



Single-Pilot IFR

Single-pilot IFR can be as safe as you choose to make it, and there are many things you can do to make it safer.

Introduction

Is it safe to fly IFR as a single pilot? While most pilots agree that an experienced and competent copilot enhances the safety of IFR flight, thousands of single-pilot IFR (SPIFR) trips are completed safely every day.

For pilots, two better questions are “How safe is it?” and “Can I do it safely myself?”

Unfortunately, there are no “one-size-fits-all” answers. Finding the correct answer for yourself requires more questions, such as “How safe do I want it to be? How much effort and money am I willing to invest? How much flexibility do I have in my transportation schedule?” This Safety Advisor explores the human and equipment variables that go into the single-pilot IFR (SPIFR) equation.

The AOPA Air Safety Foundation's accident database, which contains nearly 50,000 general aviation accident reports, reveals that SPIFR flights suffer several times more accidents operations flown with two pilots. Since most general aviation IFR operations are flown single pilot, exposure alone explains much of the difference in the number of accidents. Additionally, most two-pilot operations are flown in larger turbine powered aircraft, which operate in a different environment and typically have more extensive equipment than light GA aircraft. Nonetheless, SPIFR operations warrants special attention.

No type of flying requires greater skill or longer periods of concentration than SPIFR. Near perfect performance is the minimum standard, and that standard takes a commitment from the pilot.

What's the Problem?

Very simply, the problem is pilot workload, aggravated by the need for multi-tasking. A single IFR pilot also serves as navigator, radio operator, systems manager, onboard meteorologist, record keeper, and sometimes, flight attendant. En route flight in benign weather is usually not too stressful, but add high-density traffic in poor weather conditions or a significant equipment malfunction, and overload may not be far away.

Some pilots pride themselves on how many balls they can juggle at one time. However, studies have shown that once we start juggling more than three to five tasks, depending on the individual, accuracy and effectiveness deteriorate rapidly—very much like a computer with too many programs running simultaneously. Overloaded computers lead to computer crashes and overloaded humans can lead to aircraft crashes.

Practice multi-tasking and setting priorities. If you try to do everything at once, the bad results will speak for themselves. Practice will speed up your response to routine

items. If you can't handle basics, you won't be able to handle multiple tasks well. Learn to recognize when overload is starting to occur; that's the time to reassess priorities. This may mean asking for a delaying vector, telling ATC to stand by, slowing the aircraft down, or using a VOR to get to a nearby fix rather than programming that fix and inserting into the GPS flight plan.

Distraction is one of the leading causes of blown clearances, incidents and accidents. It means the pilot is not focused on the most important thing at the time. It can be as simple as arrival at a fix without having planned the subsequent action, or as complex as having an engine fail at localizer intercept. Most people can handle two tasks, but three or more? The ability to react and regain control is one measure of a good instrument pilot.

Before Flight

So, what can you do to assure peak performance as the single pilot of an IFR flight?

IFR flight, even before takeoff, can cause a heavy workload, especially if there is complex weather. Any surprise or distraction can start to wrest control from a pilot, and a second or third problem arriving at the same time can rapidly escalate to an out-of-control situation.

Preparation keeps problems from compounding when the unexpected happens. With computerized flight planning, online airport directories, and literally dozens of sources of weather, thorough preparation should be easy. There is so much data, however, that sorting and making sense of it all can be challenging, more so for new IFR pilots or those who don't fly in instrument meteorological conditions very often.

We offer two suggestions: Get an experienced IFR pilot (not necessarily an instructor) to walk you through the planning process. Take notes so you remember how it's done. Secondly, plan a trip at least once a week for several weeks,



Beat the rush! Any programming you can do on the ground frees up time in flight for other tasks.

right up to the point of filing the flight plan. This is a great way to practice getting weather, looking at NOTAMs, selecting alternates, determining fuel reserves, reviewing approach charts, etc.

Get your IFR clearance, and load the navigation radios or the GPS flight plan before leaving the parking area. You learned this in primary IFR training, but it is one of the keys to good SPIFR. The pros do it this way so that when they get to the run-up pad it takes just a minute or so for the final before-takeoff check, and it doesn't hold up aircraft behind them. Feeling rushed on the run-up pad is a prime cause of mistakes.

