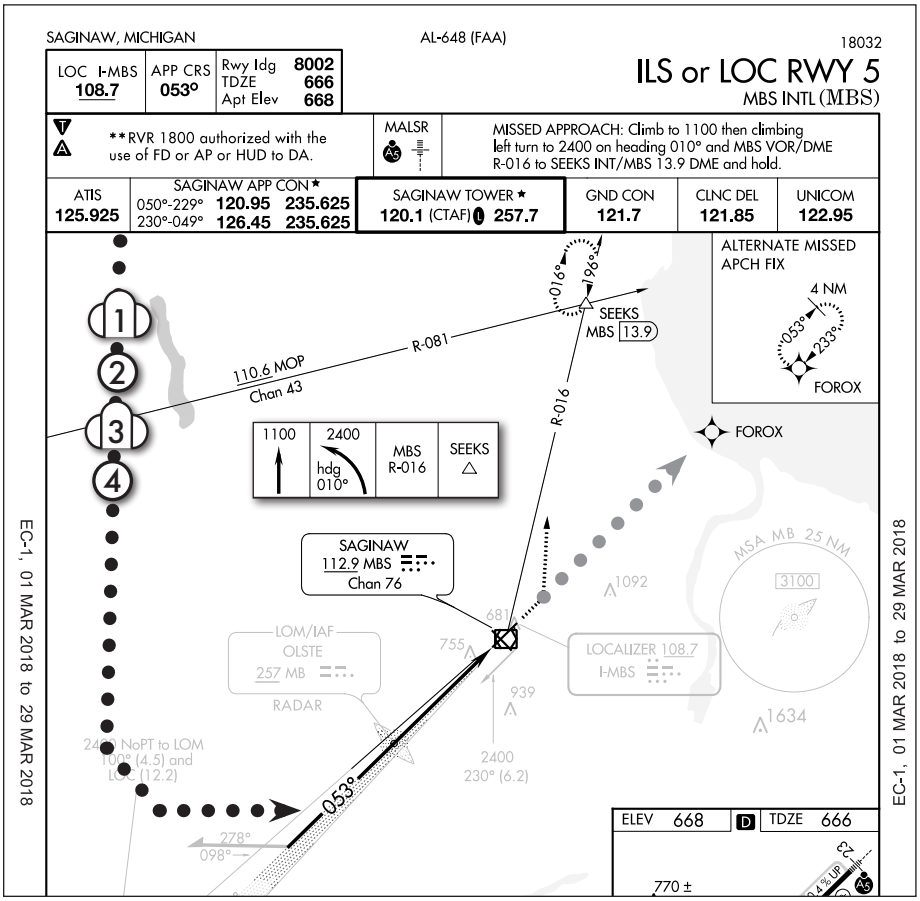
Receive Alternate Missed Approach Instructions

(1) APPROACH CONTROLLER
Cirrus Seven Two Bravo, I have alternate missed approach instructions for you. Advise ready to copy.

(2) PILOT
Ready to copy, Cirrus Seven Two Bravo.

(3) APPROACH CONTROLLER
Cirrus Seven Two Bravo, in the event of a missed approach, fly runway heading, climb and maintain three thousand, leaving one thousand one hundred proceed direct FOROX.

(4) PILOT
Missed approach procedure is fly runway heading, climb and maintain three thousand, leaving one thousand one hundred, direct FOROX. Cirrus Seven Two Bravo.



There are two reasons why ATC might issue alternate missed approach instructions. One is if the published missed approach procedure can't be flown due to a navaid outage or other issue. The other is that ATC has a plan for your missed approach that's significantly different than what's on the chart.

Receiving alternate missed instructions is as simple as hearing them (3) and reading them back (4). When a missed approach procedure requires a navaid not required for the approach itself, an alternate procedure is established with a new missed approach holding point (MAHP). That fix is often shown on the approach chart, however the procedure for reaching it is not. ATC must issue a route and altitude with the alternate missed approach instructions. The holding instructions at the MAHP may be omitted if that information is published on the approach chart.

If no alternate MAHP was charted, ATC would include all the information. This could happen if a temporary flight restriction required a change to a procedure not already in a NOTAM, traffic demanded it, or the alternate was simply SOP for the airport.

If you know a missed approach is likely (or even certain as happens with training), you can ask for alternate missed approach instructions. That way you can start going in the right direction immediately on the missed approach. Another reason to ask could be if equipment issues prevent you from flying the published procedure.

MBS International (KMBS)
Saginaw, MI
Saginaw Approach 126.45

TIP

If you want a circle-to-land at a towered airport, tell Approach or Center before the approach. They'll pass the message to Tower, who will plan accordingly.

No matter how you get onto an approach for a towered airport—vectors to the final approach course, from a fix, with or without a procedure turn, or even with a visual or contact approach—eventually you'll be handed off to Tower ①. This usually happens somewhere close to the FAF.

The format is the same in all cases:

[Facility name] Tower, [Full call sign],
[Name of approach with Runway number].

On a published approach, you use the name of the approach ③. If you were on a visual approach, call ③ would end with "... Seven Two Bravo, visual Runway One Seven." If your plan is to circle, you should have let Approach know in advance, so Tower should be expecting it. Verify that with a check in like: "Olympia Tower, Cirrus Eight Eight Seven Two Bravo, ILS Runway Runway One Seven, circle-to-land Runway Three Five."

Tower's simplest response is that you're cleared to land ④. However, there are many other options. In poor conditions, Tower might advise you of conditions other aircraft experienced on approach, or ask you to report the ceiling where you break out. In good conditions, they may call out VFR pattern traffic. (See "Things Tower Might Say or You Might Ask, IFR Edition" on page 104 for a more complete list.)

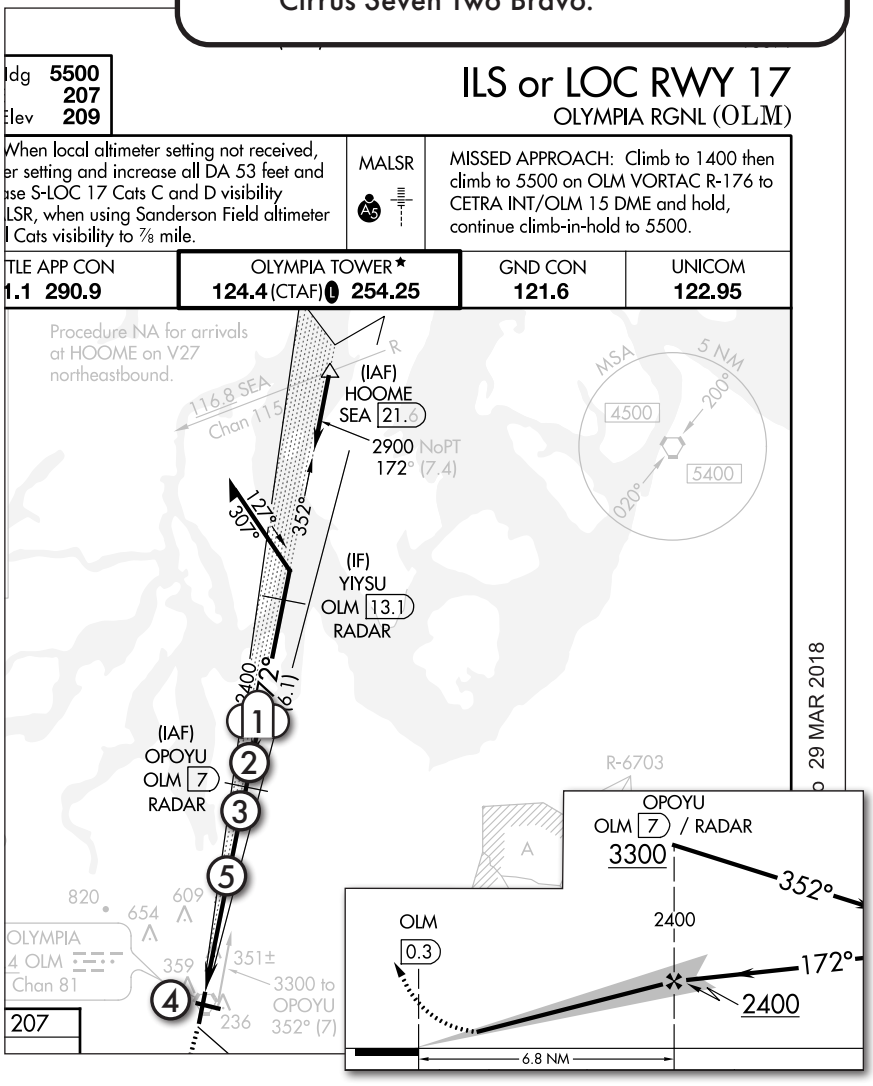
① APPROACH CONTROLLER
Cirrus Seven Two Bravo, contact Olympia Tower, one two four point four.

② PILOT
Contact Tower one two four point four. Cirrus Seven Two Bravo.

③ PILOT (on 124.4)
Olympia Tower, Cirrus Eight Eight Seven Two Bravo, ILS Runway One Seven.

④ TOWER CONTROLLER
Cirrus Eight Eight Seven Two Bravo, Runway One Seven, cleared to land.

⑤ PILOT
Runway One Seven, cleared to land. Cirrus Seven Two Bravo.



Olympia Regional (KOLM)
Olympia, WA
Seattle Approach 121.1
Olympia Tower 124.4

TIP

If your plan is a low approach instead of a landing, tell Approach or Center *long* before you switch to Tower so everyone is ready for your missed. Remind Tower when you check in on the approach.

THINGS TOWER MIGHT SAY OR YOU MIGHT ASK, IFR EDITION

It's been a long flight through solid clouds and now you're on final approach, ready to call it a day. You still have to fly the aircraft down to the pavement. When you check in with Tower, the controller will likely give you a landing clearance, and may offer some helpful information or ask the same of you. Here are a couple of common phrases:

"RVR [number]" is the Runway Visual Range. It's a measure of how far you can expect to see down the runway. If the RVR is anything close to the approach minimums, expect a missed approach.

"Wind [direction] [strength]" is more common on stormy days when visibility isn't so much the issue, but changing or gusty winds on the approach might be. (Unless you're landing at St. John's, Newfoundland, in which case it's always RVR 800, and 30 gusting 40.) If the surface winds differ significantly from what you're correcting for during the approach, heads up.

"Wind shear alert [detailed description]" is only at airports with a low-level wind shear alert system. The description includes the airport winds and the winds at a different sensor that conflict, as well as the location of that sensor.

"Braking action reported as [value]" is common in winter when snow and ice are a factor, but can be a factor in heavy rain. The report is coming from a previous landing aircraft.

"Previous aircraft reported [condition]" is the generic way to report anything, from where they broke out of the clouds, to wind shear on final, to birds on the runway.

"[Call sign] continue," means you don't have a landing clearance yet, but should keep flying the approach. Tower may reassure you by adding, "I'll have your landing clearance shortly." Usually, the problem is another aircraft on the runway.

"Low altitude alert, [Call sign] check your altitude immediately," is possible from a tower that has a radar display. Not all do.

"Cleared [Name of approach], circle to [Runway]," is a good thing to hear, if you told Approach you were planning to circle for a different runway than the one you're approaching. The direction you must circle might be included.

After you land, Tower may ask you about the approach, including in-flight visibility, or the altitude at which your acquired the runway. (Word to the wise: Don't report ceilings or visibility lower than the minimums for the approach if you just landed. "Um, yeah. It was right at minimums.")

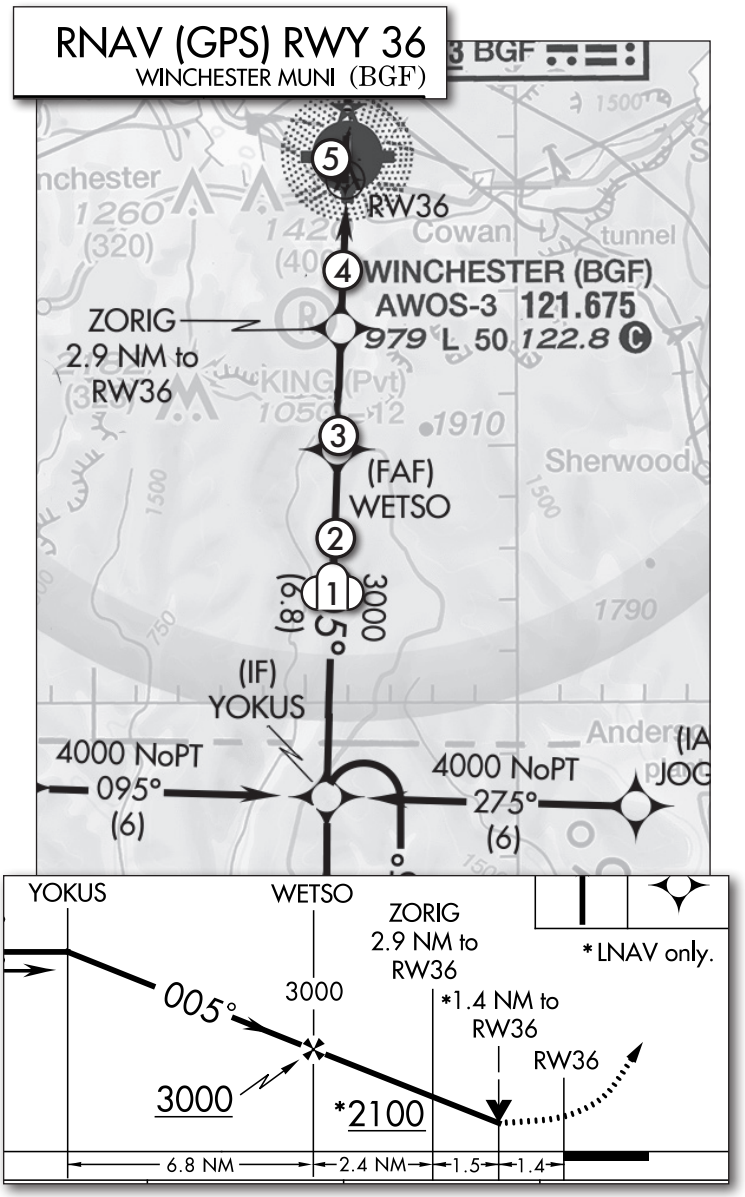
You can also make requests of Tower when you're on approach:

"Wind check," is all you have to say for Tower to read you the current wind speed and direction.

"Turn up/down the runway lights." The tower controller usually has this ability. Turning up the lights is usually only helpful at airports with CAT II or III ILS approaches where there are two extra brightness steps that have a time limit before they overheat. You can request them any time, though.

Turning the lights down is helpful at night, with dark overcast or rain where they can be disorienting if too bright. Likewise you can ask to just have the lead-in flashing lights turned off. Sometimes you'll hear pilots ask for this by saying, "Kill the rabbit."

You get bonus points if you say it in the voice of Elmer Fudd.



① CENTER CONTROLLER
Cirrus Seven Two Bravo, report IFR cancellation this frequency or on the ground via GCO on one two one point seven two. Change to advisory approved.

② PILOT
Change to advisory approved, Cirrus Seven Two Bravo.

③ PILOT (on 122.8)
Winchester Traffic, Cirrus Seven Two Bravo, five miles south at WESTO, instrument approach, straight-in Runway Three Six. Winchester.

④ PILOT
Winchester Traffic, Cirrus Seven Two Bravo, two-mile final, straight-in Runway Three Six. Winchester.

⑤ PILOT
Winchester Traffic, Cirrus Seven Two Bravo, clear Runway Three Six. Winchester.

Winchester Municipal (KBGF)
Winchester, TN
Memphis Center 128.15
CTAF 122.8

Non-towered airports can pose a special IFR communication challenge because you are essentially "leaving the system" of ATC to announce your own position, and listen for other traffic.

As we've shown elsewhere, the approval for changing to the CTAF includes instructions for canceling IFR ①. If you're in VFR conditions and can remain so, it's usually best to cancel IFR right then (see "Canceling Your IFR Flight Plan Without a Tower" on page 95). If not, you'll switch to CTAF and announce your position similar to approaching an airport while VFR.

