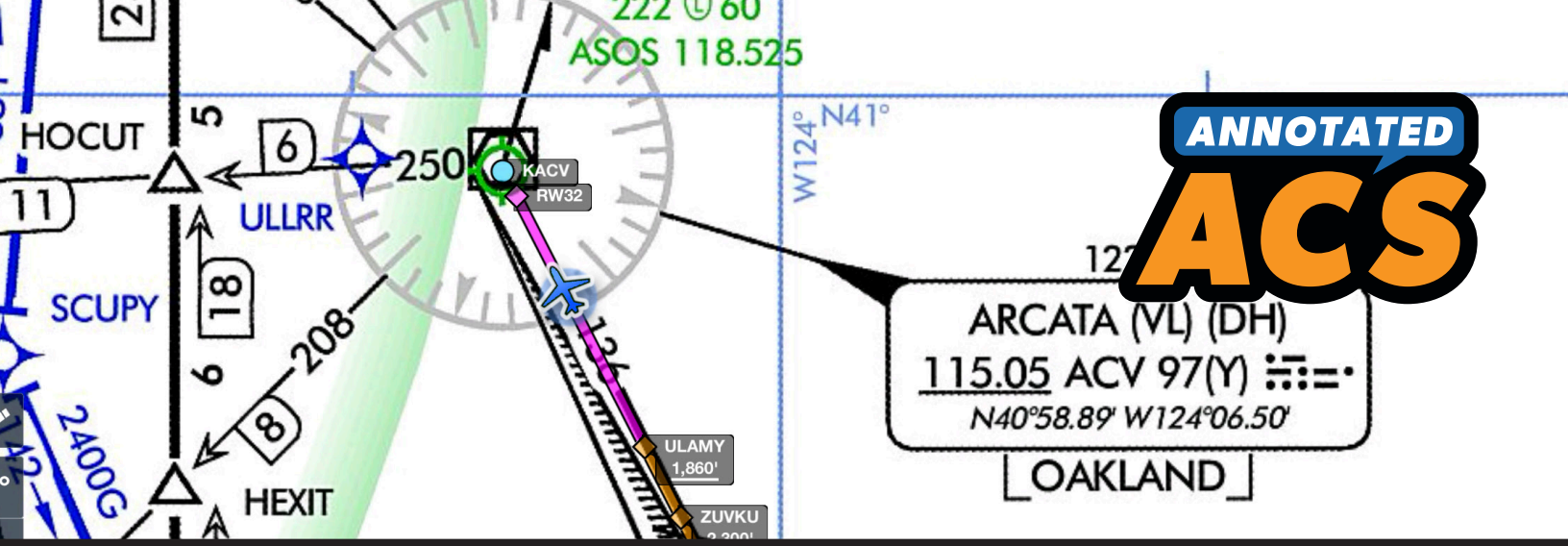


ANNOTATED ACS

CHECKRIDE INSIGHTS

Instrument Pilot

The following are sample pages from this manual. Details on the complete manual are available at pilotworkshops.com

What Instructors, Check Airmen, and Examiners wish applicants knew to ace the FAA Practical Exam

PILOT WORKSHOPS

WEATHER INFORMATION (CONTINUED)

- *IR.I.B.K3* Meteorology applicable to the departure, en route, alternate, and destination for flights conducted under Instrument Flight Rules (IFR) to include expected climate and hazardous conditions such as: 6
  - *IR.I.B.K3a* a. Atmospheric composition and stability
  - *IR.I.B.K3b* b. Wind (e.g., windshear, mountain wave, factors affecting wind, etc.)
  - *IR.I.B.K3c* c. Temperature and heat exchange
  - *IR.I.B.K3d* d. Moisture/precipitation
  - *IR.I.B.K3e* e. Weather system formation, including air masses and fronts
  - *IR.I.B.K3f* f. Clouds
  - *IR.I.B.K3g* g. Turbulence
  - *IR.I.B.K3h* h. Thunderstorms and microbursts
  - *IR.I.B.K3i* i. Icing and freezing level information
  - *IR.I.B.K3j* j. Fog/mist
  - *IR.I.B.K3k* k. Frost
  - *IR.I.B.K3l* l. Obstructions to visibility (e.g., smoke, haze, volcanic ash, etc.) 7
- *IR.I.B.K4* Flight deck instrument displays of digital weather and aeronautical information.