If the aircraft has a ground power switch, so much the better. You'll save 10 minutes of engine time if you can obtain ATIS, get an en route clearance and program the GPS prior to engine start. Pilots flying airplanes without a ground power switch often carry a hand-held aviation transceiver for the express purpose of listening to ATIS and getting an IFR clearance, all before starting the engine, which also starts the Hobbs meter.

Equipment—How Much is Enough?

Let's take the airplane first. Is the equipment right for the job? Light IMC—say, an 800-foot overcast and three miles visibility, with reasonably smooth air in a low density area shouldn't be too challenging if you are familiar with the aircraft. But think ahead. Suppose a crucial piece of equipment, perhaps the vacuum pump, fails on this flight? Have you recently practiced controlling the aircraft on partial panel (without the artificial horizon and directional gyro?) One way to minimize the chance you'll have an in-flight emergency is to make sure all the maintenance and inspection requirements for the aircraft and its accessories are up to date. If you own the aircraft, that should be easy; pilots who rent aircraft, however, typically put faith in the FBO's maintenance practices.

Where there's a choice, renters should look for an FBO willing to put a little extra into its IFR airplanes, both in equipment and maintenance. There is nothing worse than launching into instrument conditions with poor quality equipment that doesn't work or doesn't work well. A panel with equipment that would be acceptable for low density VFR operations may be completely inappropriate for the IFR environment. If it doesn't work, turn it back in!

One more caution: if the rental aircraft is new to you, and you're not yet comfortable with this particular type of airplane or its avionics suite, don't gamble on an IFR flight—get dual instruction!

Today, minimum IFR equipment is usually considered to be dual nav/coms, an audio panel with marker beacon receiver, and a transponder with Mode C. Many pilots would add

at least a yoke-mounted GPS as a supplement to the approved IFR equipment. (No yoke-mounted GPS unit is approved for use as a primary navigation unit for any required IFR GPS or DME functions.) Here are some other items that can greatly reduce your workload and are highly recommended for SPIFR:



More is not necessarily better when it comes to flight gear and pilot accessories.

1. High quality navigation and communication radios—They have to work well—no excuses.

2. Headset and push-to-talk switch—missed radio calls and poor quality radio transmissions hamper the pilot's ability to communicate effectively, which raises both pilot and ATC workload when transmissions have to be repeated. The ability to talk without reaching for a hand microphone eliminates a major distraction, and a headset provides clearer audio reception, minimizing missed or misunderstood transmissions. Invest in the best quality equipment you can afford. Active noise canceling headsets are expensive but worth every penny if you plan to do much IFR flying.

3. An autopilot slaved to a heading bug is invaluable for keeping the airplane right side up and going in the proper direction while the pilot reads charts, copies revised clear-



Although not legal for navigation under IFR, a hand-held or yoke-mounted GPS receiver can be useful in maintaining situational awareness.

ances, tunes radios, etc. Altitude-hold and coupling features are wonderful added benefits, but even a basic wing leveler is much better than nothing. Fatigue is very much a consideration in SPIFR. Long flights in tough weather where the pilot must not only manage the system and hand fly the aircraft raises the risk level. Single-pilot charter flights are required by the regulations to have a fully functional autopilot for IFR dispatch. While it's not required for personal flights under FAR Part 91, it's a very good idea.

4. GPS or Distance Measuring Equipment (DME)—Some means of measuring distance is useful for maintaining situational awareness. Until recently, DME was the standard for measuring horizontal distance, even though it could only measure from VORTACs or VOR-DME stations. Today, GPS has largely taken over DME functions. A word of caution on GPS receivers: Unless you thoroughly understand how to program the unit, errors are virtually certain. Some GPS units (especially panel-mount units) are so complex that they become major distractions in themselves. The more capable GPS receivers that incorporate nav/com and transponder functions require ground training before even VFR flight. Consider online or DVD tutorials to gain a basic understanding of a particular unit. Remember, handheld GPS may be used for supplemental data only.