If the weather is instrument conditions all the way to the airport, you'll be talking to yourself—but do it anyway. You never know if another pilot is out there busting weather minimums, or even operating legally in the barest minimum weather to fly an airport pattern. Your position reports must make sense to VFR pilots who don't know the local instrument approaches. Use the approach chart profile view or GPS to see your distance from the runway. Include that in your transmissions ③④, even if you're still in the clouds. The FAF is usually about five miles from the runway, so make a habit of calling your position from there as one of your position reports.

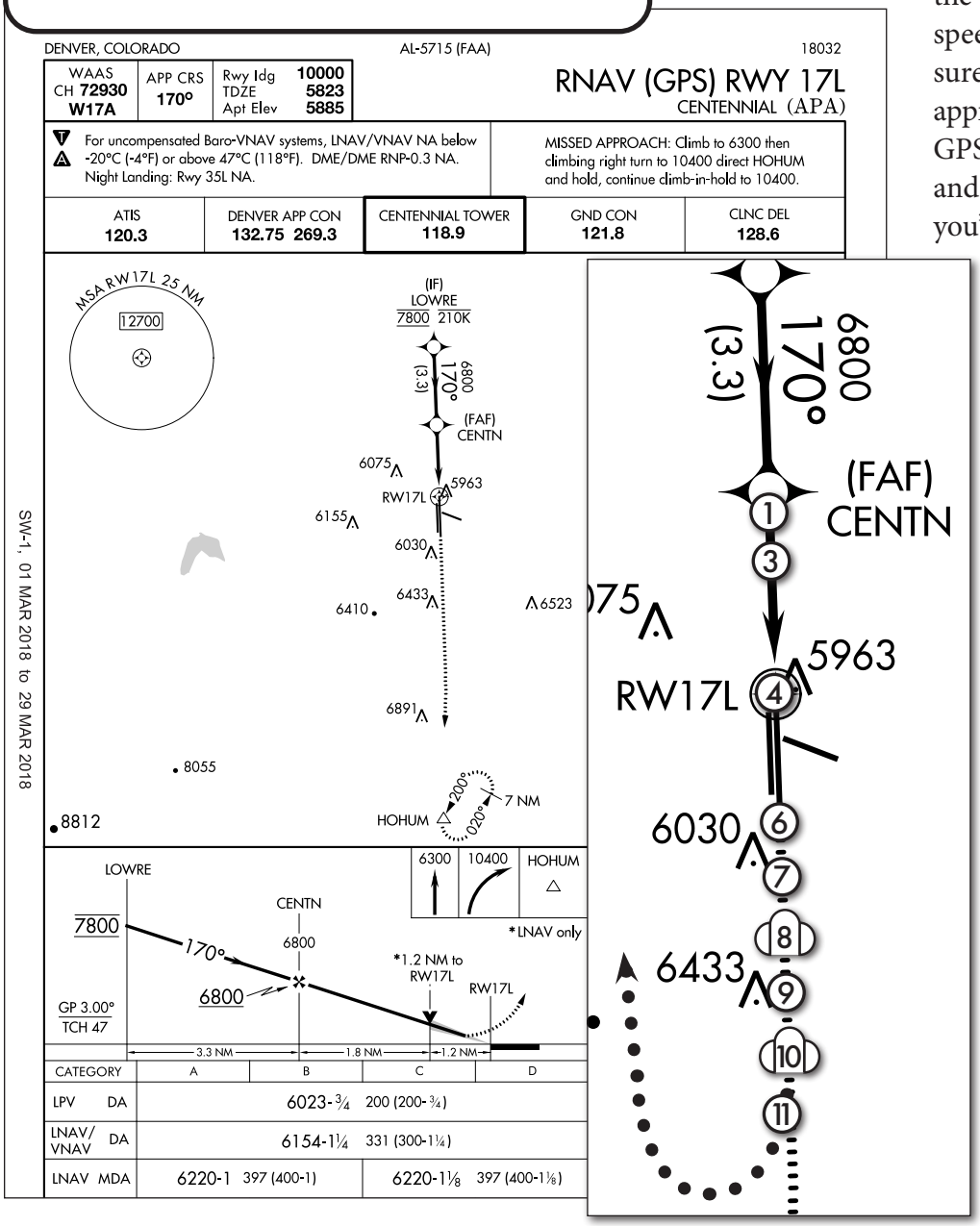
As you get close to the runway, include if you're entering the pattern to circle, or landing straight-in. If it's straight-in, be respectful of aircraft already in the pattern by granting them the right of way.

Announce Missed Approach (Towered Airport)

① PILOT
Centennial Tower, Cirrus Eight Eight Seven Two Bravo, RNAV Runway One Seven Left.

② TOWER CONTROLLER
Cirrus Eight Eight Seven Two Bravo, Runway One Seven Left RVR three thousand. Runway One Seven Left, cleared to land.

③ PILOT
Cleared to land, Cirrus Eight Eight Seven Two Bravo.



The CDI needles are centered. The aircraft is configured on a stable descent for the runway. You've been handed off to Tower, so you check in ①. You get cleared to land—and a heads up this approach might not end in the touchdown zone ②. (See "Things Tower Might Say or You Might Ask, IFR Edition" on page 104 for more conversations you might have on final approach.)

There's no communication required that you might go missed approach. Simply focus on flying the procedure to the decision altitude. If you can land legally, great. If not, it's the classic "Four Cs" of a missed approach: Climb (at climb power and usually on runway heading initially), Clean (reconfigure the aircraft gear, flaps, cowl flaps, speed brakes, etc.), Course (ensure you're following the missed approach procedure and resume GPS sequencing if applicable), and Communicate (tell the Tower you're missed approach ④).

Note that communication is the last step—after the aircraft is safely climbing. Tower often already suspects as they hear the engine(s) spool up.

Tower will usually send you back to the Approach or Center controller you were talking to a moment ago ⑤. If so, it's just a matter of changing back to that frequency, however the frequency will still be included, and the facility is called Departure rather than Approach ⑤. If the name of the facility is different than the airport

Centennial Airport (KAPA)
Denver, CO
Centennial Tower 118.9
Denver Approach 132.75

④ PILOT
Centennial Tower, Cirrus Eight Eight Seven Two Bravo, missed approach.

⑤ TOWER CONTROLLER
Cirrus Seven Two Bravo, fly runway heading, climb and maintain one zero thousand, contact Denver Departure one three two point seven five.

⑥ PILOT
Runway heading, climb and maintain one zero thousand, contact Departure, Cirrus Seven Two Bravo.

name, Denver versus Centennial here, the facility name is also included. At large airports, Tower may assign a new frequency for you to contact. That's usually a different controller.

At a towered airport, Tower will alert Departure that you're on the missed approach, so telling them is optional ⑦. However, you're re-appearing on radar, so the call should include your current altitude ⑦. The controller must positively identify you and your mode C altitude, hence the ident ⑧.

The controller will also ask what you want to do now ⑧, and may ask why you went missed or did a go-around. If you have a plan, go ahead and let ATC know ⑨. If not, it's perfectly acceptable to say, "standby," or even, "We're not sure. Request delay vectors to figure this out."

Once you've been radar identified and you've climbed above any minimum altitude for vectors, the controller can either get you going to your alternate, vector you for another approach attempt, or give you vectors to just keep you clear of terrain while you figure out your next move, a.k.a., delay vectors.

The last step of a missed approach is a new clearance ⑩. This is a critical point: Your IFR clearance includes clearance to fly the missed approach. Even though your clearance limit was the airport, the last point you were cleared to was the MAHP. In order to leave the missed approach procedure, you need a new IFR clearance to a new destination. Read that back as appropriate ⑪, and then proceed on your way.

⑦ PILOT (on 132.75)
Denver Departure, Cirrus Eight Eight Seven Two Bravo, missed approach Centennial, seven thousand two hundred climbing one zero thousand.

⑧ DEPARTURE CONTROLLER
Cirrus Seven Two Bravo, ident, say altitude leaving and intentions.

⑨ PILOT
Ident, seven thousand nine hundred, and we'd like vectors to Rocky Mountain Metro. Cirrus Seven Two Bravo.

⑩ DEPARTURE CONTROLLER
Cirrus Seven Two Bravo, radar contact three miles south of Centennial Airport. Cleared to the Rocky Mountain Metro Airport via radar vectors. Turn right heading three four zero, climb and maintain niner thousand.

⑪ PILOT
Cleared to Rocky Mountain Metro via radar vectors, right three four zero, climb and maintain niner thousand. Cirrus Seven Two Bravo.

"REQUEST DELAY VECTORS"

An under-utilized pilot request is for "delay vectors." It's literally asking ATC to vector you in circles (well, usually squares) while you sort out a problem.

Delay vectors take the navigation task off your shoulders, which frees up brain cycles for something else, like what to ask for now that you can't land where you planned. Once you're ready, make your new request of ATC, and get on your way.

Announce Missed Approach (Non-Towered Airport)

① PILOT
Soccoro Traffic, Cirrus Seven Two Bravo, three miles south at OBNAE on the RNAV approach to Runway Three Three. Soccoro.

② PILOT
Soccoro Traffic, Cirrus Seven Two Bravo, departing the area to the northeast, missed approach. Soccoro.

③ PILOT (on 124.32)
Albuquerque Center, Cirrus Seven Two Bravo, missed approach at Socorro. Six thousand one hundred climbing eight thousand.

④ CENTER CONTROLLER
Cirrus Seven Two Bravo, roger. Say intentions.

⑤ PILOT
We were late getting down and I think we could make it if we tried again. We'd like direct HETUD.

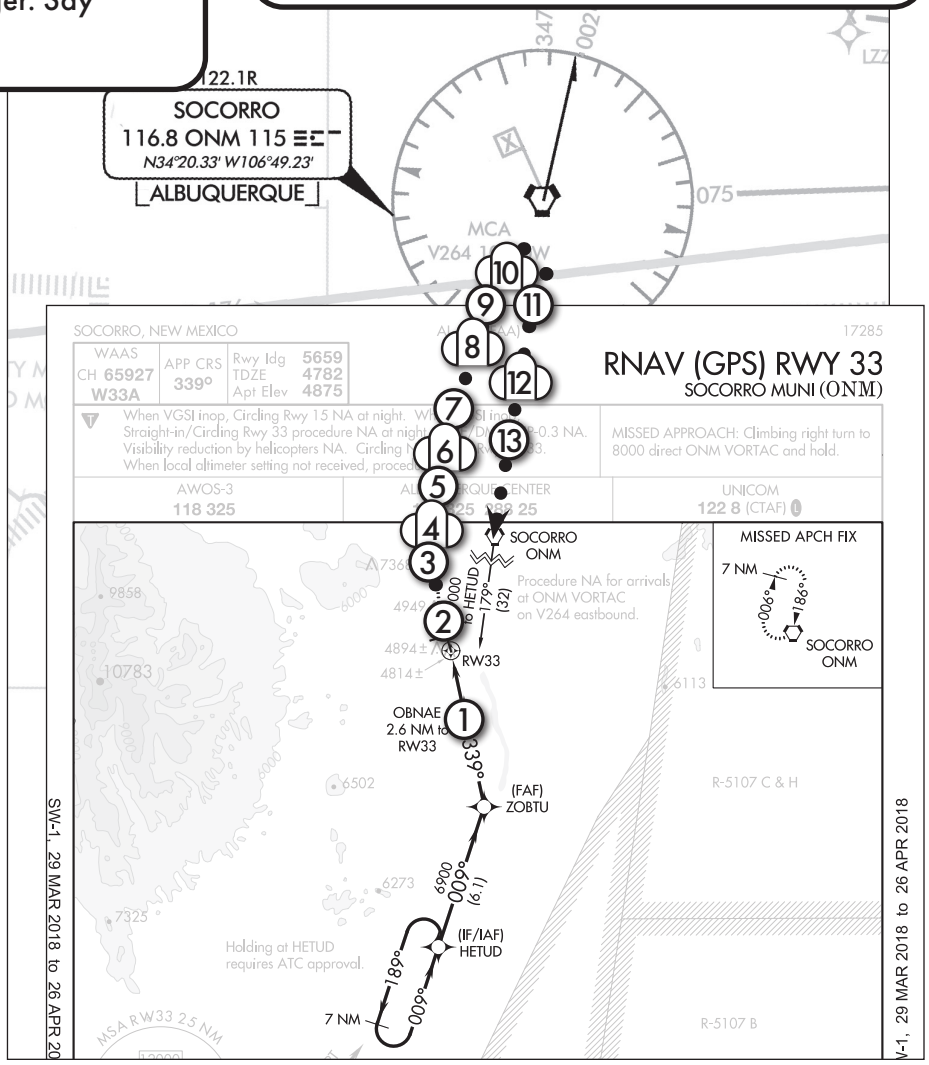
⑥ CENTER CONTROLLER
Roger. I'll let you know when I get you on radar. Maintain eight thousand. Albuquerque altimeter two niner seven niner.

⑦ PILOT
Two niner seven niner. Cirrus Seven Two Bravo

⑧ CENTER CONTROLLER
Cirrus Seven Two Bravo, ident and say altitude.

Flying a missed approach at a non-towered airport follows the same rules as flying the approach to landing (page 105). Announce your position on CTAF, including a distance and direction to the runway for any VFR-only pilots in the area ①.

If you commence the missed approach, make a traffic call that you're departing the area and the general direction of the missed approach course ②. Here it's straight out, but it could be a turn, or even a complete reversal to cross back over the airport and back the way you came.

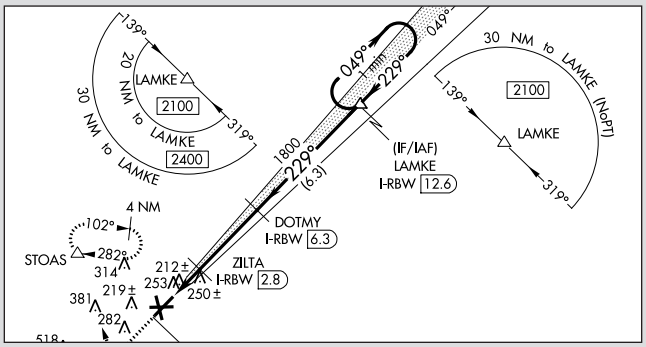


Socorro Municipal (KONM)
Socorro, NM
CTAF 122.8
Albuquerque Center 124.32

TERMINAL ARRIVAL AREAS SIMPLIFY VECTORS AND COMMUNICATIONS

During the evolution of RNAV approaches, someone had the bright idea of replacing fixed courses to the IAF with one or more pie slice-shaped Terminal Arrival Areas (TAAs). These are designated volumes of airspace that guarantee obstacle clearance while transitioning from the enroute structure to the initial approach course. TAAs are even appearing on ILS approaches, with the note "GPS required" to fly the TAA portion.

A TAA is considered an approach segment, so if you're inside it when you receive your clearance, the controller won't include an altitude restriction. Once you've been cleared for the approach, you're expected to fly the altitude for your approach sector. If you're outside the TAA when you receive your clearance, you'll hear: "Cleared direct [fix name]. Maintain at or above [altitude] until entering the TAA. Cleared [approach name] approach." That's uncommon as TAAs normally extend 30 NM from their IAF(s). (RNAV approaches commonly have three IAFs).



Only once you're climbing, cleaned up, and on course, do you contact ATC (Climb, Clean, Course, Communicate). If they get you on radar right away, the process is similar to a towered airport: ATC will ask your intentions, and you reply as appropriate.

If this non-towered airport is further from a radar site, or the controlling facility is a Center rather than an Approach, you may be following the published missed approach procedure for a while as you climb. Once you're in radar contact and above any minimum altitudes, you can get vectors to expedite your next move as needed. As with any missed approach, your options are to try again, or go elsewhere.

MISSED APPROACH BELOW RADAR

It's always important to brief your complete approach, through the missed approach procedure, before you fly an instrument approach in actual conditions.