6 | Use This Element as a Weather Briefing Checklist

Weather interpretation is a consistently weak area in IFR flight tests. It's a critical skill for IFR pilots, so I will want to ensure the candidate has both a theoretical understanding of weather and a practical understanding of how it will affect a particular flight.

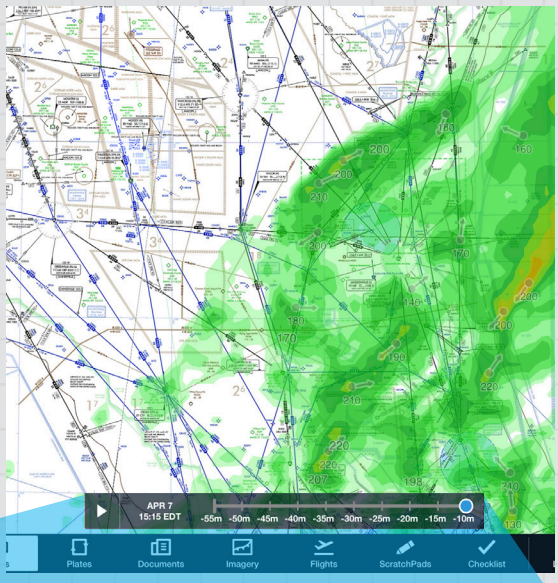
The K3 knowledge elements require a good understanding of weather theory. This theory is an important prerequisite to a practical understanding of how weather will affect any trip.

I recommend you use the K3 sub-elements as a checklist. You should be able to confidently answer questions on any of the items listed. If you can't, it's time to get back into the books.— *David G. (DPE)*

7 | Smoke Is a Flight Reality Like Never Before

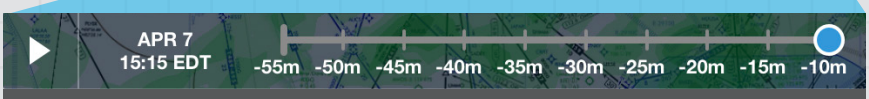
Given how prevalent forest fires are in most parts of North America, candidates should be able to determine if smoke will be a factor for a planned flight, and what dangers it could present if encountered.

Where there's smoke is mostly a matter of where the fires are and the wind direction, but more important is that it can reduce visibility to Instrument Meteorological Conditions (IMC). This could also lead to a discussion of firefighting TFRs. — *David G. (DPE)*



NEARBY WEATHER

- **KGRN: Gordon Municipal** 6m
  3562' MSL, CTAF 122.8
  190° at 15 - 22 kts, 10 sm, sky clear
  29.91 inHg, 9°C (-2°C dewpoint)
  12.6nm NE, course 65°M
- **KIEN: Pine Ridge** 29m
  3333' MSL, CTAF 122.9
  200° at 18 - 28 kts, 10 sm, sky clear
  29.90 inHg, 11°C (-3°C dewpoint)
  17.3nm N, course 345°M



You will be asked about the delay for datalink weather. The key thing to remember is that reports include an issue time so you know how far in the past that condition was true. A METAR from 40 minutes ago may mean nothing when conditions are changing rapidly. Also remember the timestamp on NEXRAD is when the image mosaic was completed or transmitted. There's an additional delay of about 5 minutes between the actual radar scans and that image being ready to transmit. — PilotWorkshops

CROSS-COUNTRY FLIGHT PLANNING (CONTINUED)

Skills: The applicant exhibits the skill to:

IR.I.C.S1	Prepare, present, and explain a cross-country flight plan assigned by the evaluator including a risk analysis based on real time weather, which includes calculating time en route and fuel considering factors such as power settings, operating altitude, wind, fuel reserve requirements, and weight and balance requirements.
IR.I.C.S2	Recalculate fuel reserves based on a scenario provided by the evaluator.
IR.I.C.S3	Create a navigation plan and simulate filing an IFR flight plan.
IR.I.C.S4	Interpret departure, arrival, en route, and approach procedures with reference to appropriate and current charts. 8
IR.I.C.S5	Recognize simulated wing contamination due to airframe icing and demonstrate knowledge of the adverse effects of airframe icing during pre-takeoff, takeoff, cruise, and landing phases of flight as well as the corrective actions.
IR.I.C.S6	Apply pertinent information from appropriate and current aeronautical charts, Chart Supplements; Notices to Air Missions (NOTAMs) relative to airport, runway and taxiway closures; and other flight publications. 9