5. A hand-held communications radio and a handheld GPS—it only takes one complete electrical failure in IMC to fully appreciate the value of this equipment. A hand-held com radio can help you obtain clearances before engine start, save fuel when experiencing ATC ground delays, get weather reports, and listen to ATIS/AWOS on your way to the airport. Hand-held transceivers with only “rubber duck-

ie” antennas have extremely limited range; connecting the transceiver to the aircraft antenna system with a BNC connector will dramatically improve your chances of communicating with ATC in an emergency. (Although an avionics technician must install the connection, it's a worthwhile investment for any aircraft owner.) Renters who regularly fly the same IFR aircraft may be able to negotiate such an installation with the FBO.

6. Backup power for flight instruments—Losing primary flight instruments in IMC is a major emergency. While the FARs require proficiency on partial panel for certification and for instrument proficiency checks, the accident record shows that quite a number of pilots aren't able to handle it. In airliners and business jets, there is triple redundancy in this area. Our strong recommendation is that any aircraft regularly flown IFR should have dual vacuum pumps, an alternate power system, or instruments capable of functioning independently from the primary power source.

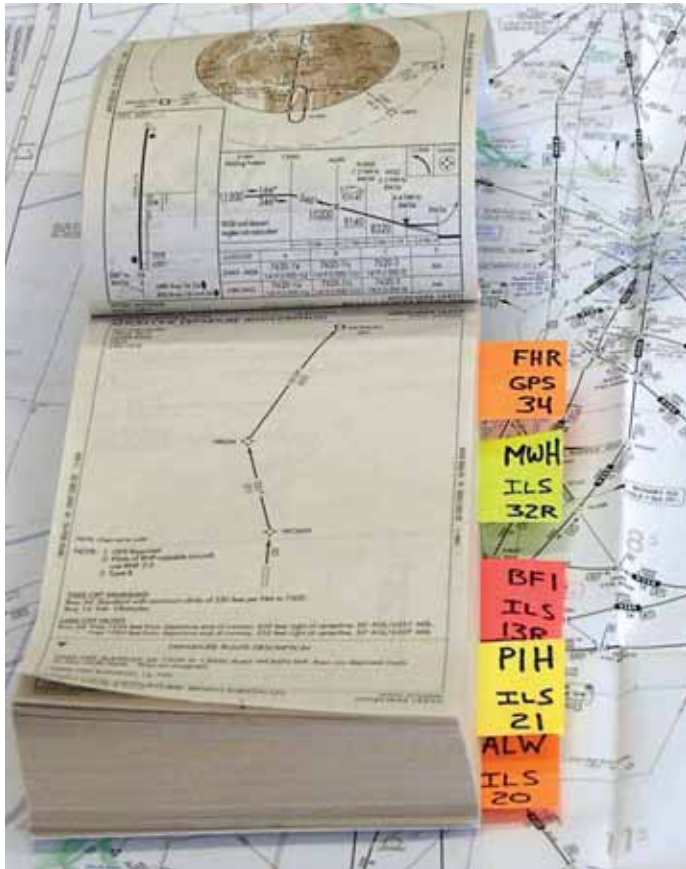
Pilots with an unlimited budget might want to add electric trim, an HSI, a flight director, an altitude preselect and alerter on the autopilot, a collision avoidance system, weather datalink for weather radar images and reports beamed directly to the cockpit, a WAAS-enabled GPS and more. Most pilots enjoy gadgets, and these can contribute to easing the workload while providing more information and avoiding distractions.

Pilots with lavishly equipped cockpits may be objects of envy around the airport, but the ability to load an airplane with electronic goodies won't automatically decrease workload or enhance safety. Better to be competent in the essential equipment than confused and intimidated by sophisticated but poorly understood paraphernalia.

Organization

The easiest way to make single-pilot IFR simpler is through advance planning and organization—remember the “before flight” discussion earlier? This means having a cockpit so neat and tidy that your mother would be proud of you. Pre-select every chart and publication needed, put them in the order of expected use and have them open, folded, or tabbed as appropriate.

- With government approach chart booklets a Post-It® tab or sticker is a great way to get right to the chart needed.
- With Jeppesen charts, pull departure, arrival and alternate charts out of the main binder and put them into a small trip book – it's much easier to handle.