However, there's extra immediacy when it's a non-towered airport. Once you change frequencies, ATC can't warn you if they see you straying off course or too low. That's if they could see you on radar at all. The same is true when you fly the missed approach. They can't help until they see and hear you. Be ready to fly the missed as published to the MAHP.

⑨ PILOT
Ident and eight thousand. Cirrus Seven Two Bravo.

⑩ CENTER CONTROLLER
Cirrus Seven Two Bravo, radar contact eight miles south of the Socorro VOR. Turn right heading one eight zero, direct HETUD when able. Climb and maintain niner thousand.

⑪ PILOT
We're direct HETUD now. Leaving eight thousand for niner thousand. Cirrus Seven Two Bravo.

⑫ CENTER CONTROLLER
Cirrus Seven Two Bravo, cross HETUD at or above niner thousand, cleared RNAV Runway Three Three approach. Report IFR cancellation this frequency or on the ground. Good luck this time.

⑬ PILOT
Cleared RNAV Runway Three Three approach. Thanks, we'll do our best. Cirrus Seven Two Bravo.

Request Published Missed Approach (and Fly It)

1 APPROACH CONTROLLER
Cirrus Seven Two Bravo, how will this approach terminate?

2 PILOT
We'd like to fly the published missed approach. Cirrus Seven Two Bravo.

3 APPROACH CONTROLLER
Cirrus Seven Two Bravo, cross EBBIL at or above three thousand, cleared RNAV Runway Seven approach, change to advisory approved.

4 PILOT
Cross EBBIL at or above three thousand, cleared RNAV Runway Seven approach, switch to advisory, Cirrus Seven Two Bravo.

After flying a low approach to Runway 7 ...

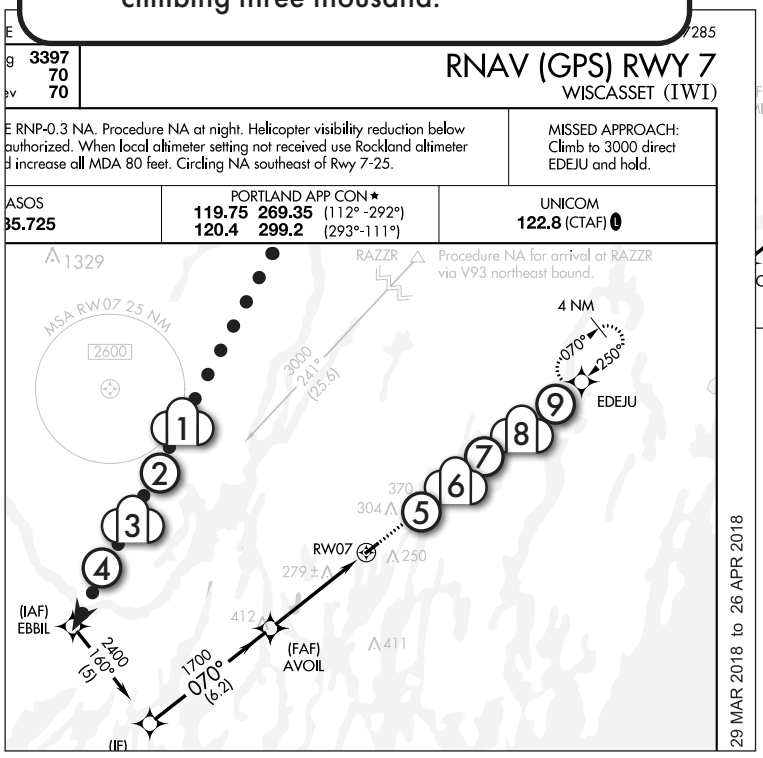
5 PILOT
Portland Approach, Cirrus Eight Eight Seven Two Bravo, missed approach Wiscasset, one thousand one hundred climbing three thousand.

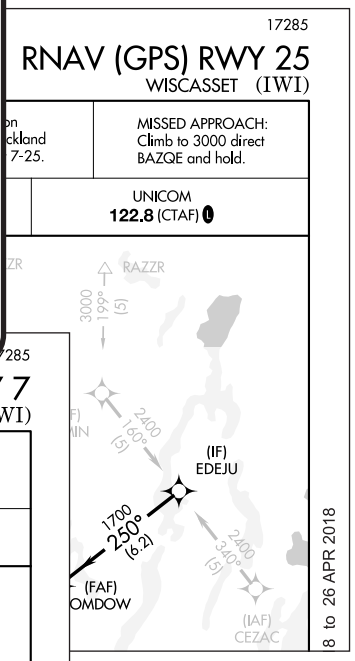
6 APPROACH CONTROLLER
Cirrus Seven Two Bravo, Portland Approach, radar contact two miles northeast of Wiscasset airport. You're just going to hold at EDEJU?

7 PILOT
We'll do a few turns in the hold and then we'd like the RNAV Runway Two Five Approach from EDEJU.

8 APPROACH CONTROLLER
Roger, maintain three thousand. Just let me know when you're ready.

9 PILOT
Wilco. Thanks. Cirrus Seven Two Bravo.





Wiscasset Airport (KIWI)
Wiscasset, ME
Portland Approach 119.75

When you're in radar contact, it's rare to fly the entire published missed approach procedure—unless you want to.

If you're out practicing, or logging required holding patterns, let the controller know before you're cleared for the approach that you want to fly the published missed ②. That controller can coordinate with Tower, if appropriate, or simply expect you to pop up after a low approach at a non-towered airport.

Once you're on the missed approach, the controller will want to know your plans ⑥. Clearly, you don't want to hold forever. The controller may give you an "expect" instruction, just in case of lost comm. You might have to hold other than the published altitude while you fly racetracks, just to stay out of the way.

Charles B. Wheeler Downtown Airport (KMKC)
Kansas City, MO
Kansas City Approach 118.4

Most instrument approaches take you fix-by-fix from the enroute structure down to the runway. That's a problem if you can't identify the fix due to equipment failure (including failure to have it installed in the aircraft). If ATC has an accurate position for you on radar, the controller may be able to identify a fix for you.

If the approach chart shows RADAR beside a fix in the plan view, or above it in the profile view, then you know ATC can provide an alert when you cross the fix. All you need do is ask ②. Using radar to ID a fix might mean a later handoff to Tower or CTAF, and the controller might be a couple seconds early or late on making the call. Talking to you must fit into all the other air traffic control tasks.

You can ask a controller to call the crossing of any fix, be it in the enroute structure or on approach outside the FAF. The controller might say yes ... or might decline. It takes extra attention to actively keep track of you, and radar coverage may be inadequate.

Having a controller call a fix inside the FAF for you is trickier. You're lower and less likely to appear on radar. If there's a tower at the airport with a radar feed that sees low enough, that's usually fine. For a non-towered field, you'll have to monitor two frequencies, CTAF and Approach.

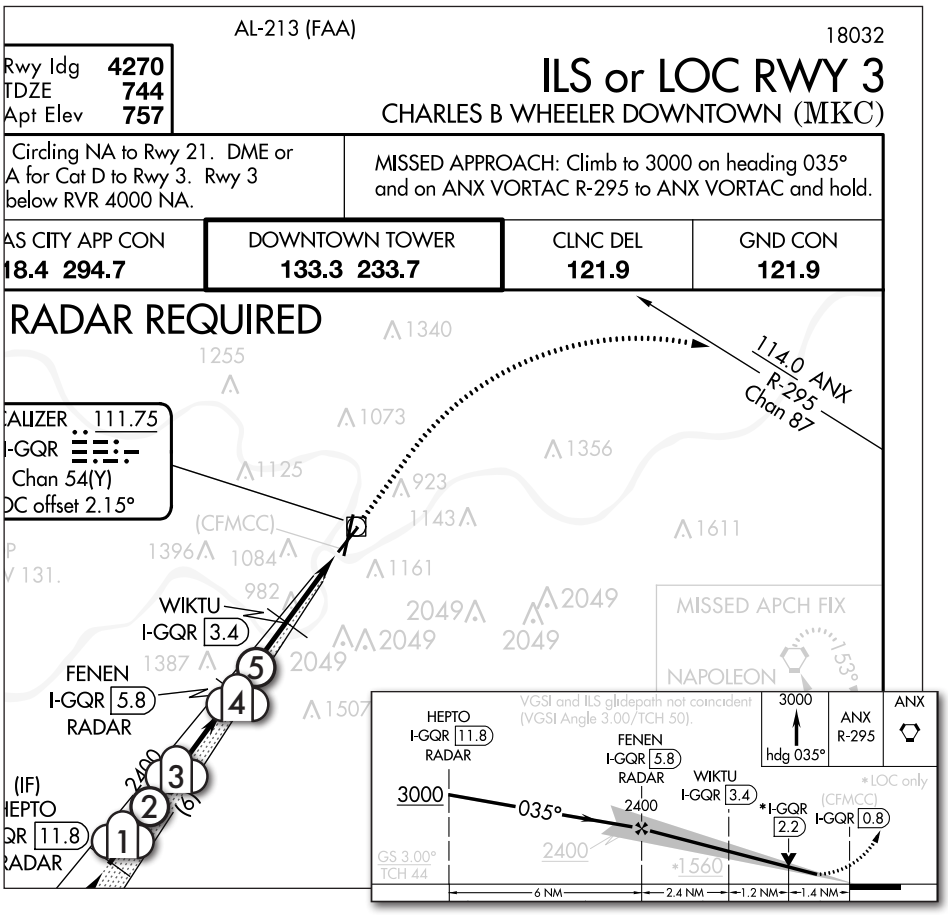
① APPROACH CONTROLLER
Cirrus Seven Two Bravo, five miles from FENEN, cleared ILS Runway Three approach.

② PILOT
Approach, Cirrus Seven Two Bravo, our DME isn't working. Could you call crossing FENEN for us?

③ APPROACH CONTROLLER
Affirmative. We're a full-service shop.

④ APPROACH CONTROLLER
Cirrus Seven Two Bravo, you're crossing FENEN now. Contact Tower one three three point three.

⑤ PILOT
Contact Tower. Thanks for the help. Cirrus Seven Two Bravo.



TIP

When an Approach Chart says, "Radar Required" in the plan view, that's because you can't proceed fix-by-fix from enroute to approach. There is no IAF and you must be vectored onto the approach.

Receive Guidance for an ASR Approach

① PILOT
Key West Approach, Cirrus Eight Eight Seven Two Bravo, four thousand, information Oscar, request ASR Runway Two Seven approach to Key West.

② APPROACH CONTROLLER
Cirrus Eight Eight Seven Two Bravo, Key West Approach, we can do that. Fly heading two three zero, vectors for the ASR Runway Two Seven approach. The published minimum descent altitude is four hundred forty. Descend and maintain one thousand five hundred. Key West altimeter two niner niner seven.

③ PILOT
Heading two three zero, leaving four thousand for one thousand five hundred, altimeter two niner niner seven. Cirrus Eight Eight Seven Two Bravo.

④ APPROACH CONTROLLER
Cirrus Seven Two Bravo, verify this will be a gyro approach?

⑤ PILOT
Affirmative, Cirrus Seven Two Bravo.

⑥ APPROACH CONTROLLER
Cirrus Seven Two Bravo, contact final approach controller on one three three point seven five.

⑦ PILOT
Contact Approach one three three point seven five. Cirrus Seven Two Bravo.

It's possible to fly an instrument approach without any navigation equipment on board. The Airport Surveillance Radar approach (ASR, sometimes shown as SRA or SRE internationally) has the controller guiding your aircraft laterally, and letting you know your distance from the FAF and the runway. All it requires in the aircraft is an operable radio and transponder.

Few airports offer ASR. If the airport does, you'll see "ASR" in the briefing strip of all the Approach Charts for that airport. Jeppesen users get an actual approach chart for the ASR. Everyone else has to reference the Terminal Procedures Publication (TPP) for the area of the country in question to find the Radar Minimums, or ask ATC to look up the MDA and visibility requirements (see "Things You Can Ask from ATC in a Pinch" on page 118). ATC may give you the information anyway ②.

Make your request on first contact with the facility that would offer the service ①. You may be asked if this is a no-gyro or gyro ASR ④. The former is for gyro instrument failure and doesn't use headings (page 120). At some point, you will be handed to a final controller on a discrete frequency ⑦. From this point, you only need to acknowledge altitude changes. The controller will provide guidance in the format:

> [Call sign], [Course position], [Correcting/diverging], [Rate of correction], [Heading (if needed)].

The controller should speak about every 15 seconds (three times as many transmissions as shown in ⑩-⑮) and should have issued instructions if you lose contact ⑨. Simply transmit "Radio check," if you're get worried. As you get close, Approach may relay a landing clearance, "Cleared to land Runway Two Seven, contact Tower one one eight point two on rollout." Runway distances are spoken each mile, unless requested by the pilot.

ASRs have no published missed approach. Unless ATC gave instructions otherwise, climb straight ahead and try to reestablish contact.

KEY WEST, FLORIDA

WAAS CH 82100 W27A | APP CRS 273°

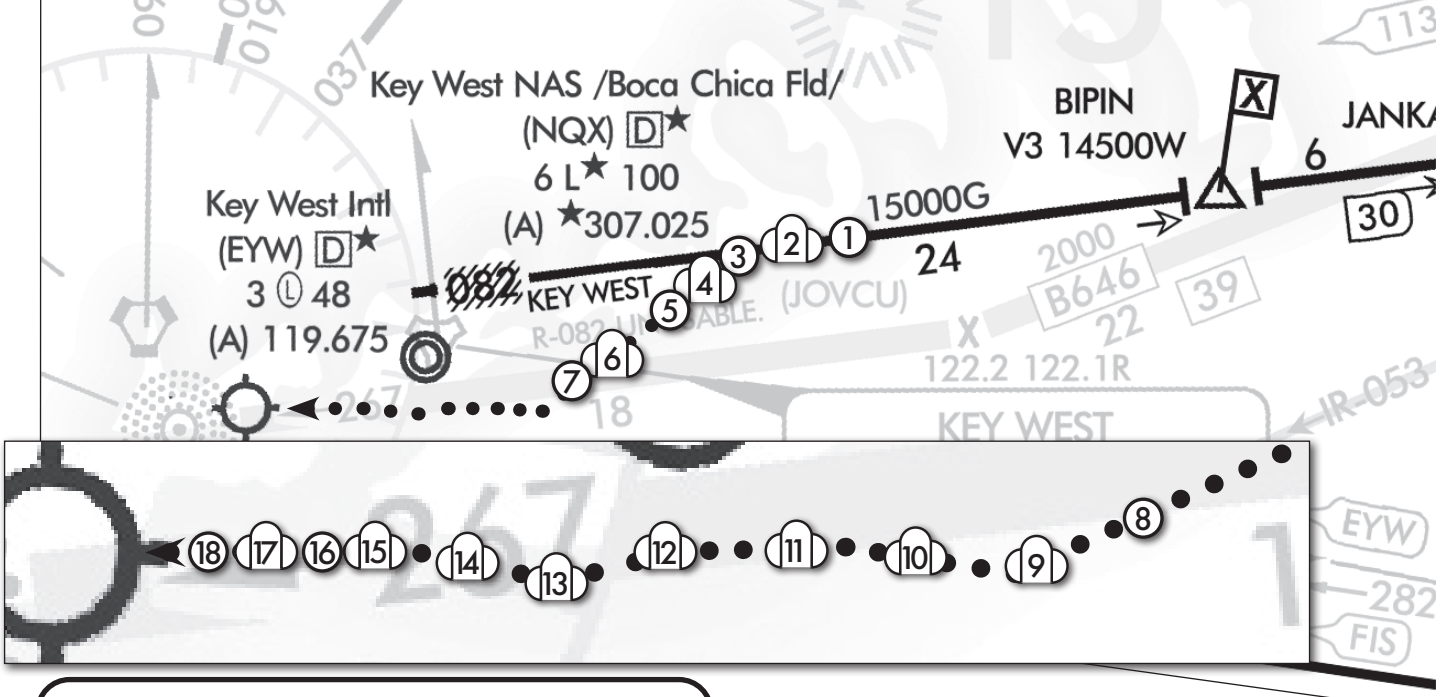
DME/DME RN received, use K Rwy 27 helicop

ASR

RADAR INSTRUMENT APPROACH MINIMUMS

KEY WEST, FL Amdt 5, 19SEP13 (14149) (FAA) ELEV 3
KEY WEST INTL (EYW)
RADAR-1 124.025 313.7

	RWY	GP/TCH/RPI	CAT	DA/ MDA-VIS	HAT/ HATh/ HAA	CEIL-VIS	CAT	DA/ MDA-VIS	HAT/ HATh/ HAA	CEIL-VIS
ASR	27		AB	**440**-1	437	(500-1)	CD	**440**-1¼	437	(500-1¼)
	9		AB	**460**-1	457	(500-1)	C	**460**-1⅜	457	(500-1⅜)
CIRCLING	ALL RWY		AB D	**500**-1 **620**-2	497 617	(500-1) (700-2)	C	**620**-1¾	617	(700-1¾)



Key West International Airport (KEYW)
Key West, FL
Navy Key West Approach 124.02
Navy Key West Approach 133.75
Key West Tower 118.2

⑧ PILOT (on 133.75)
Navy Key West Approach, Cirrus Eight Eight Seven Two Bravo, one thousand five hundred.