8 | Make Sure the Downloads Are Up-to-Date

I *will* ask you how you know the information on your EFB is up-to-date. — *David G. (DPE)*

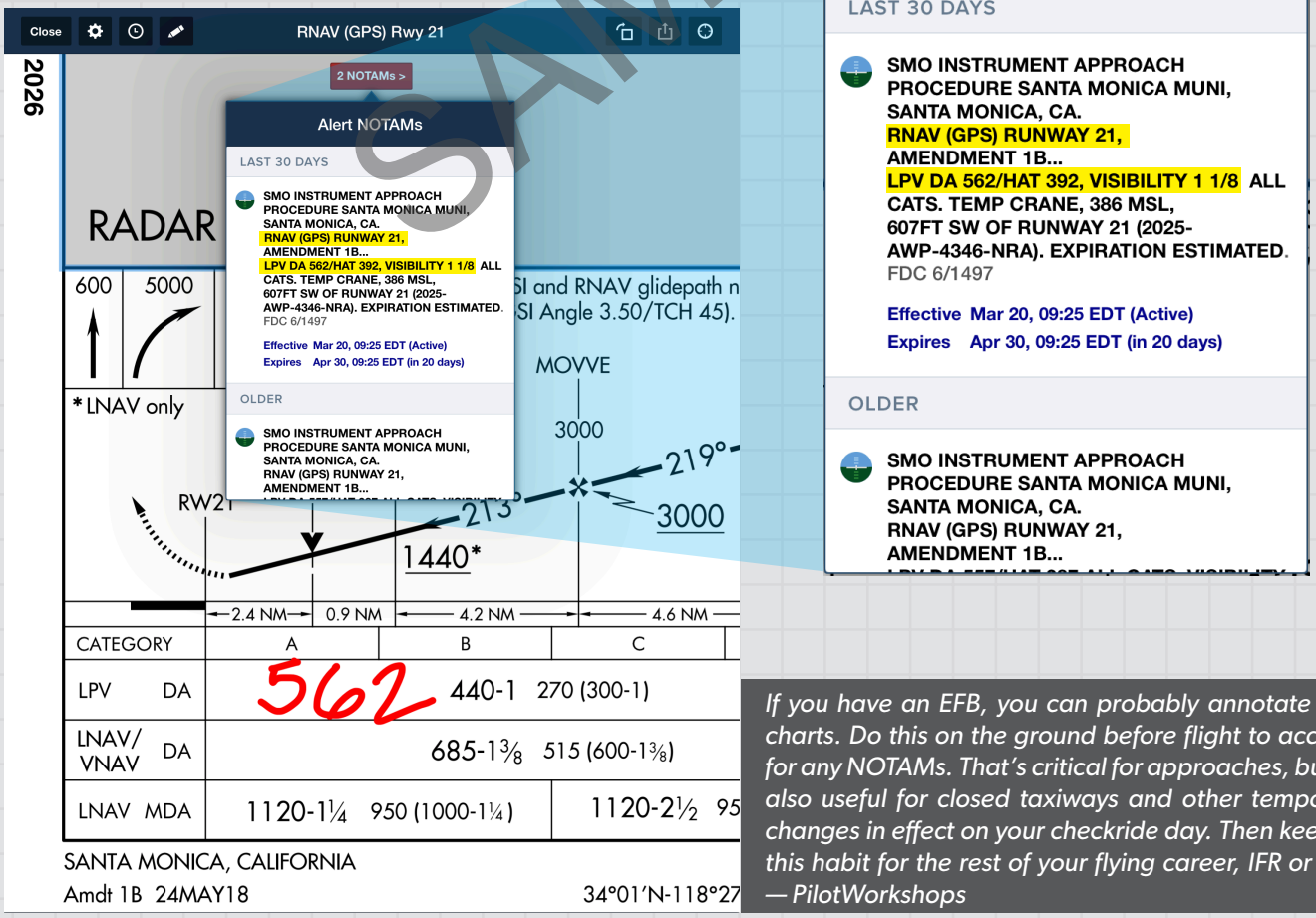
9 | NOTAMs Really, Really Matter

Yes, NOTAMs always matter for all flights VFR or IFR. But there are far more NOTAMs that apply to IFR, as they can modify procedures because of temporary items.

