



STAN-EVAL NOTES
CIVIL AIR PATROL VIRGINIA WING
UNITED STATES AIR FORCE AUXILIARY
7401 Airfield Drive
Richmond, Virginia 23237-2250
January 2013



Taking off in low IFR: Taking off in low IFR can be challenging for any pilot but especially for low time instrument pilots or any pilot not at the top of their game. Although Part 91 allows departing below approach minimums, an IFR departure is prohibited by CAPR 60-1 if the conditions are not at or above the minimums at the departure airport. Airlines follow a similar rule and for good reason. We want to be sure if we launch, we can get back to the departure airport expeditiously if something goes wrong.

Taking off in low IFR when the minimums are met is still quite a challenge. The first challenge is the transition from visual references to instrument flying. With low ceilings and visibility there is little time to make the adjustment and little margin for error given the proximity to terrain and obstacles after takeoff. It is not unusual for the pilot to experience spatial disorientation when entering IMC so focusing on the instruments is crucial. There can be a very strong urge to drop the nose when the aircraft is accelerating as you enter IMC as it feels like the nose is going up too fast. Dropping the nose after takeoff has been the cause of many fatalities. If we maintain the attitude indicator at the correct angle (usually about 8 degrees for our aircraft) and ensure we are climbing, we can avoid inadvertent loss of altitude at this critical time. If we see airspeed increasing it means we've let the nose drop and need to instantly re adjust our climb attitude. This inadvertent dropping of the nose also happens to VFR pilots when taking off at night so it's something to always guard against IFR or VFR.

The next challenge is handling ATC while establishing the climb and ensuring the airplane is properly configured (gear up, flaps up, climb power set, airspeed set, attitude set, and initial course set). It's a very busy time but ATC wants to talk to you. Fly the airplane first! ATC can wait. Once you are established you can talk to ATC.

Some of the stress of taking off in low IFR can be avoided by proper preparation. Mentally prepare for the tasks you need to accomplish during takeoff. Most importantly, have a plan in mind if you have a problem immediately after takeoff. Do you have the approach charts handy if you need to make an immediate return? Many pilots will actually load (not activate) the return approach to the airport prior to takeoff so that it is readily available with a minimum of button pushing. Ensure you are familiar with the departure procedures and are ready for any changes ATC might hand you. If you get a last minute change by the tower to depart a runway you weren't planning for, ask the tower to hold you somewhere on the airport till you have time to review what that might mean for departure (Different SID? Different routing?). Any changes to your clearance and route may be best dealt with while still on the ground.

Another stress reducer is if there is someone knowledgeable in the right seat. Get them to help! They can handle radios, checklists, and charts.

VFR Altitudes: When planning a VFR flight we should consider what altitude to fly for each phase of flight. There are various considerations.

- There is the familiar hemispherical rule which states that for westbound directions (180 – 359 degrees) we should fly even thousands plus 500. So that would mean 4500 or 6500 and so forth. East bound flights should fly odd thousands plus 500 (3500, 5500, etc). This rule is not mandatory and does not apply below 3000 feet AGL. However, although not mandatory, it lessens the chance of mid air

collisions by keeping opposing traffic at different altitudes. And remember that it's based on track, not heading.

- In high density traffic areas, some pilots recommend flying either a 100' above or below these cardinal altitudes to further reduce the probability of mid air collision (this assumes everyone else is flying the cardinal altitudes so it's not clear this is a really good idea).
- Approaching various types of airspaces provides other constraints for VFR altitudes. For example, approaching Richmond, you must fly higher than 4200' MSL to remain clear of the Class C airspace or fly under 1400' MSL to fly under the outer ring.
- When flying the pattern, the traffic pattern altitude (TPA) is usually published in the AFD. If no published TPA exists, fly 800 to 1000' AGL, if practicable. If you are at a towered airport, ATC may specify a particular altitude for either takeoff or landing.
- When departing VFR at night from an airport, follow the obstacle departure procedure (ODP) associated with that airport. Most airports in VAWG have ODP's and the ODP will save your life as it ensures terrain clearance. If no ODP is published, study your sectional carefully or talk to local pilots about the best way to depart and altitudes to maintain.
- A night VFR flight should consider the minimum elevation figures (MEF's). Those are the altitudes you see on sectionals that ensure terrain clearance. Unless you are very familiar with your route, choose an altitude greater than the MEF to avoid hitting anything.
- If you really aren't sure where you are, but in the Commonwealth of Virginia, Mt Rogers at 5728' is the highest point (sans towers and trees). If you fly higher than 5728' and hit something, it means you are not in Virginia.
- CAP has other constraints on VFR altitudes. CAPR 60-1 prohibits sustained flight (e.g. this doesn't apply for takeoff, landing, or any operation where safety dictates otherwise) during the day below 1000' AGL or during the night below 2000' AGL. If you are a Cadet Orientation Pilot, there are additional altitude restrictions associated with orientation flights.
- Finally, VFR altitudes to fly should consider wind and fuel efficiency. Pick an altitude consistent with safety and operational concerns that minimizes any headwinds and maximizes any tailwinds. Most non turbo charged piston GA aircraft are most efficient between 7000 and 8000 feet MSL (but check your POH).