⑨ APPROACH CONTROLLER
Cirrus Seven Two Bravo, this will be vectors for the ASR Runway Two Seven Approach. No acknowledgment needed except to report the runway in sight. Missed approach point at the runway threshold. If no transmissions received for fifteen seconds on final approach, attempt contact one one eight point two and proceed visually. Seven miles from runway threshold. Fly heading two seven five.

⑩ APPROACH CONTROLLER
Cirrus Seven Two Bravo, slightly left of course correcting slowly.

⑪ APPROACH CONTROLLER
Cirrus Seven Two Bravo, turn left heading two seven zero, six miles from runway, prepare to descend to minimum descent altitude in one mile.

⑫ APPROACH CONTROLLER
Cirrus Seven Two Bravo, five miles from runway, on course, descend to your minimum descent altitude.

⑬ APPROACH CONTROLLER
Cirrus Seven Two Bravo, four miles from runway, slightly left of course, fly heading two seven five.

⑭ APPROACH CONTROLLER
Cirrus Seven Two Bravo, three miles from runway, sightly left of course, correcting slowly.

⑮ APPROACH CONTROLLER
Cirrus Seven Two Bravo, two miles from runway, on course.

⑯ PILOT
Runway in sight, Cirrus Seven Two Bravo.

⑰ APPROACH CONTROLLER
Cirrus Seven Two Bravo, take over visually, contact Tower one one eight point two.

⑱ PILOT
Over to Tower. Cirrus Seven Two Bravo.

Request Practice Approaches Under VFR

① PILOT
Chicago Approach, Cirrus Eight Eight Seven Two Bravo, five west of Dupage VOR, request.

② APPROACH CONTROLLER
Cirrus Seven Two Bravo, go ahead.

③ PILOT
We'd like VFR practice approaches at Aurora, starting with vectors for the localizer Runway Three Three.

④ APPROACH CONTROLLER
Cirrus Seven Two Bravo, squawk two six six two and ident.

⑤ PILOT
Two six six two and we're at three thousand five hundred, Cirrus Seven Two Bravo.

⑥ APPROACH CONTROLLER
Cirrus Seven Two Bravo, radar contact four miles southwest of Dupage. Maintain VFR, fly heading one six zero, vectors for the localizer Runway Three Three approach, descend and maintain two thousand six hundred.

⑦ PILOT
Maintain VFR, heading one six zero, leaving three thousand five hundred for two thousand six hundred. Cirrus Seven Two Bravo.

⑧ APPROACH CONTROLLER
Cirrus Seven Two Bravo, what are your intentions after this approach?

⑨ PILOT
After a low approach, we'd like the RNAV Runway Nine from DECAK. Cirrus Seven Two Bravo.

Practicing your approaches under VFR falls into a potentially confusing morass when it comes to communication. ATC instructions during VFR practice approaches sound like instructions when IFR, but they are not an instrument clearance—you must maintain VFR cloud clearance and visibility. Clouds aren't depicted on the radar scope. You're responsible for keeping the required distance.

The key to a good VFR practice request is clarity. Ask for exactly what you want, but keep it on topic ③. The controller doesn't need to hear you're dusting off the rust after a long winter out of the cockpit.

VFR practice approaches come in two forms: One is where separation services are provided. In this case, you'll get assigned altitudes when on a vector ⑥, and guaranteed separation from any IFR traffic once cleared for an approach. If that's not available, you should be told, "No separation services provided," and you'll hear, "Practice approach approved," rather than "Cleared [name] approach."

Clearance to fly an approach under VFR does *not* include clearance to fly the missed approach. After the approach, you climb back up, and contact the controller with the next request. That's why it's often best to keep the controller informed of what you want next ⑨. If you don't, the controller may ask ⑧. An advantage of setting this up ahead of time is getting missed approach instructions that set you up for the next approach.

You don't need to be IFR current—or even instrument rated—to fly VFR practice approaches. It's a great way to get current or learn with ATC's help.

Aurora Municipal Airport (KARR)
Chicago, IL
Chicago Approach 133.5
Aurora Tower 120.6

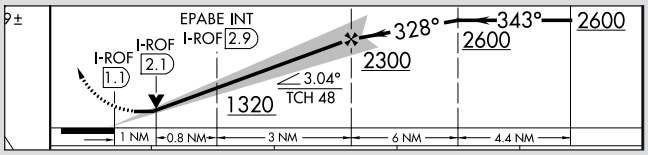
TIP

When receiving practice approaches under VFR, be extra conscientious about airspace. Under IFR, you don't need to worry about flying through Class B, or special use, airspace. Your IFR clearance or vector is enough. Not so under VFR, and the controller might not notice in time.

"VFR ALTITUDE YOUR DISCRETION"

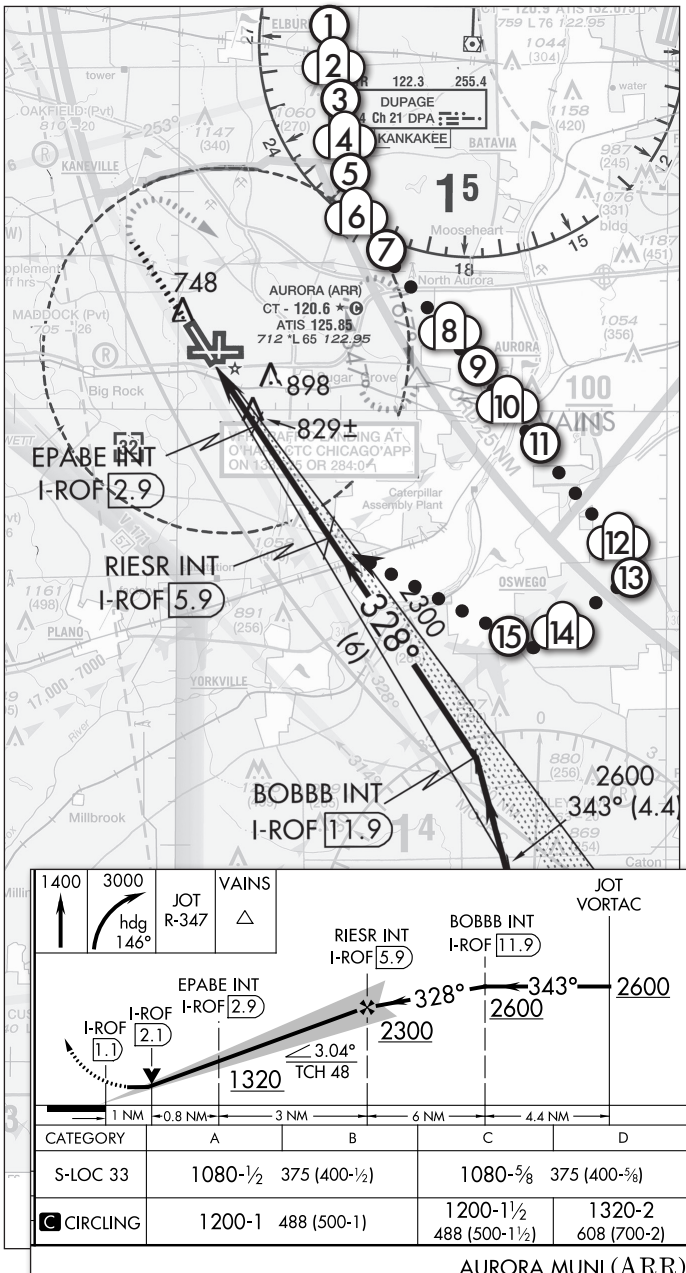
A common confusion on VFR practice approaches is whether you must ask to change altitudes. Many pilots doing instrument practice under VFR have motored along getting closer and closer to the final approach course, waiting for the controller to issue a descent that never comes. Finally, they ask if they can descend only to hear, "VFR altitude your discretion."

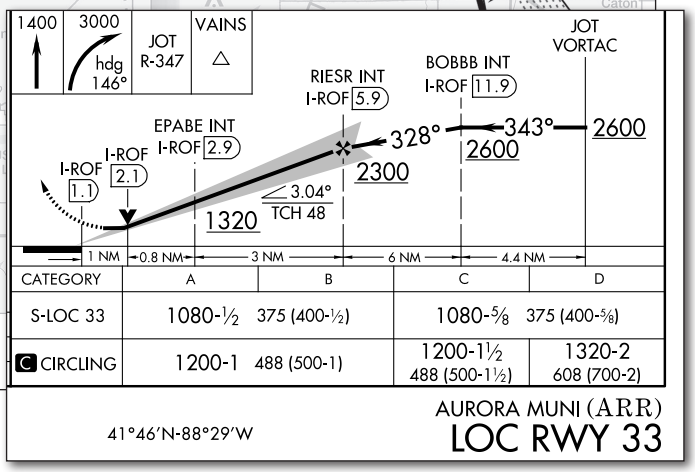
Unless you were assigned an altitude or a restriction, such as "Maintain at or below 5000 for traffic ...", then you may fly any altitude you wish as you fly the approach. That said, it's polite to notify



ATC if you change altitudes, especially in a busy environment. You'd simply say you were descended to [altitude] rather than requesting a descent to [altitude]. You'll probably hear the same "VFR altitude your discretion" anyway.

ATC assumes you'll fly the published altitudes once you're on the approach. If that's not your plan, it's best to alert the controller beforehand.





CATEGORY	A	B	C	D
S-LOC 33	1080-½ 375 (400-½)		1080-⅝ 375 (400-⅝)	
C CIRCLING	1200-1 488 (500-1)		1200-1½ 488 (500-1½)	1320-2 608 (700-2)

41°46'N-88°29'W

AURORA MUNI (ARR)
LOC RWY 33

(10) APPROACH CONTROLLER
Cirrus Seven Two Bravo, you can expect that. On completion of the approach, fly runway heading, climb and maintain three thousand, maintain VFR, Departure on this frequency.

(11) PILOT
After the approach, fly runway heading to three thousand, contact you. Cirrus Seven Two Bravo.

(12) APPROACH CONTROLLER
Cirrus Seven Two Bravo, fly heading two four zero.

(13) PILOT
Two four zero, Cirrus Seven Two Bravo.

(14) APPROACH CONTROLLER
Cirrus Seven Two Bravo, four miles from RIESR, fly heading three three zero until established on the localizer. Cleared localizer Runway Three Three approach. Contact Aurora Tower now on one two zero point six. See you in a bit.

(15) PILOT
Heading three three zero until established, cleared for the approach, contact Tower. Cirrus Seven Two Bravo.

Handle Lost Communications

① PILOT
Knoxville Approach, Cirrus Eight Eight Seven Two Bravo, seven thousand.

Nearly unintelligible in static:

② APPROACH CONTROLLER
... calling ... unreadable ...

③ PILOT (using second radio)
Knoxville Approach, Cirrus Eight Eight Seven Two Bravo, seven thousand.

Nothing but static, even with open squelch ...*

④ PILOT (on 133.6)
Atlanta Center, Cirrus Eight Eight Seven Two Bravo. How do you hear?

An endless sea of voiceless radio fuzz ...

⑤ PILOT (on 121.5)
Any station, Cirrus Eight Eight Seven Two Bravo, on one two one point five.

Lonely static ...

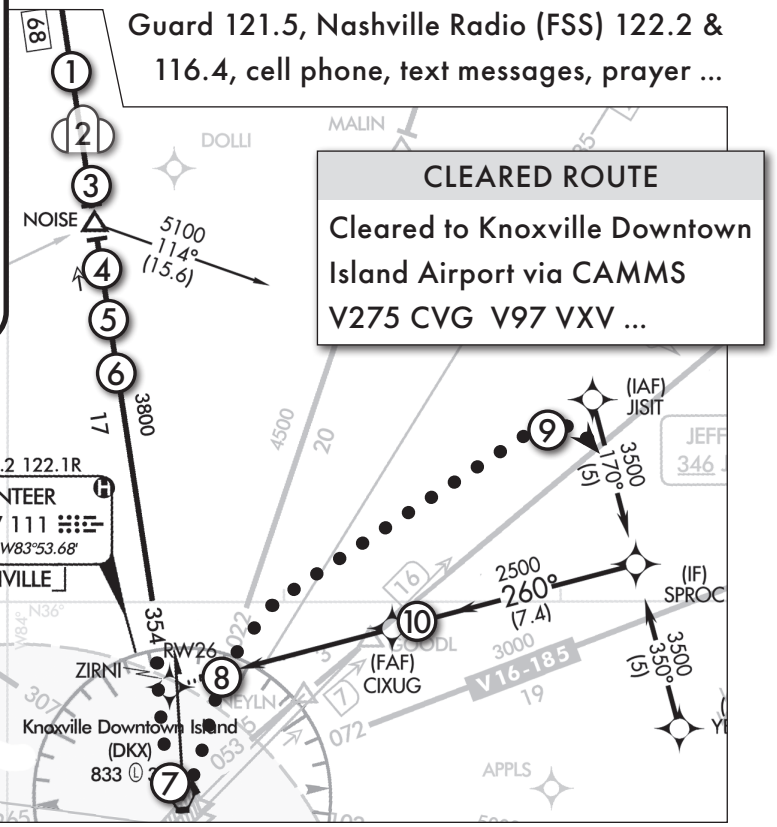
⑥ PILOT (on 122.2 while monitoring 116.4)
Nashville Radio, Cirrus Eight Eight Seven Two Bravo, on one two two point two, monitoring Volunteer VOR one one six point four.

It's unlikely, but it's the classic IFR emergency. You're IMC, and your radios have been static riddled the whole flight. You're handed off to Approach just north of NOISE intersection—and that's all you hear.

Don't panic. See if the transmit light on your radio is on, indicating you can't hear because you have a stuck mic. Try your other comm radio if you have two ③. Try the last frequency you were on ④. Open the squelch (see tip this page). Check your headset connections. Try using the handheld mic and listening on the cabin speaker.

If you're still alone in the clouds, try broadcasting on Guard, which is 121.5. Guard is monitored by all ATC and FSS stations, as well as many pilots ⑤. (In fact, pilots are required to monitor Guard whenever practical.) You might end up relaying a message through another aircraft. Airliners flying high above you make great relays. Still no response? As a last attempt, you can try listening over a VOR ⑥. Got a cell phone? Try it. You can even try texting a pilot friend to relay a message for you.

Knoxville Downtown Island Airport (KDKX)
Knoxville, TN
Knoxville Approach 123.9, Atlanta Center 133.6, Guard 121.5, Nashville Radio (FSS) 122.2 & 116.4, cell phone, text messages, prayer ...



***TIP**

If you're having trouble hearing someone on the radio, try opening the squelch setting (usually, a push or pull on the volume control). You'll hear constant static, but also weak transmissions. This works for distant ATIS or ASOS broadcasts, too.

This radio thing just isn't happening ...