Suppose there's a crane near the airport, but not directly aligned with a runway and well below pattern altitude. There will be an airport NOTAM about it and it might be on the ATIS for a towered airport. But if VFR, it's not something you'd hit during a normal traffic pattern and you could get away with never accounting for it.

Under IFR, however, that crane penetrates the protected airspace required for the instrument approach. Even though hitting it would mean you were beyond full-scale deflection, the procedure must change.

Flying to the wrong minimums on your flight test is an instant bust. Flying an IFR procedure in the clouds without incorporating the NOTAMs could mean busting something much more important. — *Jeff V. (CFI)*



If you have an EFB, you can probably annotate your charts. Do this on the ground before flight to account for any NOTAMs. That's critical for approaches, but it's also useful for closed taxiways and other temporary changes in effect on your checkride day. Then keep up this habit for the rest of your flying career, IFR or VFR. — PilotWorkshops

AIRCRAFT FLIGHT INSTRUMENTS AND NAVIGATION EQUIPMENT (CONTINUED)

IR.II.B.K2 Operation of the aircraft's applicable navigation system(s), including: 5

IR.II.B.K2a Very high frequency (VHF) Omnidirectional Range (VOR), distance measuring equipment (DME), instrument landing system (ILS), marker beacon receiver/indicators 6

IR.II.B.K2b Area navigation (RNAV), global positioning system (GPS), Wide Area Augmentation System (WAAS), flight management system (FMS), autopilot 7

IR.II.B.K3 Use of an electronic flight bag (EFB), if used. 8

Risk Management: The applicant is able to identify, assess, and mitigate risk associated with:

IR.II.B.R1 Monitoring and management of automated systems.

IR.II.B.R2 Difference between approved and non-approved navigation devices.

IR.II.B.R3 Modes of flight and navigation instruments, including failure conditions.

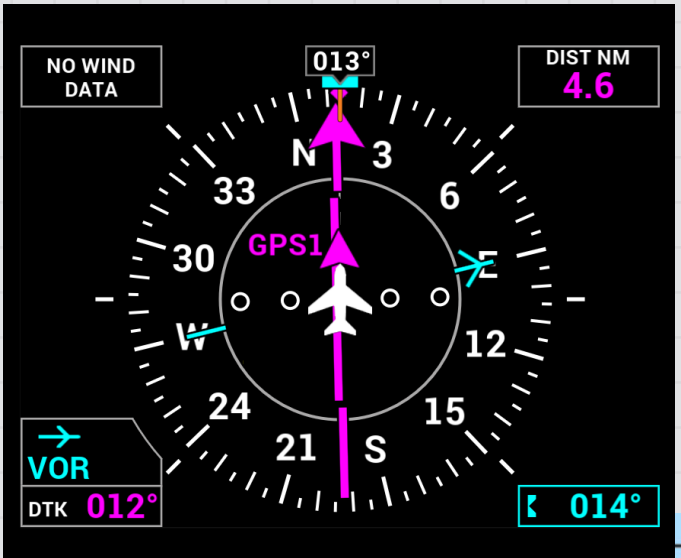
IR.II.B.R4 Use of an electronic flight bag.

IR.II.B.R5 Use of navigation databases.

Skills: The applicant exhibits the skill to:

IR.II.B.S1 Operate and manage installed instruments and navigation equipment. 9

IR.II.B.S2 Operate and manage an applicant supplied electronic flight bag (EFB), if used.