Changes to CAPR 60-1: A revised CAPR 60-1 was released with some significant changes. Every VAWG pilot should take the time to review the changes carefully. Some of the changes include:

- A flight/sortie is defined as starting when the aircraft begins to move on takeoff and ends when the propeller stops (with some exceptions such as a F5 for an IP where a seat change is required). This definition works for most ops but leaves one a little confused if you start the engine, taxi, but return before "moving for takeoff".
- Specific requirements for using the CAP call sign in the flight plan with the tail number in the comments section are defined (with some exceptions). This shouldn't be a change for most pilots.
- Requirements for using non corporate aircraft are better defined.
- A new category of CAP pilot is defined – VFR G1000 pilot.
- The 15 hour requirement for CAP instructors of G1000 aircraft is removed but replaced with a more formal training program (more on that to come).

- New training requirements for G1000 pilots, instructor pilots, check pilots, and check pilot examiners. Click [here](#) to read about it and be sure to complete the training within the next six months.

Recommendations for a Check Ride: CAPR 60-1 requires that the check pilot giving an initial Form 5 in either the GA8 or G1000 aircraft cannot be the person recommending the candidate for the check ride. The intent here is clear: CAP wants the instructor pilot and the check pilot to be different people so at least two knowledgeable people can evaluate the candidate. It does not mean that the check pilot cannot give any instruction in the aircraft to the candidate. What this does mean is that a check pilot that may have previously provided training to the form 5 applicant may give the check ride as long as another instructor or check pilot has flown with the applicant since that training. The applicant cannot go directly from training with a check pilot to a Form 5 with the same check pilot unless another instructor has flown with the applicant and can independently recommend the candidate for the check ride.

New Links worth reviewing on NHQ Web Site: Its worth going to the NHQ website (click [here](#)) and go to the CAP Pilot page where you will find quite a few links marked as “New”. You’ll find things such as a new Form 5 form, new G1000 training, guidance on EFBs, and other useful information. Take the time to review these.

G1000 Endorsement: CAP has changed the way qualifications for G1000 aircraft are treated. If you go to Ops Quals, you’ll no longer see G1000 listed as an aircraft. Instead, the G1000 qualification is listed in endorsements similar to an IFR endorsement or a Cadet O Ride endorsement.

In Praise of DeLorme Maps: Mission pilots are trained to use gridded aeronautical maps when doing search missions. However, in searches involving ground teams, it can be difficult to coordinate as ground teams will use road maps, topographical maps, or other ground based references. It’s not very helpful to the ground team for an aircrew to report a point of interest 25 DME miles from Flat Rock VOR. It is helpful if the aircrew can give a specific ground based reference such as a road intersection or a feature along a river. DeLorme maps are good for this as they provide detailed ground references such as roads, rivers, creeks, and other prominent features. In addition, it’s easy to correlate them to a gridded aeronautical map as each page of a DeLorme map is based on a 30’ by 30’ grid that coincides precisely with standard grids.

More complexity for Mission Pilots and Mission Observers: Mission Pilots and Observers in VAWG need to handle a variety of equipment depending on the aircraft being used. With the introduction of the GPS 400W’s we now must be able to do missions using one of the following navigators:

- G1000 which has a built in SAR function
- GX60 which has a built in SAR function but different from the G1000
- GX55 which has a built in SAR function identical to the GX60
- GNS 480 which has no SAR function
- GPS 400W which has no SAR function

Dealing efficiently and effectively with so many different navigators can be a challenge. Be sure you know the basics which are:

- Be able to enter and reference a user waypoint (either to mark a point of interest or mark the beginning/end of a search pattern/area)
- Understand how to display current latitude longitude that automatically updates as you fly

With these two features you can do any search pattern. Using the built in SAR features are helpful but that is not available with many of our navigators. For those who fly with iPads, there are now apps that can provide SAR functionality when the CAP navigator cannot. However, don’t forget that every Mission Pilot is expected to be able to fly a mission, including search patterns, without a GPS.