⑦ PILOT (on 121.5)
Cirrus Eight Eight Seven Two Bravo, transmitting in the blind. Crossing Volunteer VOR at seven thousand. Next is Knoxville Downtown Airport.

⑧ PILOT (on 121.5)
Cirrus Eight Eight Seven Two Bravo, transmitting in the blind. Crossing Knoxville Downtown Airport at seven thousand. Next is JISIT waypoint.

⑨ PILOT (on 121.5)
Cirrus Eight Eight Seven Two Bravo, transmitting in the blind. Crossing JISIT, leaving seven thousand for three thousand five hundred. RNAV Runway Two Six Knoxville Island Downtown.

⑩ PILOT (on 121.5)
Cirrus Eight Eight Seven Two Bravo, transmitting in the blind. Crossing CIXUG, RNAV Runway Two Six Knoxville Island Downtown.

If after five minutes trying every option, you still can't get through, squawk 7600. This sets off alarms in all the ATC facilities just like 7700 (mayday), except it specifically means you just can't communicate. See if the reply light on your transponder is flashing. This could be a real light or an "R" on the LCD screen. That means ATC radar is reaching your transponder, so at least they can see where you are.

Follow the rules of FAR 91.185. However, there is always the possibility someone can hear you even if you can't hear them. Don't give up. Continue to broadcast your intentions ⑧-⑩ on 121.5. Listen as well. You may finally get reception as you continue on your flight, and any ATC facility can reach you on Guard.

WHEN LOST COMM IS NO SURPRISE

One controller usually transmits via multiple antennas located around the sector. If you're having trouble hearing clearly and it's getting worse, you can ask the controller if he or she has another transmitter they can try. It might not even be a frequency change for you.

Believe it or not, there are times when your controller tells you that you might fly out of radio coverage at your current altitude. If you can't climb, that controller may give you a new frequency to try in a certain number of miles or minutes. That frequency might even be a whole new ATC facility. Don't panic. Don't change your squawk code. Everyone knows where you are and what the plan is. Simply try the new facility when you get in range.

If you can't raise anyone well past the distance or time you expected, then try other lost comm techniques to reestablish contact.

FAR 91.185: AVE-F AND MEA

If it's been a while since your IFR checkride, here's a way to remember the route and altitude to fly when lost comm: AVEnue F and MEA.

AVE-F is for your route, and its in priority order. Fly the route:

- **Assigned** in your last clearance from ATC.
- Direct the fix you were being **Vectored** to.
- You were told to **Expect.**
- **Filed** in your flight plan.

MEA is for altitude. Fly the highest of:

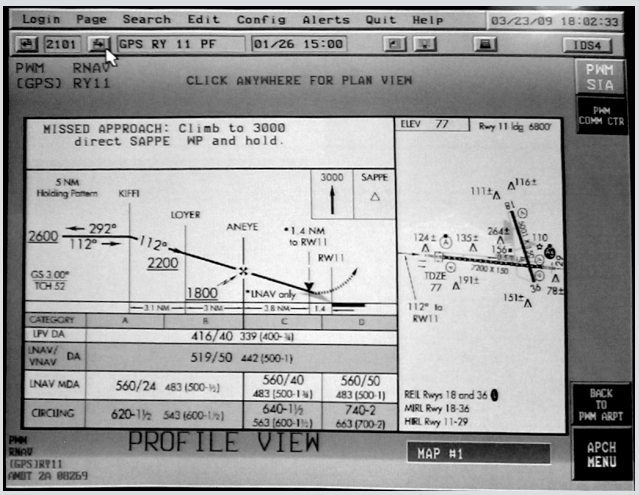
- The **Minimum** for your location.
- The altitude you were told to **Expect**.
- Your last **Assigned** altitude.

All this becomes moot if you break out into VFR conditions. You land at the nearest airport, and resolve the problem with a phone call.

Above all with lost comm, remember that even the FAA admits you may have to get creative, and regs can't cover it all (see AIM 6-4-1).

THINGS YOU CAN ASK FROM ATC IN A PINCH

Presuming you can talk to ATC, your controller is your on-the-ground crewmember when it comes to emergencies. Some situations are urgent, or even life threatening, while IFR that just wouldn't be as critical when flying VFR. For example, you could be low on fuel and have to make an approach to an airport—and then have the tablet with all your approach information fall off your lap and under the seat out of reach. How can you fly the approach without the chart?



The solution is asking your on-the-ground crewmember: your controller. Controllers have access to vast information at their fingertips, including airport information and charts. Controllers can also call in other experts, like other pilots, or try to find an expert on the aircraft system that's causing you problems.

Even if you don't declare an emergency, you can still ask for this information. It could be as simple as flying partial panel and not wanting to even look up a frequency. Ask ATC instead.

REQUIRED REPORTS WHEN FLYING IFR

Next time you're doing some light reading in the AIM, check out 5-3-3 "Additional Reports." You'll learn there are 16 different conditions you must report to ATC, if they occur under IFR. Some folks try to commit the list to memory with the acronym "MARVELOUS VFR C500."

Unless you're practicing for aviation trivia night, don't bother. Instead, focus on the few that you'll routinely encounter and matter most to ATC, plus a dose of common sense.

Critical reports you should commit to memory:

- Going missed approach
- Vacating an altitude or flight level
- VFR-on-top altitude changes
- Entering a hold (report time and altitude)
- Leaving a hold

"No-duh" reports you'd probably do naturally:

- Anything detrimental to safety of flight
- Unforecast weather
- Radio or navigation failure (Might be challenging to report if it was *all* radios.)

Reports you're technically required to make, but people rarely do and controllers generally couldn't care less about:

- Airspeed (±10 knots or 5% off filed TAS)
- ETA ± 2 minutes of filed (±3 North Atlantic)
- Can't climb or descend >500 FPM

Reports you only make if not in radar contact, and kinda do matter, so do your best:

- FAF or outer marker inbound
- Compulsory reporting points

That wasn't so hard, was it? If you must, write 'em down on your kneeboard somewhere.

① APPROACH CONTROLLER
Cirrus Seven Two Bravo, descend and maintain five thousand, expect vectors RNAV Runway Three Zero approach to Littlebrook.

② PILOT
Leaving seven thousand for five thousand, expect vectors RNAV Runway Three Zero. Cirrus Seven Two Bravo.

With an INTEG annunciation on both GPSs:

③ PILOT
Boston Approach, Cirrus Seven Two Bravo.

④ APPROACH CONTROLLER
Cirrus Seven Two Bravo, Boston Approach, go ahead.

⑤ PILOT
Cirrus Seven Two Bravo has lost GPS navigation, so we're now slant Uniform and unable RNAV approach. Are there any reported GPS outages?

⑥ APPROACH CONTROLLER
Cirrus Seven Two Bravo, I don't have any reports of outages. Say intentions.

⑦ PILOT
Cirrus Seven Two Bravo would like vectors for the VOR Alpha approach into Littlebrook.

⑧ APPROACH CONTROLLER
Cirrus Seven Two Bravo fly heading one six zero, vectors VOR Alpha approach at Littlebrook.

⑨ PILOT
Heading one six zero. Seven Two Bravo.

⑩ PILOT
Approach, Cirrus Seven Two Bravo, we're a bit flustered. Could you give us the current weather for Littlebrook?

⑪ APPROACH CONTROLLER
Cirrus Seven Two Bravo, no report for Littlebrook, but Portsmouth is wind calm, visibility one zero, ceiling one thousand overcast, temp two five, dewpoint two one, altimeter three zero zero zero.

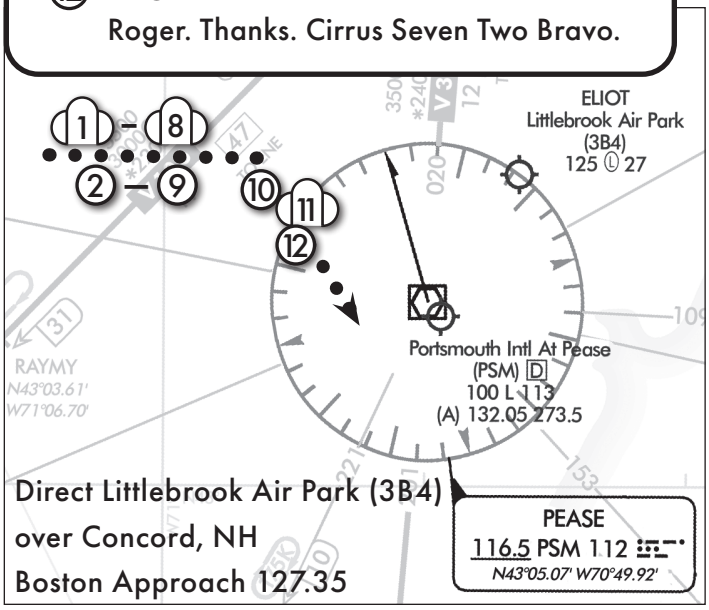
⑫ PILOT
Roger. Thanks. Cirrus Seven Two Bravo.

You and ATC are a team. If something breaks and it affects what you need from ATC, or what ATC might need from you, let them know.

In this case, it affects both of you. You're navigating GPS direct to 3B4, and your system reverts into "Dead Reckoning" mode, with a "GPS NAV LOST" message annunciated. You can no longer fly direct, nor can you accept the RNAV approach.

You must decide what help you need, so if you don't specify, the controller will ask ⑥. It's fine to lean on ATC a bit harder than you otherwise might for assistance, even though this isn't an emergency ⑩.

If you didn't need assistance, loss of any navigation system is still a required report (see "Required Reports When Flying IFR" on page 118). If you report something simply because it's required, you might add that there's "no assistance needed."



Request a No-Gyro Vector to an Approach

① PILOT
Boston Approach, Cirrus Seven Two Bravo, request.

② APPROACH CONTROLLER
Cirrus Seven Two Bravo, Boston Approach. Go ahead with your request.

③ PILOT
Do you have time to give us a practice no-gyro vector to the Hyannis ILS Runway Two Four? Cirrus Seven Two Bravo.

④ APPROACH CONTROLLER
Cirrus Seven Two Bravo, affirmative. You want to do it from your current position?

⑤ PILOT
Affirmative, we're ready now. Cirrus Seven Two Bravo.

⑥ APPROACH CONTROLLER
Cirrus Seven Two Bravo, this will be a no-gyro vector for the ILS Runway Two Four approach. Make standard rate turns. Turn left.

⑦ PILOT
Turn left. Cirrus Seven Two Bravo.

⑧ APPROACH CONTROLLER
Cirrus Seven Two Bravo, stop turn.

⑨ APPROACH CONTROLLER
Cirrus Seven Two Bravo, turn left.

⑩ APPROACH CONTROLLER
Cirrus Seven Two Bravo, stop turn.

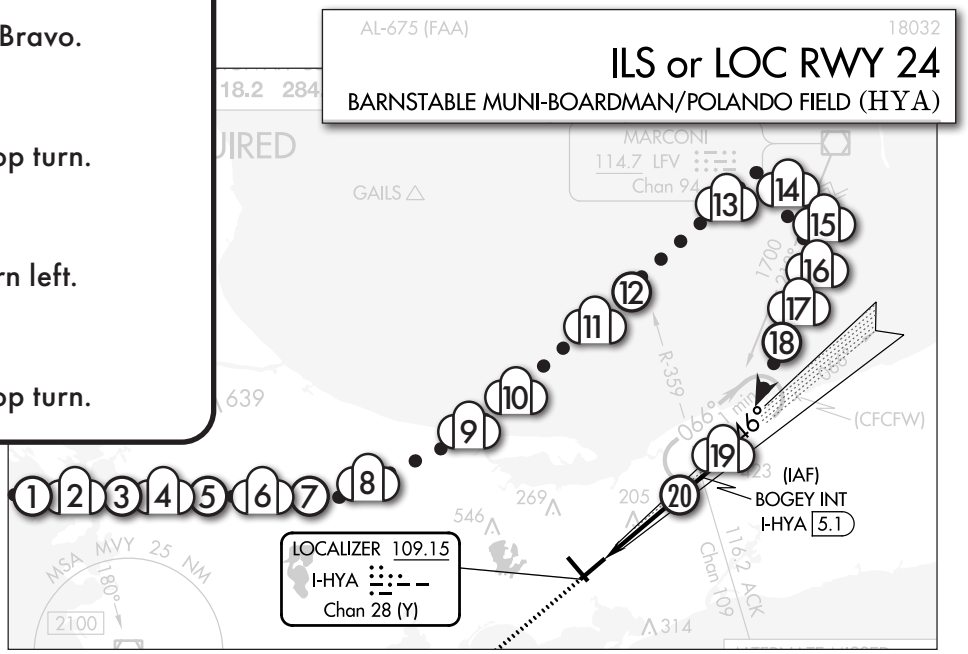
Barnstable Muni. Airport (KHYA)
(which everyone calls "Hyannis")
Hyannis, MA
Boston Approach 118.2

When ATC issues vectors, it's assumed you can fly a reliable heading. If you're flying a simple trainer and lose the vacuum-driven heading and attitude, or your primary flight display (PFD) fails, you could be left without a reliable heading source, not to mention no attitude source. This is a legitimate emergency, so you should declare that to ATC and get help. One tool available is no-gyro vectors.

Instead of giving you headings to fly, the controller watches your target progress across the scope and steers it by saying, "turn [direction]" and "stop turn." You don't need to acknowledge these instructions because the controller is watching you comply on his or her scope. However, if the instruction was combined with other items ⑥, or is for an altitude change or approach clearance ⑪ & ⑰, you should read it back.

No-gyro vectors end with an intercept to the final approach course. You still have to fly this part of the approach on your own with the on-board equipment, although you can certainly ask ATC to keep a close eye on you to catch deviations early.

You may be able to combine no-gyro vectors with a no-gyro version of an ASR approach (page 112). A normal ASR approach has ATC giving you heading corrections all the way to the runway. No-gyro vectors to a no-gyro ASR approach means the controller will continue giving you "turn left ... stop turn" type instructions through the approach itself.



FLYING GPS TRACK INSTEAD OF HEADING

With a panel-mounted GPS, no-gyro vectors may be more trouble than they're worth. Your GPS provides track information, which is your actual path over the ground. Tell ATC you can't fly headings, but can fly tracks. The controller will issue tracks to fly without the wind correction ATC normally adds with headings. Turn until your GPS track is what you want and hold wings level to maintain it.

However, if you have no attitude information and are having trouble just flying partial panel, it's better to have someone else minding your track over the ground while you concentrate on keeping the aircraft upright.

ASR approaches aren't widely available, but you can ask for no-gyro vectors to virtually any airport with sufficient radar coverage. Because there's lag in the radar update, the controller must anticipate the turn of your airplane. Make all turns at standard rate, which is three degrees per second. (If you're getting no-gyro guidance on an ASR approach, make turns at half standard rate on final approach.) The rapid update rate of ADS-B-out transponders give controllers even better visibility of your movements.

Hopefully, you'll never lose heading reference in the clouds, and never have to fly no-gyro vectors for real. That's no reason not to practice, however, so you know what it's like. Controllers have to practice, too, so they're usually happy to accommodate the request ③. Just be sure to say, "Request no-gyro vectors for practice," or "Request a practice no-gyro approach." If you leave out the word "practice," the controller may assume you've experienced an actual instrument failure, and declare an emergency for you.

(11) APPROACH CONTROLLER
Cirrus Seven Two Bravo, descend and maintain one thousand four hundred.

(12) PILOT
Descend and maintain one thousand four hundred. Cirrus Seven Two Bravo.

(13) APPROACH CONTROLLER
Cirrus Seven Two Bravo, turn right.

(14) APPROACH CONTROLLER
Cirrus Seven Two Bravo, stop turn.

(15) APPROACH CONTROLLER
Cirrus Seven Two Bravo, turn right.

(16) APPROACH CONTROLLER
Cirrus Seven Two Bravo, stop turn.

TIP

Unlike ASR approaches with transmission every 15 seconds, you could go for several minutes on a vector without turn instructions. Feel free to request a radio check if you get worried.