Tab your charts for easy retrieval.

- Use Post-It® tabs or stickers on the en route charts to highlight key waypoints, intersections or VORs along the way. Your IFR chart isn't permanently marked for the next trip and when that invariable change to the flight plan occurs, simply reposition the waypoint stickers. Put charts away when finished.
- Many pilots use white spaces on low altitude en route IFR charts for jotting down clearances, new frequencies, and the like. For one thing, it keeps information close to the portion of the chart relevant to that clearance or frequency. For another, clearances to the same destination are often the same, trip after trip. For most non-professional IFR pilots, the 56-day revision cycle for en route charts provides a fresh writing surface before the jottings start obscuring printed data on the old chart.
- Have several pencils/pens and some paper handy; Post-It® notes are also excellent for covering instruments if they malfunction. Keep flashlights, calculators, plotters, etc., available but out of the way when not needed.
- Other organizational tools are kneeboards, lapboards, clipboards, chart bags, and yoke clips; some pilots like preprinted forms on which to copy weather and clearances. An approach chart holder centered on the yoke can be invaluable. You'll notice most high time pilots

don't carry a lot of stuff such as holding pattern computers, fancy plotters, and other gadgets. Use what serves you best, but keep it simple.

- If any of your preflight NOTAMs affect approach minimums or en route nav aids, be sure to mark a reminder on the approach or en route chart. Hours after reading the NOTAM, there's a pretty good chance you won't remember the details when it comes time to shoot the approach.

In Flight

- Listen to what's happening on the frequency—if other aircraft are ahead of you on an approach that might result in holding, slow down and advise ATC.
- Pick up ATIS or automated weather at least 50 miles out before getting into the approach phase.
- The frequency is a great party line for learning about weather, be it ice, thunder or turbulence. If things aren't too busy, query the controller about weather ahead. If you're getting into a bind, ask even if the frequency is busy. You might be sent to Flight Service, but get the information you need to make the right decisions.
- Although it may seem obvious, a descent through a layer of clouds full of ice doesn't have to be at the AIM-prescribed rate of 500 feet per minute. If an unusually fast or slow rate of climb or descent could cause a traffic conflict, ATC will almost always tell you ahead of time, i.e., "Give me best rate down; I need you at 6,000 in two minutes."
- Keep score—write down assigned altitudes, unless you've got a device to remind you. In sophisticated aircraft, the altitude preselect reminds the pilot 1,000 feet prior to reaching the selected altitude. Upon getting close, say 500 feet from an assigned altitude, put a finger next to the altimeter as a reminder that a level off will soon be needed.



A failed attitude indicator can be fatally distracting. Cover it up with Post-It® notes.



Don't be afraid to mark up your en route charts if you need to.

- Don't let ATC unnecessarily disrupt your routine. A request to fly an approach at a speed higher than you are comfortable with is just that, a request. Remember the magic word "unable."
- Keep a mental picture of what other aircraft on the frequency are doing. If an aircraft cleared for the approach in minimal weather conditions five minutes prior reports back on the approach frequency unexpectedly, it could be a wake-up call to review your alternate plans.
- Preselect communication frequencies as much as possible. If an aircraft ahead of you on the same routing gets a frequency change, there's a pretty good chance you'll get the same frequency. If it's in the standby window, you're one step ahead.
- Make sure ground control frequency is preselected before landing. There's no worse time to be hunting for frequencies than when you've turned off the active runway.

If you're afraid you'll forget your altitude assignment, write it down!



Weather and the Single Pilot

Getting safely from Point A to Point B, preferably with happy, comfortable and appreciative passengers, often involves fairly complex weather decision-making on the part of the pilot. Navigating IMC weather is a perfect situation in which to apply all the "cockpit resource management" (CRM) lessons you've read about.

CRM simply means efficiently using all available tools, including real-time weather information from cockpit equipment, ground-based systems and—most importantly—any view you might have out the cockpit windows. Particularly in the average light GA aircraft, with no radar, Stormscope or other storm detection equipment, a few good eyeball looks ahead are priceless.