A world without GPS: We have featured several articles on the vulnerability of GPS and urged pilots to remain proficient in non GPS navigation. When GPS goes down is precisely when the nation will need CAP the most so be ready for it. Here's another article emphasizing GPS vulnerability to jamming. Click [here](#) for the full article.

"Researchers have developed three attacks capable of crippling Global Positioning System infrastructure critical to the navigation of a host of military and civilian technologies including planes, ships and unmanned drones. The scenarios developed include novel remote attacks via malicious GPS broadcasts against consumer and professional-grade receivers, which could be launched using \$2,500 worth of equipment. A 45-second crafted GPS message could bring down up to 30 percent of the global GPS Continuously Operating Reference Stations, while other attacks could take down 20 percent of NTRIP networks, security boffins from Carnegie Mellon University and firm Coherent Navigation have said."

Entering Crew Manifests of more than Four: If you fly the GA8 or other CAP aircraft that can carry more than four crew members, you may wonder where you put the names since the WMIRS sortie template only allows four entries. The answer is to enter them in the associated e104. The e104 template allows up to eight entries. The sortie template and the e104 are linked so any crew you enter in the sortie template is automatically filled in the e104.

How to Flunk your Form 5 Check Ride: Most Form 5 check rides are successful. Within VAWG and across all of CAP the check ride failure rate varies from about 2% to 4%. Form 5 check rides are evaluation flights, not training so it's useful to remind pilots some really good ways to ensure you fail (asterisk implies items not necessarily required for an abbreviated Form 5):

- You arrive for the check ride without bringing the necessary paperwork
 - Pilot certificate
 - Medical
 - Logbook (evidence of your last BFR and that you are current for carrying passengers)
 - The latest copy of 60-1
 - On line Form 5 completion certificate*
 - On line Cadet Orientation Quiz certificate if you are applying for O ride privileges*
 - On line SFRA course completion certificate*
 - A blank Form 5
 - Completed aircraft questionnaires for the a/c you are being tested for
- Forgot to get a flight release (unless you no longer have a valid Form 5 in which case the check pilot will get the flight release)
- Haven't done the ground handling video in the last two years
- Aren't safety current
- Can't do a weight & balance
- Can't recite the memory items on your aircraft emergency checklist (the bolded items are memory items)
- Don't have a working knowledge of Part 91. You don't need to memorize this but show general familiarity and know when you don't know.*
- Don't have a working knowledge of CAPR 60-1.*
- Failure to think safety and risk management
- Failure to clear the area before doing maneuvers (stalls, slow flight, etc)
- Failure to constantly be looking for traffic (look before you turn)
- Can't do a steep turn
- Don't use the CAP checklists.
- Can't operate CAP specific equipment – You really need to be able to operate the CAP radio and know the related switches. You do NOT need to be able to operate the ELT DF or other specialty equipment.
- Never heard of a KOEL

- Demonstrate a cavalier or unprofessional attitude
- Scare the check pilot

Reader Feedback and Postscripts: Several comments were received on the December Newsletter. First the big blooper caught by one astute reader. In the article titled “Winter is Coming”, CO₂ poisoning was mentioned. Of course, it’s carbon monoxide poisoning, not carbon dioxide! Back to chemistry 101. Carbon monoxide is a colorless odorless toxic gas that is a byproduct of combustion engines. Breathing it in large concentrations is fatal. Carbon dioxide is a natural byproduct of organisms (including humans) but generally not toxic. Of course, it won’t substitute for oxygen so can be fatal in high concentrations. Carbon dioxide is what kills submariners when oxygen levels get low.

Another reader cautioned against using automotive de icing fluid as it is very anemic and can refreeze unless temperatures are at or above freezing. If you do use it, make sure it has not refrozen before takeoff or remove all slush right after application. Another caution is that even if temperatures have crept above freezing but the aircraft is cold soaked, the flying surfaces may still be frozen.

One reader commented on the article “When do I set my Altimeter on Approaches?” Rather than waiting till you are established on the approach as the article recommended, this reader stated it should be done when you copy the ATIS. The AIM is not clear on this point but caution is advised in re setting the altimeter too early.

In the article “Filing ICAO Flight Plans”, we failed to mention that there are very useful links on the CAP website on the Stan Eval page including a training link.

Articles for the VAWG Stan Eval Newsletter: We are always looking for brief articles of interest to VAWG pilots to include in this newsletter. CAP has many very experienced pilots and aircrew who have useful techniques, experiences, and tips to share. Please send your contribution to steve.hertz@ngc.com. If your article is accepted, you will get a pro rata share of the VAWG Stan Eval Newsletter subscription fees.