(17) APPROACH CONTROLLER
Cirrus Seven Two Bravo is three miles from BOGEY. Maintain one thousand four hundred until established on the localizer, cleared ILS Runway Two Four approach.

(18) PILOT
One thousand four hundred until established, cleared ILS Runway Two Four, Cirrus Seven Two Bravo.

(19) APPROACH CONTROLLER
Cirrus Seven Two Bravo, contact Tower now, one one niner point five.

(20) PILOT
Contact Tower. Cirrus Seven Two Bravo.

Declare Minimum Fuel

(1) APPROACH CONTROLLER
Cirrus Seven Two Bravo, fly heading three four zero, vectors for sequencing. I have several aircraft trying to get into Fargo because of the weather

(2) PILOT
Heading three four zero, Cirrus Seven Two Bravo.

(3) PILOT
Fargo Approach, Cirrus Seven Two Bravo, minimum fuel.

(4) APPROACH CONTROLLER
Cirrus Seven Two Bravo, understand minimum fuel. I don't anticipate a delay getting into Fargo, but there is an area of moderate precipitation two zero miles west of the field moving east. Moorhead is currently reporting twelve hundred overcast and two miles in light rain, if that's an option.

(5) PILOT
Thanks, we'll continue for Fargo for now. Cirrus Seven Two Bravo.

(6) APPROACH CONTROLLER
OK. Keep me apprised.

Direct Fargo and just past PANIC
Fergus Falls, MN
Fargo Approach 120.4

TIP

If you ask yourself the question, "Should I declare an emergency?"—declare an emergency. There's really no downside, and you'll immediately get any attention and priority you need. In the unlikely event you must justify it to the FAA, simply saying you believed it was necessary for completing the flight safely should be enough.

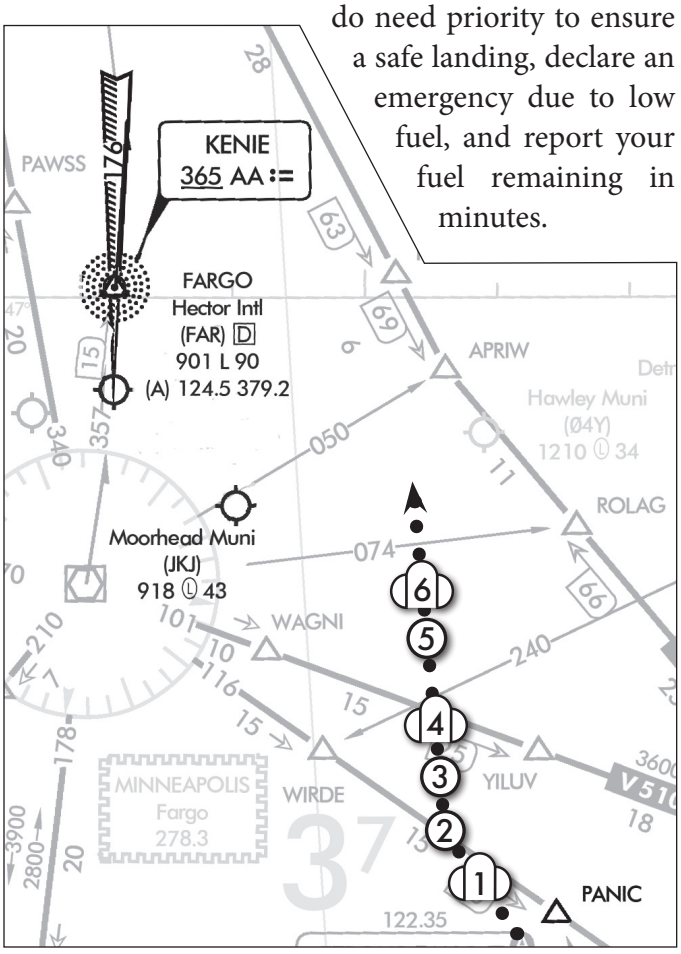
Fuel planning for IFR flight is critical because landing options are more limited and can close down with little warning. Throw in deviations around weather or unforecast headwinds, and the best laid plans can leave you obsessively checking the fuel gauges.

Advising ATC that you have "minimum fuel" is not declaring an emergency. You're just telling the controller that while you have enough fuel to reach your destination, the situation could develop into an emergency if any undue delay occurs between you and the FAF.

The format of the call couldn't be simpler:

[Facility], [Call sign] minimum fuel.

Official sources say that ATC won't give you special handing for minimum fuel. In practice, their response could be anything from keeping an eye on you and offering information that helps you decide how to proceed (4), to declaring an emergency for you whether you like it or not. If you decide that you do need priority to ensure a safe landing, declare an emergency due to low fuel, and report your fuel remaining in minutes.

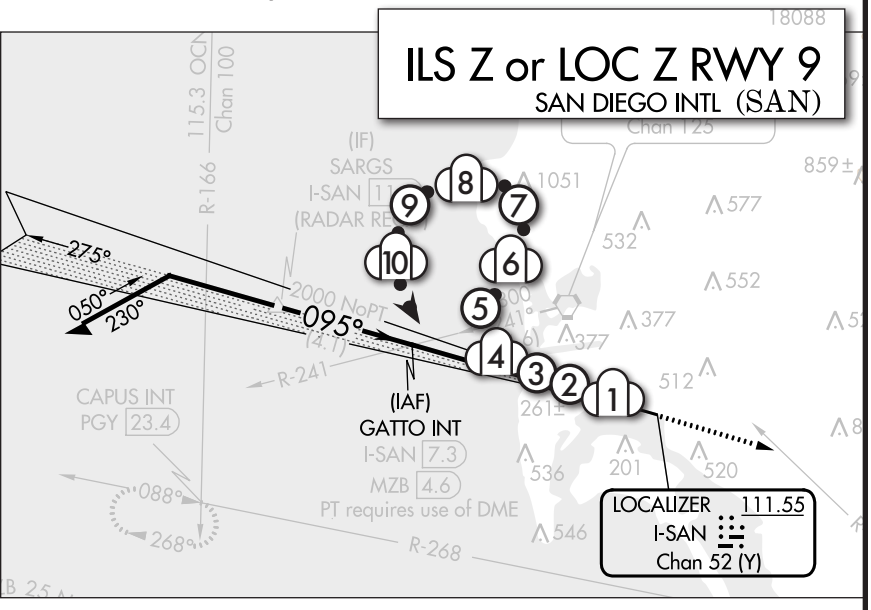


The process for handling true emergencies while in the clouds is really no different than on a sunny day: Declare the emergency and tell ATC exactly what you need.

Perhaps that's the most important thing in terms of communication under IFR. You are no longer requesting things from ATC. "We'd like the ..." becomes "We need the ..." or even "We are doing ..." ⑤. Once you speak the E-word or call out "mayday," you invoke the authority needed.

That said, you're not alone in the clouds. ATC may urgently need you to change your plan to avoid the imminent threat of collision. There are no right answers here, just clear communication, clear thinking, and teamwork. This is why it's essential to have a plan before you launch as to what you're going to do in the event of an emergency, (even if it's simply pulling the airframe parachute, and hoping for the best).

San Diego International Airport (KSAN)
San Diego, CA
Lindbergh Tower 118.3
SoCal Departure 119.6



TIP

A much more likely variation on this scenario would be a non-emergency return, such as if a door opens and can't be closed in flight. When departing in low IFR, have a plan for your return, including loading the approach if possible.

(1) TOWER CONTROLLER
Cirrus Seven Two Bravo, contact Departure, one one niner point six.

(2) PILOT
Contact Departure, Cirrus Seven Two Bravo.

(3) PILOT
SoCal Departure, Cirrus Eight Eight Seven Two Bravo, one thousand three hundred climbing three thousand.

(4) DEPARTURE CONTROLLER
Cirrus Eight Eight Seven Two Bravo, radar contact. Fly heading three three zero, climb and maintain five thousand.

(5) PILOT
Uh ... standby.

(6) DEPARTURE CONTROLLER
Cirrus Seven Two Bravo, SoCal.

(7) PILOT
Mayday, mayday, mayday! Cirrus is returning to San Diego with smoke in the cockpit ... flying the ILS back for Runway Nine.

(8) DEPARTURE CONTROLLER
Cirrus Seven Two Bravo, cleared ILS Runway Niner approach. Contact Lindbergh Tower one one eight point three.

(9) PILOT
Unable. Please tell them we're coming in and need assistance.

(10) DEPARTURE CONTROLLER
Cirrus Seven Two Bravo, Runway Niner, cleared to land. Ground personnel will be standing by.

Request a “Pop-up” IFR clearance

① PILOT
Whidbey Approach, Cirrus Eight Eight Seven Two Bravo, request.

② APPROACH CONTROLLER
Cirrus Eight Eight Seven Two Bravo, Whidbey Approach.

③ PILOT
Cirrus Eight Eight Seven Two Bravo, VFR over Skagit Regional, four thousand five hundred. The weather ahead looks pretty marginal. Request IFR clearance to Olympia.

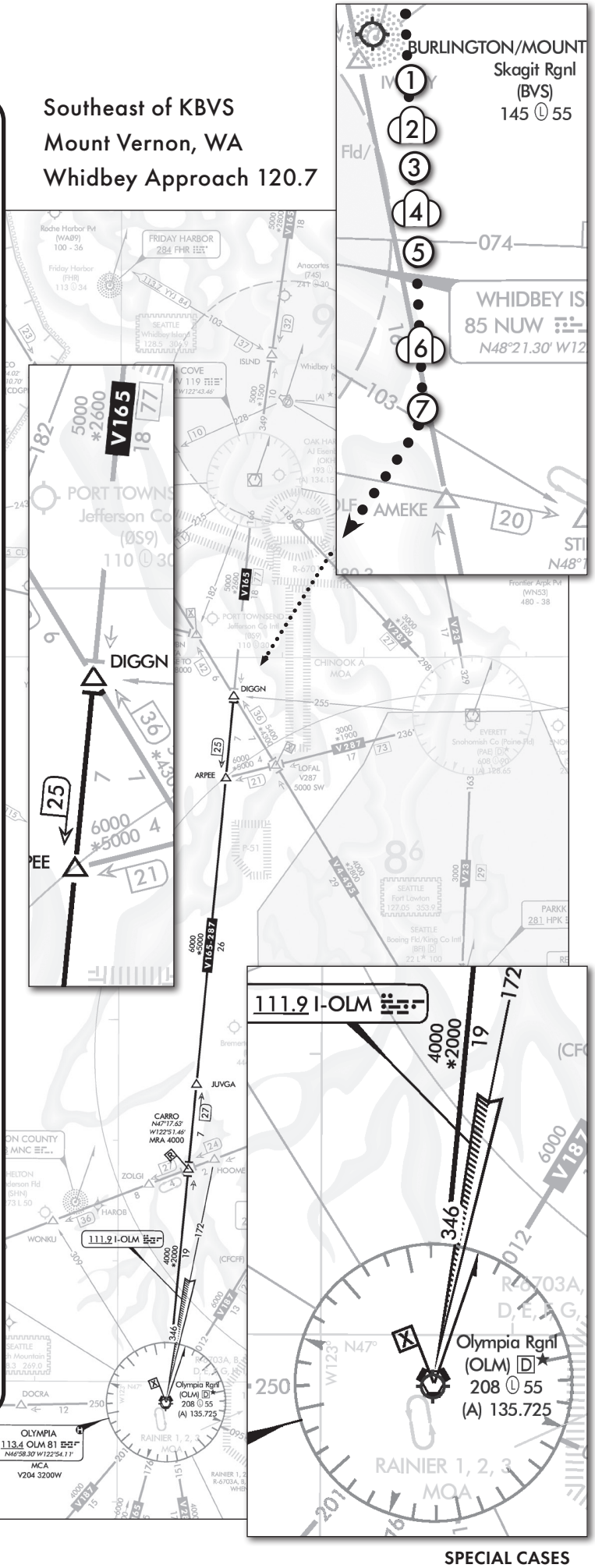
④ APPROACH CONTROLLER
Cirrus Eight Eight Seven Two Bravo, maintain VFR, Whidbey altimeter three zero zero one, squawk zero three six five, and say type aircraft.

⑤ PILOT
Squawk zero three six five, altimeter three zero zero one, and we’re a Cirrus SR22 slant golf, Cirrus Eight Eight Seven Two Bravo.

⑥ APPROACH CONTROLLER
Cirrus Seven Two Bravo, radar contact five miles southeast of Skagit Regional. Cleared to the Olympia Airport via direct DIGGN, Victor One Six Five, Olympia VOR, direct. Climb and maintain six thousand.

⑦ PILOT
Cleared to the Olympia Airport via direct DIGGN, Victor One Six Five, Olympia VOR, direct. Leaving four thousand five hundred for six thousand. Cirrus Seven Two Bravo.

Southeast of KBVS
Mount Vernon, WA
Whidbey Approach 120.7



Sometimes the prospect for a simple, VFR flight looks great during your briefing ... and not so much once you get in the air. Now you need an IFR clearance to your destination. The sure-fire way is filing an IFR flight plan with Flight Service (page 6), and then contacting ATC for a clearance (page 52).

However, you can combine these two steps into one by asking for a clearance directly from ATC, commonly called a "pop-up" clearance. The catch is a pop-up is on a workload permitting basis. This means the closer you are to your IFR destination, the more likely a controller can accommodate you.

The format is two-part. First, get in touch with the right ATC facility (see "Finding the Right Frequency for ATC" on page 53). If you already have flight following, you can skip this step. The call is:

> [Facility], [Call sign], request.

It may take a couple tries to find the right frequency for your location. Don't wait until things get desperate to get in touch with ATC. Part two is:

> [Call sign], VFR, [Position], [Altitude], [Reason for request (optional)], request IFR clearance to [Destination].

Assuming the controller isn't swamped, the ease of a pop-up revolves around airspace. If you just need an instrument approach to an airport in the same airspace as the controller you're talking to, it's a no-brainer. If the destination isn't far, and your current controller only has to coordinate with a neighboring facility (such as in this example) the odds are good. If you try to get a pop-up IFR clearance for hundreds of miles, crossing multiple Class Bs ... expect a referral to Flight Service.

TIP

If you might need a pop-up, but don't want to commit yet, get VFR flight following. You'll get a squawk code and be talking to the right person.

You're IFR the moment the clearance is granted ⑥, and you can enter the clouds. Often, this is granted before ATC asks for information that would be on a regular IFR flight plan: fuel remaining (in time), number of people aboard, and color of aircraft. They don't actually file paperwork; it's recorded for playback in case something happens. With a pop-up that's just an approach to a nearby airport, this step sometimes gets skipped.

Pop-ups also work best when you're already above the controller's minimum altitudes (see "Minimum Vectoring and Instrument Altitude (MVA/MIA)" on page 48). If you're not high enough, you may be asked if you can maintain your own obstruction and terrain clearance to a specified altitude.

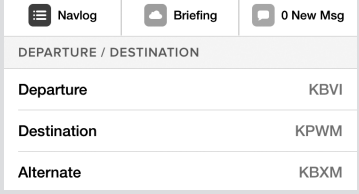
Pop-ups shouldn't be used for the convenience of skipping the proper filing of an IFR flight plan. However, when the weather's deteriorating, you're stuck on top, or you're unexpectedly landing at an airport in busy airspace and want some hand-holding, a pop-up is a safe, legal alternative to scud running.

NOW THAT YOU'RE IFR, NEW RULES APPLY

Getting a pop-up clearance from ATC doesn't obviate your responsibilities per the FARs. This includes the need for a filed alternate airport, unless weather conditions allow otherwise. Given that you requested an IFR clearance to keep flying, odds are you legally need an alternate.

However, ATC can't file that for you. There's no field in the ATC computers for it. That's right, all these years ATC had no idea what your alternate was unless they looked it up elsewhere.

It's possible ATC may send you to FSS to complete your flight plan, especially if it's a long way, but usually this detail is just ignored. It's up to you to comply, or not, and face any consequences. Likewise with other IFR requirements, such as adequate fuel to reach the alternate, fly a complete approach, and then fly for 45 minutes further.