Making best use of all weather CRM tools requires an understanding of weather basics, of course. The ASF Web site www.asf.org carries several free educational resources any pilot can use to strengthen his or her knowledge of what causes weather phenomena, and ways a pilot can predict it.

Many pilots start flight planning days before the planned takeoff, usually by watching the TV for trends, and the big picture. This is a key part of CRM because it can provide at least an idea if a particular flight will be feasible, and then if it is, what route or departure time would be best. Be aware, however, that long-range forecasts (i.e., any done before the morning of your planned takeoff) are very likely to change, sometimes substantially.

Closer to your planned launch time, weather CRM could include your observation of the sky on the way to the airport, a look at the TV or weather terminal radar display in the pilot lounge, a DUATs briefing or a call to Flight Service.

Learning how to analyze preflight weather data and how to formulate a plan to cope with it is an ongoing educational process for all pilots. The basics of analyzing weather and flight planning are available in the AOPA Air Safety Foundation safety advisor Weather Wise available online at www.asf.org in the library section.

Once en route, weather is often not as forecast. If things are better than expected, enjoy your good fortune. On the other hand, weather worse than expected will make you appreciate your contingency plan.

Monitoring weather while en route is much easier than it used to be, with multiple AWOS and ASOS stations, and ATIS broadcasts from larger airports. By making it a practice to monitor these broadcasts on the second radio, you can keep abreast of current weather (and more importantly, weather trends) without ever leaving the ATC frequency.

For a check of weather ahead, En route Flight Advisory Service (EFAS), known as “Flight Watch,” on 122.0 MHz is an invaluable service. EFAS briefers, located at flight service stations, are dedicated to providing information on the latest weather as observed by other pilots, ground reporting stations and weather radar. Information on thunderstorms, icing, low ceilings, visibility and turbulence is available here. For other FSS services, such as filing or amending flight plans, you will be referred to FSS briefers on a non-EFAS frequency.

Monitor your destination and alternate weather at least hourly while en route, more frequently if you suspect conditions are rapidly changing for the worse. If you need to make plans for diversion, sooner is better than later.

Once airborne, you often can get help in avoiding weather from the departure, center or approach controller. Although ATC's primary responsibility remains traffic separation, great strides have been made in weather radar displays available to controllers. You must ask, however, as controllers busy moving traffic will not always proffer weather avoidance advice. If you're receiving weather avoidance advice from one sector controller and are switched to another frequen-

cy, be sure to confirm with the new controller that weather avoidance advice will continue.

Onboard storm avoidance equipment such as airborne radar, datalink or Stormscope can help in avoiding extreme weather, but it doesn't make the weather any less dangerous. It just helps to identify the hazard location. ATC is most generous, whenever possible, in allowing deviations based on in-cockpit information. When asking for deviations or altitude changes, do it as soon as possible. It is far better to ask for a 20 degree heading change when 50 miles away from building cumulus than a 40 degree change as you come up upon it. Likewise, in possible icing conditions ask for ice-free altitudes before it becomes critical.

However, having onboard weather detection equipment is not synonymous with competency in using it. Take the time to get proper training in its operation.

Avoid Distractions through Planning

Other distractions are self-induced, usually from failure to anticipate problems and plan ahead. Planning begins on the ground. Think through and mentally execute the entire flight, at least to the extent that you look at each phase of flight and say to yourself, “I expect to do A, B and C, and will need X, Y and Z available.” Look at the departure procedures (DPs) and standard instrument departures (SIDs) – as well as approaches you expect to fly or might be assigned, at both destination and alternate. If you make repeated trips along the same route or to the same airport, keep notes on a sticky note and attach it to a chart. Trying to anticipate which of a dozen standard terminal arrival routes (STARs) will be used is easy if you've been there several times before and always used the same one and have marked it accordingly.

Act Rather Than React

In flight, a systematic thought process similar to position reporting is especially helpful. It involves ‘events’ and ‘actions’ such as reporting where you are, giving the ETA at the next reporting point and the name of the subsequent one.