Request an IFR Climb to VFR-On-Top

① PILOT
Torrance Ground, Cirrus Eight Eight Seven Two Bravo, at South Bay Aviation with Delta. Request an IFR climb to VFR-on-Top, preferably eastbound towards Cottonwood, which is Papa Fifty Two, and we're also ready to taxi.

② GROUND CONTROLLER
Cirrus Eight Eight Seven Two Bravo, Torrance Ground. Runway One One Left, taxi via Bravo. Clearance on request.

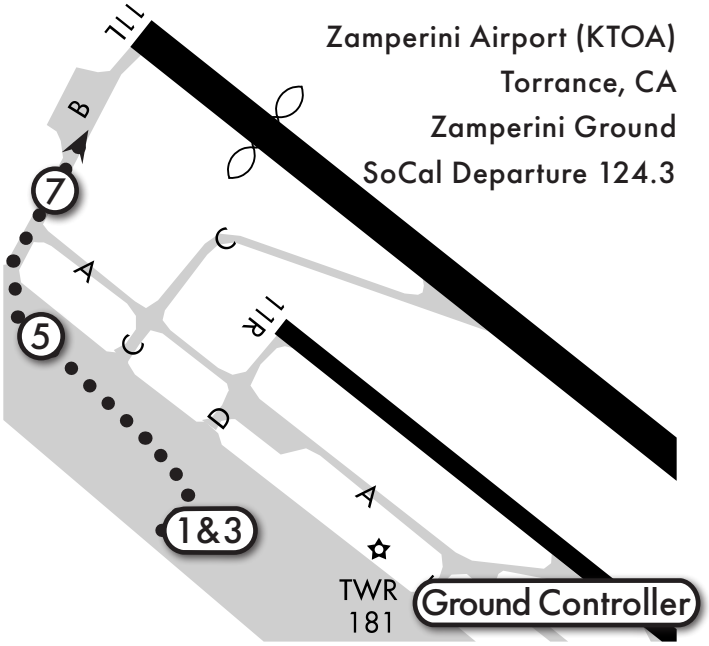
③ PILOT
Runway One One Left via Bravo. Cirrus Eight Eight Seven Two Bravo. Thanks.

④ GROUND CONTROLLER
Cirrus Seven Two Bravo, I have your clearance, advise ready to copy.

⑤ PILOT
Ready to copy. Cirrus Seven Two Bravo.

⑥ GROUND CONTROLLER
Cirrus Eight Eight Seven Two Bravo, cleared to the Seal Beach VOR, via fly runway heading, radar vectors, Seal Beach. Climb to and report reaching VFR-on-top, no tops reports, if not on top at three thousand, maintain three thousand and advise. Departure frequency one two four point three, squawk seven three six one.

⑦ PILOT
Cleared to the Seal Beach VOR, runway heading, vectors, Seal Beach. Climb to and report reaching VFR-on-top. If not on top by three thousand, maintain three thousand and advise. Departure one two four point three, squawk seven three six one. Cirrus Eight Eight Seven Two Bravo.



One way to depart an airport and get above localized clouds, fog, haze, or smoke is to request an IFR climb to VFR-on-top.

The formal way to do this is filing an IFR flight plan to an airport and putting "OTP/[altitude]" in the altitude block. "OTP/45" would mean climb to VFR-on-top with requested altitude of 4500 feet.

You can skip the flight plan and just make the request from Clearance Delivery or Ground ① at a towered airport. Departing a non-towered airport, you could make the request from the Departure or Center controller for the overlying airspace.

The clearance you receive ⑥ will include a clearance limit (your destination, or a fix near the departure airport), and these phrases:

> Climb to and report reaching VFR-on-top. Tops reported [Altitude] (or "No tops reports"). If not on top at [Altitude], maintain [Altitude] and advise.

If you simply report on top in VFR conditions, ATC will tell you to "Maintain VFR-on-top." This is

TIP

If the weather allows for a visual climb VFR, but with only one mile visibility and clear of clouds, you can ask for a Special VFR climb to VFR. This is not an IFR clearance, and may be quicker.

⑧ GROUND CONTROLLER
Cirrus Eight Eight Seven Two Bravo, readback correct.

After taxiing out, taking off, and getting handed to Departure ...

⑨ PILOT (on 124.3)
SoCal Departure, Cirrus Eight Eight Seven Two Bravo, one thousand one hundred climbing three thousand.

⑩ DEPARTURE CONTROLLER
Cirrus Eight Eight Seven Two Bravo, radar contact. Turn left heading zero seven zero. Report reaching VFR-on-top.

⑪ PILOT
Left zero seven zero. Report VFR-on-top, Cirrus Eight Eight Seven Two Bravo.

⑫ PILOT
SoCal Departure, Cirrus Eight Eight Seven Two Bravo is in VFR conditions on top. We'd like to cancel IFR, but stay with you for advisories to Cottonwood.

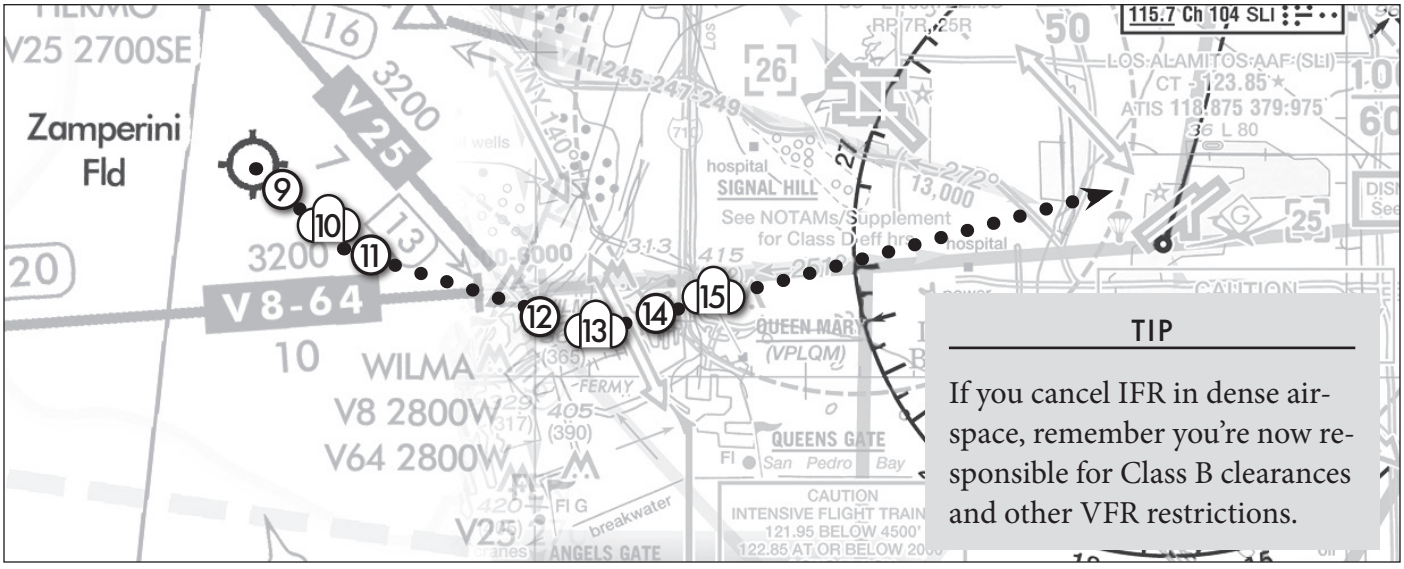
⑬ DEPARTURE CONTROLLER
Cirrus Seven Two Bravo, roger. IFR cancellation received. Say destination again, and on-course heading and altitude.

⑭ PILOT
Destination is Cottonwood, Papa Fifty Two, heading zero seven zero at five thousand five hundred. Cirrus Seven Two Bravo.

⑮ DEPARTURE CONTROLLER
Cirrus Seven Two Bravo, roger. Keep your current squawk code. Maintain VFR. Enjoy your flight.

an IFR altitude (page 59). Because you're on an IFR flight plan, you have a clearance limit, and it probably isn't an airport where you could fly an approach and land. That might be fine if you were just climbing above the clouds for maneuvers or sight seeing. If you actually plan to go somewhere, you'll probably cancel IFR ⑫ and continue the flight VFR.

Of course, if you reach the "if not on top" altitude in your clearance and you're still IMC, you'll be asked what your intentions are. Any time you depart on an IFR climb to VFR-on-top, you'd best have a plan for what you'll do if you can't reach visual conditions. Eventually, you do have to come back down.



TIP

If you cancel IFR in dense airspace, remember you're now responsible for Class B clearances and other VFR restrictions.

Request an Approach to One Airport So You Can Land at Another

(1) APPROACH CONTROLLER
Cirrus Seven Two Bravo, say approach request at Kingston?

(2) PILOT
We'd like vectors for the RNAV Runway Three Three. Be advised, we're hoping to cancel near BFINE and proceed VFR to Sky Park. Cirrus Seven Two Bravo.

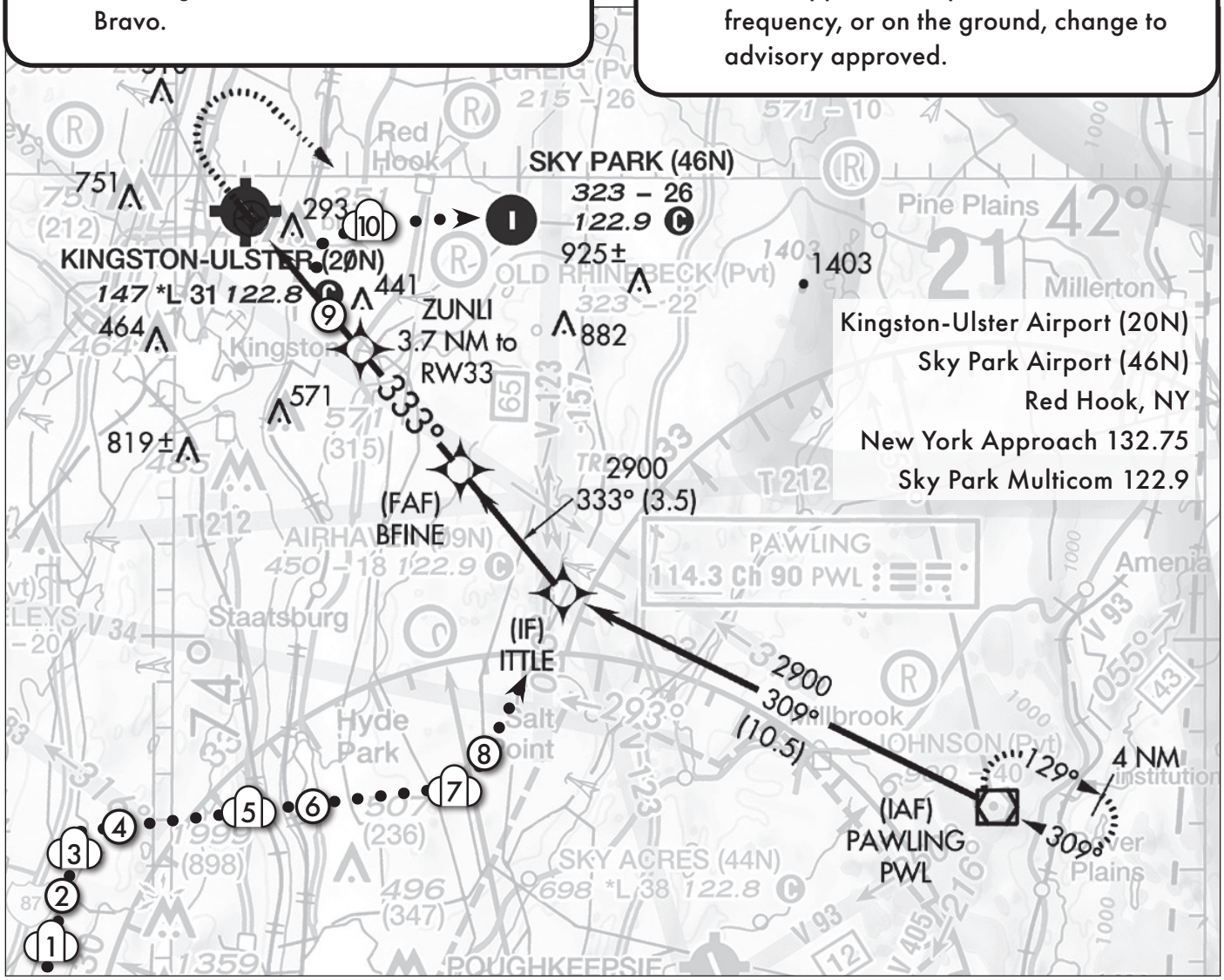
(3) APPROACH CONTROLLER
Cirrus Seven Two Bravo, roger. Fly heading zero six zero, vectors RNAV Runway Three Three at Kingston.

(4) PILOT
Heading zero six zero. Cirrus Seven Two Bravo.

(5) APPROACH CONTROLLER
Cirrus Seven Two Bravo, descend and maintain three thousand. Kingston altimeter two niner niner niner. Verify you have the Sky Park weather?

(6) PILOT
Leaving five thousand for three thousand, two niner niner niner, and we have the weather from Kingston. Closest we can get. Cirrus Seven Two Bravo.

(7) APPROACH CONTROLLER
Cirrus Seven Two Bravo, proceed direct ITTLE, cross ITTLE at or above three thousand, cleared RNAV Runway Three Three approach. Report cancellation this frequency, or on the ground, change to advisory approved.



COMBINING IFR AND VFR TO YOUR ADVANTAGE, BUT NOT YOUR DEMISE

Flying under IFR grants the enormous privilege of flight through the clouds. Flying IFR ensures the safety of guaranteed obstacle clearance. Flying IFR removes concerns about accidentally blundering into the wrong airspace.

However, IFR imposes big penalties in complexity and procedures. You can only fly where ATC allows and at altitudes much higher than you could VFR. Savvy pilots weigh these factors against each other and select the flight rules that offer the best advantage in the moment. Techniques such as VFR-on-top altitudes (page 59) and contact approaches (page 100) let you combine the best of both worlds, but sometimes a flight needs to change flight rules in the air to make things work. Changing from VFR to IFR on the fly (page 124) bolsters safety. Going the other way, as shown here, can eradicate it.

Before you pull the plug on IFR, ask yourself how you'll handle losing what IFR ensures. You can use the acronym "AOG" for "airspace, obstacles, guidance." How will you stay legal for airspace? How will you avoid obstacles and terrain? How will you guide yourself to the destination in terms of both navigation and visibility?

It's perfectly legal to file IFR to an airport that has no instrument approach. In lieu of an approach, you ask for a descent to the MEA, or controller's MVA, to reach visual conditions to cancel IFR, and finish the flight under VFR (see sidebar above). You must file an alternate airport with a published instrument approach for this to be legal.

A variation on this theme is filing IFR to an airport with an approach near your destination, and using that approach to get down below the clouds. This is legal, and can be safe, provided you exercise the privilege with care. You'll be "scud-running" to the real destination, so the closer you can get while still IFR the better. The ideal situation is a final approach to Airport A that passes right over Airport B (your real destination). This means you may have to ask for a lesser used approach, or one against the prevailing winds. You should also let the controller know your plan ②, otherwise they expect you to land at the destination, and may get quite concerned if they see you veer off course.

⑧ PILOT
Direct ITTLE, cross ITTLE at or above three thousand, cleared for the approach, we'll monitor CTAF but stay with you to try and cancel after BFINE. Cirrus Seven Two Bravo.

⑨ PILOT
New York Approach, Cirrus Seven Two Bravo. Cancel IFR.

⑩ APPROACH CONTROLLER
Cirrus Seven Two Bravo, IFR cancellation received, squawk VFR, frequency change approved.

There's one essential communication catch with this technique: You *must* cancel IFR *before* you break off to the other airport VFR. It's a bit of regulatory gray zone whether you must hear that the cancellation was received before you proceed VFR. If you don't hear it clearly, get in touch with ATC as soon as you land. At least you warned them in advance.

You must have VFR weather minimums to cancel IFR. That's why this works best with an approach at a non-towered airport that lets you divert in Class G airspace. Your IFR flight plan would automatically cancel at a towered airport, but the weather would have to be good enough for you to depart the Class D VFR. If it wasn't, you'd have to arrange a Special VFR clearance with Tower as you flew the approach.

Request a Through Clearance

① PILOT
Tri-City Approach, Cirrus Eight Eight Seven Two Bravo, level seven thousand with current weather for Johnson City.

② APPROACH CONTROLLER
Cirrus Seven Two Bravo, Tri-City Approach. Say approach request at Johnson City.

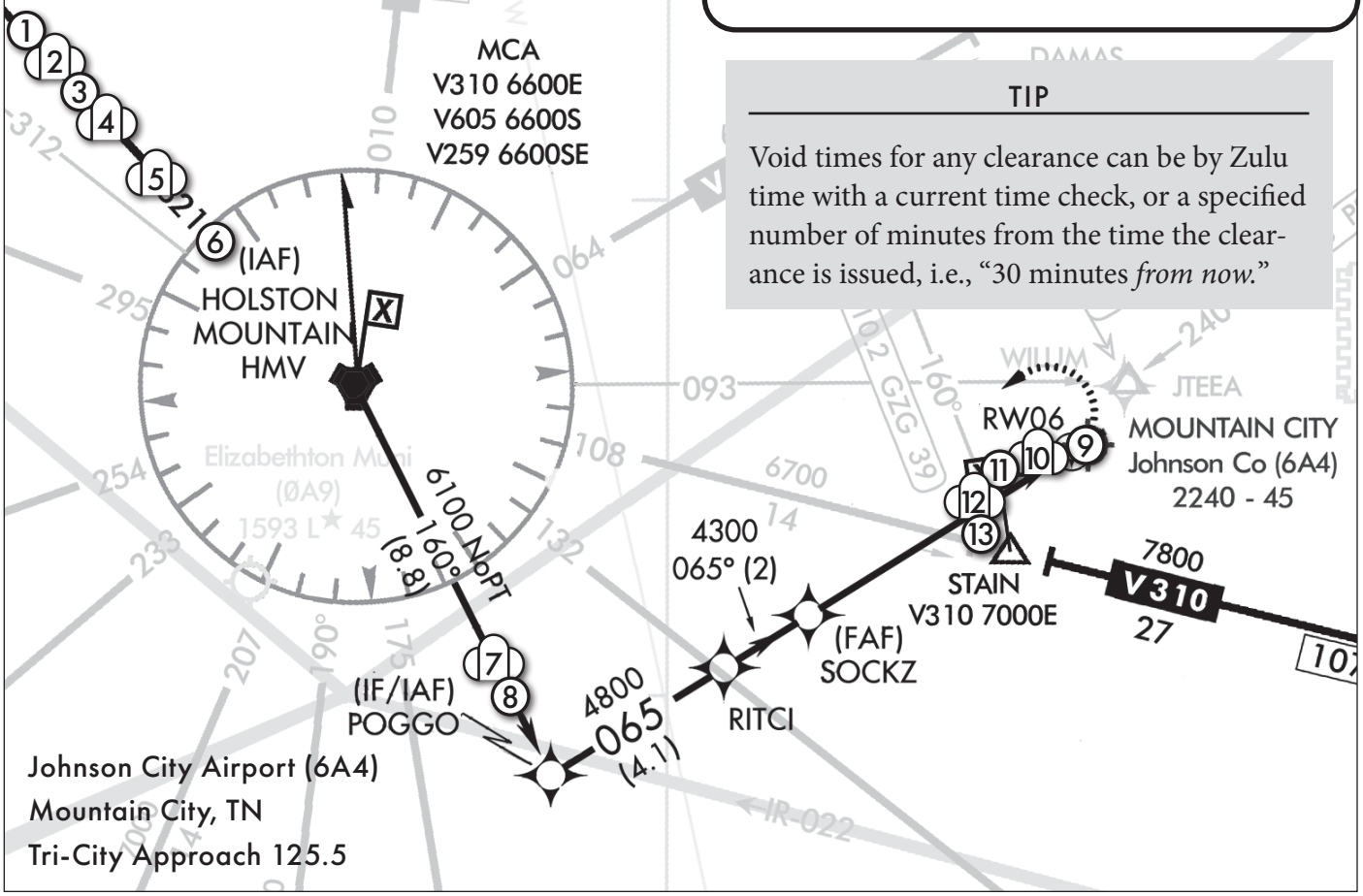
③ PILOT
We have a flight plan on file to Billy Mitchell Airport, and request a clearance through Johnson City to Billy Mitchell. We'll be on the ground at Johnson County for one five minutes. We'll be departing Runway Two Four. Cirrus Seven Two Bravo.

④ APPROACH CONTROLLER
Cirrus Seven Two Bravo ... uh, standby.

After the controller looks up what a "through clearance" is, and retrieves your flight plan:

⑤ APPROACH CONTROLLER
Cirrus Seven Two Bravo is cleared through the Johnson County Airport to the Hotel Sierra Echo Airport via STAIN, Victor Three Ten, Tar River, Victor Two Ninety, PUNGO, direct. Maintain niner thousand. Squawk three zero two five. Void if not off in thirty minutes. If not off in thirty minutes, advise Tri-Cities Approach of intentions.

⑥ PILOT
Cleared through the Johnson County Airport to the Hotel Sierra Echo Airport via STAIN, Victor Three Ten, Tar River, Victor Two Ninety, PUNGO, direct. Maintain niner thousand. Squawk three zero two five. Void if not off in thirty minutes. Cirrus Seven Two Bravo.



TIP

Void times for any clearance can be by Zulu time with a current time check, or a specified number of minutes from the time the clearance is issued, i.e., "30 minutes *from now.*"

The "through clearance" is an IFR clearance that lets you make a quick stop at a non-towered airport on the way to your destination. Similar to hearing a simple "Cleared approach" or a cruise clearance, the through clearance lets you fly any approach into the through airport, including a visual or contact approach. You land, spend a short time on the ground, and depart—all without closing your IFR flight plan and getting a new IFR clearance and release.

You can't file for a through clearance. Instead, you file two IFR flight plans, and then connect them with a through clearance you get from ATC after you're airborne.

Suppose you were headed from Blue Grass Airport (KLEX) to Johnson County Airport (6A4) to pick up a friend. The two of you will continue east to Billy Mitchell Airport (KHSE) on Cape Hatteras. Because you're already talking to the ATC facility who would give you an IFR departure clearance from 6A4, you short-cut the procedure by requesting a through clearance to KHSE ③.

You'll only get a through clearance at low-traffic airports (or in the middle of the night) because the airspace is blocked to all other aircraft. In fact, nearby airports may be blocked as well to protect your departure route, so the stop must be short. You can't get a through clearance at a towered airport. There would be no point.

Back in the day, through clearances were popular with freight dogs, check haulers, and helicopters servicing oil rigs on the Gulf Coast who would land, drop off or pick up some cargo, and get flying again ASAP. Through clearances are rare these days, and few pilots—or controllers—have any experience with them.

That said, they're useful if you need to make a quick stop at a non-towered airport to drop off or pick up a passenger or some cargo, to quickly get some fuel, or to run (perhaps literally) to a restroom. Another use is a stop at a really remote airport that has no RCO or cell tower within range, and no landline on the field. Getting a through clearance may be the easiest way to legally get back into the IFR environment if the weather is low IFR. Just remember you're still responsible for flying any departure procedure needed to climb out safely.

(7) APPROACH CONTROLLER
Cirrus Seven Two Bravo. Change to advisory approved. See you in a few.

⑧ PILOT
Over to advisory. Talk to you soon. Cirrus Seven Two Bravo.

After flying the RNAV (GPS) Runway 6 approach from HMV, landing, picking up the passenger, and departing Runway 24:

⑨ PILOT
Tri-City Approach, Cirrus Eight Eight Seven Two Bravo, off Johnson City Airport, four thousand niner hundred climbing niner thousand.

(10) APPROACH CONTROLLER
Cirrus Eight Eight Seven Two Bravo, ident. Johnson County altimeter two eight eight seven.

⑪ PILOT
Ident and two eight eight seven. Cirrus Seven Two Bravo.

(12) APPROACH CONTROLLER
Cirrus Seven Two Bravo, radar contact three miles south of Johnson City. Proceed direct STAIN

⑬ PILOT
Direct STAIN. Cirrus Seven Two Bravo.

TIP

You can request a through clearance for an unplanned stop part way through an IFR flight, such as if "nature calls" and you're passing over an airport with "facilities." Your route would become, "... cleared through [airport] to [destination] remainder of clearance remains unchanged ..." plus, uh, "void" times and other instructions.

EVER HEAR A CONTROLLER MENTION A "FLIGHT STRIP"?

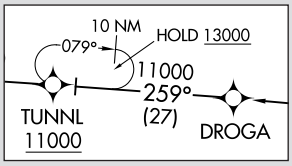
A primary tool ATC uses for monitoring and controlling aircraft during an IFR flight is still the flight progress strip. Whether a flight strip is printed on paper (yes there are still real paper strips) or displayed on a touchscreen, controllers use the strips to reference your flight plan, annotate details about your flight, keep a record of the instructions you've been issued, and to organize their thoughts as they control and sequence multiple aircraft. The term "handoff" comes from the fact that back in the day, controllers would physically hand a strip to the next controller.

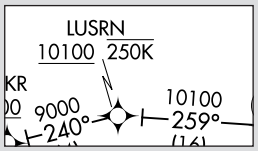
N8872B SR22/G	4522	KOAK	KOAK SAC KAUN			
	P2035					
824	70					

On this departure strip, you see the aircraft's registration or flight number (N8872B), the aircraft type (SR22/G), a unique computer I.D. number (824), assigned squawk code (4522), proposed Zulu departure time (2035), requested altitude in hundreds of feet (70), departure airport, route, and destination airport. Other information is included or added as necessary. Center and Approach are similar with slightly different layouts.

ALTITUDE/SPEED RESTRICTIONS

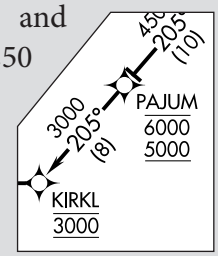
Cross TUNNL at or above 11,000 (but you would expect to hold at or above 13,000.)





Cross LUSRN at or above 10,100 and under 250 knots.

Cross PAJUM between 6000 and 5000, but cross KIRKL at exactly 3000.



FINDING PROPER PHRASEOLOGY?

The Aeronautical Information Manual (AIM) is the definitive source for pilots concerning communication (see Section 2 on "Radio Communications Phraseology and Techniques.)"

If you're really motivated, and want to see it from the controller perspective, search online for the current version of JO 7110.65, a.k.a. the "controller bible." Almost every section includes example phraseology.

Both publications include the same "Pilot/Controller Glossary" in the back.

ALL THOSE ALTIMETER SETTINGS YOU GET FROM ATC

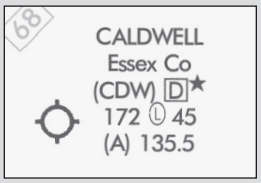
IFR in the U.S. above 17,999 feet makes setting the altimeter easy: 29.92. This doesn't correct for changes in air pressure, so an assigned altitude of 20,000 feet is called "Flight Level 200."

Below the Flight Levels, Center provides the altimeter setting for the nearest reporting station along your route of flight, at least one time while in each controller's sector. If your destination isn't served by an approach facility, ATC gives the destination setting as you get close. Approach controllers provide altimeter settings on departure from a non-towered airport, and on arrival to all airports.

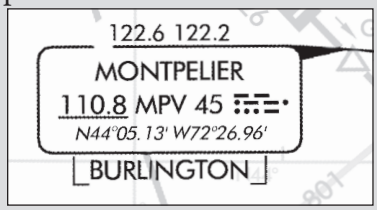
Approach minimums are predicated on a local altimeter setting, which you should verify. ASOS/AWOS altimeter settings update every minute, and a special observation ATIS is issued if there's a significant change, but datalink weather is only as accurate as its last update time.

FINDING FREQUENCIES ON THE CHARTS

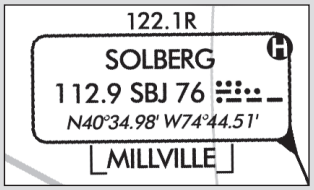
IFR Enroute Low Altitude Charts

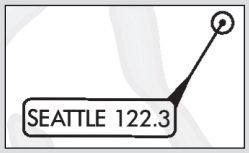


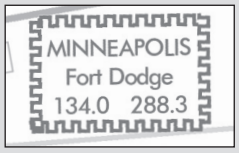
ATIS frequencies are shown with an "(A)" in the airport data blocks on Enroute Low Altitude Charts. A star by the frequency (or by the "D" for a Class D tower) means part-time operations. Check the Chart Supplement for times.



RCO frequencies for FSS appear above NAVAID boxes ("R" or "T" indicates receive- or transmit-only). An inverse "H" indicates Hazardous In-Flight Weather Advisory Service (HIWAS) is broadcast over the VOR frequency. Frequencies for stand-alone RCOs (sometimes co-located with airports) are shown in their own boxes. Remote sites for Air Route Traffic Control Centers (ARTCCs) with discrete frequencies are shown in blue boxes (with the site name below the ARTCC name).







Instrument Approach Procedure (IAP) charts

ATIS	CHICAGO APP CON	AURORA TOWER★	GND CON	CLNC DEL	UNICOM
125.85	133.5 349.0	120.6 (CTAF) L	121.7	121.7 (When tower closed)	122.95 123.5

The briefing strip on IAP charts lists frequencies left to right in the order you'd use them on arrival. A tower frequency is in a heavy-line box. Part-time operations are indicated with a star.

Airport, (SID/DP), and (STAR) Charts

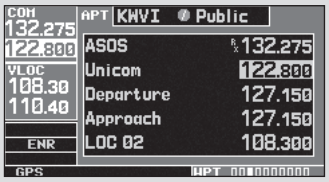
Frequencies appear in the upper left or right corner of Airport Diagram, SID or other DP, and STAR charts. Part-time operations are indicated with a star.

Chart Supplement (formerly called the A/FD)

The "Communications" section of an airport's listing in the Chart Supplement includes all the frequencies for facilities serving that airport.

AIRPORT MANAGER: 803-329-5560
WEATHER DATA SOURCES: ASOS 120.775 (803) 981–9388.
COMMUNICATIONS: CTAF/UNICOM 123.05
Ⓡ **CHARLOTTE APP/DEP CON** 120.05
CLNC DEL 126.85

Digital Devices



The above sources notwithstanding, the easiest way to find frequencies is probably your panel-mounted avionics or your tablet. In fact, retrieving frequencies from digital flight plans and databases, as well as loading them into radios (sometimes automatically), is so much a part of instrument flying today that it's worthy of its own book on procedures.

If you're just flight planning, websites like SkyVector and AirNav are great sources.

Still can't find the frequency and you're in the air? Radio FSS or ATC, and ask (assuming you can find those frequencies).

WHO YA GONNA CALL?

Who You're Calling	How to Address Them
Clearance Delivery	"Burbank Clearance"
Ground Control	"Burbank Ground"
Control Tower	"Burbank Tower"
Departure Control	"SoCal Departure"
Approach Control	"SoCal Approach"
ARTCC	"Los Angeles Center"
Flight Service Station	"San Diego Radio"

PilotWorkshops is dedicated to proficiency training for general aviation pilots. Details and samples of our many products, including the companion *VFR Communications: A Pilot-Friendly Manual*, are available at www.PilotWorkshop.com.

When you visit, be sure to sign up for the free *Pilot's Tip of the Week* (if you don't already subscribe). These are short, focused, and practical tips you can take directly to the cockpit. Developed by our team of nationally recognized instructors, the tips are enjoyed by over 200,000 fellow pilots.