An “event” is a happening, such as station passage of a VOR or a waypoint, arrival at an altitude, interception of the glideslope, and so on. When an event happens, “action” is required. Say (to yourself) what the next expected event is, what action is required, and what will be the subsequent event. As an example, think of intercepting the localizer on an ILS approach. “At intercept, I will turn to the inbound heading and start a descent to 2,000 feet. The next event will be arrival at 2,000 feet. All I have to do in the meantime is track the localizer and descend. When I get to 2,000



A moving map display is priceless for situational awareness, particularly when being vectored for an approach.

feet, I will level off and start looking for glideslope intercept.” As each event happens and the required action has been taken, mentally define the next event and subsequent one. Some pilots think aloud, others silently. Either way, a systematic thought process helps prevent surprises and keeps you ahead of the aircraft.

The five Ts, **Time**—note the time passing the fix—if needed, **Turn** the aircraft to the new heading or altitude, **Twist** the OBS to the new course, **Throttle**—adjust power as needed, **Talk**—advise ATC as required once the aircraft is going in the right direction.

Your mind should arrive at an event at least two minutes ahead of the aircraft. If you’re not able to consistently do this—you’re not ready for SPIFR. Strategic decisions involving weather may require thinking as much as an hour ahead of the aircraft.

There are many pilots who fly instruments precisely, but have no systematic way of anticipating their next move, to the extent that they become ineffective as instrument pilots. Some pilots being vectored for localizer interception concentrate so hard on the heading and altitude that they fly right through the localizer. Try this thought process consciously a few times, and see if your preparedness improves.

Know Where You Are—Always

Maintain “positional awareness.” This simply means knowing where you are at all times. Follow your position even when being vectored, know what to anticipate next and there will be no surprises. A moving map display makes positional awareness easy; lacking that, a DME or GPS derived distance comes in handy. If you have a GPS unit with a moving map display, operation in the map mode is particularly helpful. In any event, a positionally aware pilot is much more likely to catch an ATC error.

Equally as important in SPIFR is “situational awareness.” Is the fuel remaining adequate or have routing changes or extensive vectoring consumed more than planned? Is the current weather consistent with the forecast for both the destination and alternate or is the trend different than forecast? Can you expect a straight-in approach, or will it be necessary to circle to land? What is the taxi route after landing? Don’t let your guard down after touchdown—numerous runway incursions and collisions with stationary objects occur when distracted. Stay aware and alert until the airplane is tied down, chocked or hangared.

Unofficial Copilot

What about using a nonpilot passenger as a “copilot?” Many pilots report that a knowledgeable and willing pas-

senger is of great benefit in retrieving charts or other paperwork, keeping the cockpit orderly, changing frequencies or transponder codes, checking ATIS or other advisory services, and watching for traffic when in VFR conditions. If they know how to read an altimeter, they can call out 500 feet and 100 feet reminders before the flight reaches an assigned altitude. Obviously, you'll want to verify altitudes, but a passenger callout is a convenient backup. Passengers can also remind you to switch fuel tanks when necessary.

Caution: asking inexperienced or over-enthusiastic passengers to help can actually increase a pilot's workload, rather than decreasing it. Some training and a good pre-flight briefing are essential for any spouse or companion who is a frequent passenger, and who wants to help. They should always tell you what they are about to do such as changing a frequency, knob or setting. Brief them in advance that there will be times when your attention will be completely devoted to flying the airplane. ASF recommends a "sterile cockpit" during departure until clear of the terminal area and upon arrival in the terminal area. This means no extraneous conversation unless it's to point out traffic in visual conditions or to something they think might be a hazard.

Currency and Training

Without question, the most important pieces of the single-pilot IFR equation are currency and recurrent training. Of course, pilots should be physically and mentally healthy, and well versed in the rules, procedures and customs of instrument flying. Skill is a result of innate ability, intelligence, and motor reactions, developed by training and perfected by practice. Remember when it took 100 percent of your attention just to fly straight and level? A proficient instrument pilot needs almost no conscious thought for basic aircraft control.

All flying is a matter of continuously correcting deviations from the desired flight parameters. Skill is measured by how quickly you recognize a deviation and how smoothly you correct it. The "Old Pro," whose instruments always seem frozen in the correct position, has learned to perceive deviations almost before they become apparent and correct them with a small amount of smooth control pressure.

The learning process for instrument flying requires development of an ability to interpret and respond automatically to integrated instrument indications, rather than one-at-a-time interpretations. For instance, if your airplane is below the desired altitude, do you correct with pitch, power, or both? Do you trim? Obviously, it depends upon other things such as airspeed, attitude and the magnitude of the change. If you have to think about it rather than seeing the situation as a whole and reacting instinctively, more practice is needed before solo instrument flight.

Instrument flying skill comes through practice, but all practice doesn't necessarily have to be in an expensive airplane. Simulators, procedures trainers, or PC-based training devices can help to retain and sharpen your basic flying skills. One hour in a simple trainer prior to an instrument flight can significantly improve your scan and technique

How much practice should I get—what about training in instrument meteorological conditions?

If you're new instrument pilot, maybe you don't have much, or even any, "actual" cloud time. This is not unusual, but the inside of a wet bumpy cloud and the underside of a hood have decidedly different characteristics. Try to get some actual IMC time with an experienced pilot or instructor so there will be no surprises when you do it alone. Arrival at minimum descent altitude (MDA) or decision altitude (DA) with nothing in the windshield except gray will quicken the pulse of any low-time instrument pilot. Better to have experienced it with a pro on board before attempting it solo.

Practice is essential, not only for beginning instrument pilots, but also long-time pilots. A flight with an instructor to check habits and review procedures can be highly beneficial. Instructors who are actively teaching instruments are likely the most current. Also, try to fly with different instructors. You'll be surprised how many new tidbits you pick up, and a fresh perspective is always helpful.

When you practice, don't forget emergencies, the ultimate distractions. If you use a simulator, compound the adversities until you're overloaded; it will teach much about your limitations, and expand your capabilities. When an emergency occurs, remember to take your time. Be deliberate, control the aircraft, handle the emergency, navigate, and then communicate.

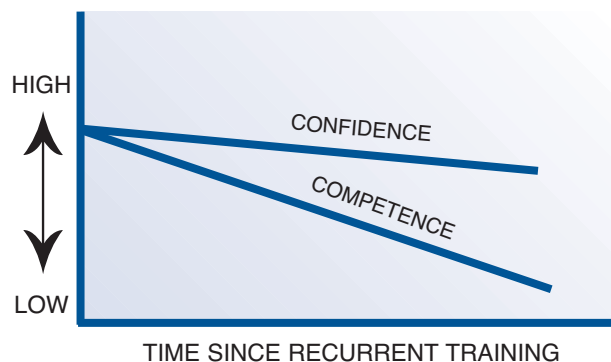


Figure 1

Confidence or Complacency?

The better you get, the more confident you become. That's good. But when confidence becomes complacency, that's trouble! Unfortunately, a pilot's skills tend to deteriorate faster than his confidence (see figure 1). Without periodic

testing and practice, it's easy to wind up in exactly that state—confidence well beyond competence.

Summary

Consider the following recommendations:

- Practice to stay current (include a simulator, procedures trainer or approved personal computer-based aviation training device (PCATD) if available).
- Don't let your confidence exceed your ability.
- Be aware of your mental and physical condition.
- Be aware of fatigue and manage it appropriately.
- Pay attention to detail when checking equipment and weather.
- Plan your flight thoroughly. Walk through your entire proposed flight, and rehearse alternative approaches, alternates, missed approaches, and emergencies.
- Organize the cockpit—charts, pens, hand-held transceiver/hand-held GPS.
- Stay continuously aware of your position, fuel remaining and the weather.
- Always have an alternative to any course of action.

Is single-pilot IFR safe? Safe instrument flying is a matter of attitude and discipline. If you have the proper attitude and the self-discipline to follow the recommendations made here, you can enjoy a long and successful career of single-pilot IFR flying.



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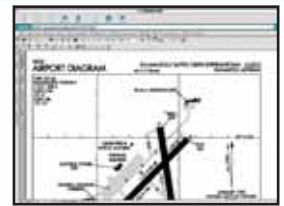
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