Do you know how to use bearing pointers to complement GPS? Maybe even supplanting GPS when necessary? — Bruce W. (CFI)

5 | It's Radio Antennas on the Ground vs. Satellites

This is often the most difficult topic for instrument applicants. If an applicant truly understands the differences, they can describe each system, and list the pros and cons of each one, in less than 5 minutes. Be one of those candidates. *— Doug S. (DPE)*

6 | Do and Log That VOR Check

If your instructor hasn't done a VOR check with you, do this before you come for your checkride. It's easy at an airport with a VOT. Otherwise, the quickest way may involve a flight over a landmark using two VOR receivers. No matter what, document that check somewhere so you have it for the checkride. *— Catherine C. (DPE)*

VOR checks are often overlooked. Reference 14 CFR 91.171 on VOR Equipment Check for IFR Operations. *— Elaine K. (CFI)*

7 | Know Where to Look Up GPS Error Codes

The only common failures on the basic Nav/Com are the flag on the CDI or a failure to ID the station. A modern integrated VOR/ILS/GPS navigator can have numerous caution or warning messages. Candidates should know the common ones (such as loss of GPS integrity) and where to find information on the more cryptic and obscure ones (because no one knows all of them). *— David G. (DPE)*

8 | How Do You Know the EFB Is Right?

I always ask the candidate to prove that the EFB data is up to date. I also want to know what the plan is if the EFB fails. Have answers to these questions. *— David G. (DPE)*

9 | There's No Time to Fumble with the GPS

I have seen IFR flight tests that started well but unraveled when the candidate struggled to program or manipulate data in the GPS navigator. This either resulted in a departure from the desired flight path, which usually ended the ride right there, or such distraction that they got irrecoverably behind the airplane. You must know the navigator programming and reprogramming tasks cold. *— David G. (DPE)*

I observed one applicant follow a flagged glidepath down until he was 700' below the actual glidepath. The needle was centered (because it was failed and flagged) but he thought that it meant he was perfectly on glidepath. Other applicants have followed reciprocal course headings on the GPS where the white line was in front of them and the magenta behind. They were flying a centered course ... back to a previous fix.

Watch out for CDI flags and know your color coding for your navigator. *— Name Withheld (DPE)*

Task A. Intercepting and Tracking Navigational Systems and DME Arcs

References: 14 CFR part 91; AIM; FAA-H-8083-2, FAA-H-8083-3, FAA-H-8083-15, FAA-H-8083-16, FAA-H-8083-25; POH/AFM

Objective: To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with intercepting and tracking navigation aids and arcs solely by reference to instruments.

Note: The evaluator should reference the manufacturer's equipment supplement(s) as necessary for appropriate limitations, procedures, etc.

Note: See Appendix 3: Aircraft, Equipment, and Operational Requirements & Limitations for information related to this Task.

Knowledge: The applicant demonstrates understanding of:

IR.V.A.K1	Ground-based navigation (orientation, course determination, equipment, tests, and regulations), including procedures for intercepting and tracking courses and arcs.
IR.V.A.K2	Satellite-based navigation (orientation, course determination, equipment, tests, regulations, interference, appropriate use of databases, Receiver Autonomous Integrity Monitoring (RAIM), and Wide Area Augmentation System (WAAS)), including procedures for intercepting and tracking courses and arcs.

HOW IS THIS TESTED? *Again, this is mostly covered during the oral portion. It just happens naturally as part of the flight test.*

CAPERS: a GPS-era 5Ts

Course for the next segment and verify nav source
Altitude for the next segment
Performance profile using the pitch, power, and configuration for the next segment
Estimated time enroute (ETE) to next fix
Radio frequencies set and required transmissions made
Safety and switches flow check as needed
Then review your next C-A-P

*The Five Ts (Time, Turn, Throttle, Tune/Twist, and Talk) are still taught—but, frankly, they really belong to the pre-GPS era. However, a mantra to help you stay ahead of the airplane as you cross each fix is still handy. A GPS-savvy one is **CAPERS**. As you approach each fix, review the C-A-P:*

*The next **Course** you'll fly, which is also probably the next heading you'll fly before wind correction. That could be the same heading you're already on. Also check that your navigator is providing the right info for that as GPS or VLOC. You could call this "course and source."*

*The next **Altitude** you'll fly. It might not change.*

*The next **Performance Profile** you'll use. These are "the numbers" you have for all phases of IFR flight.*

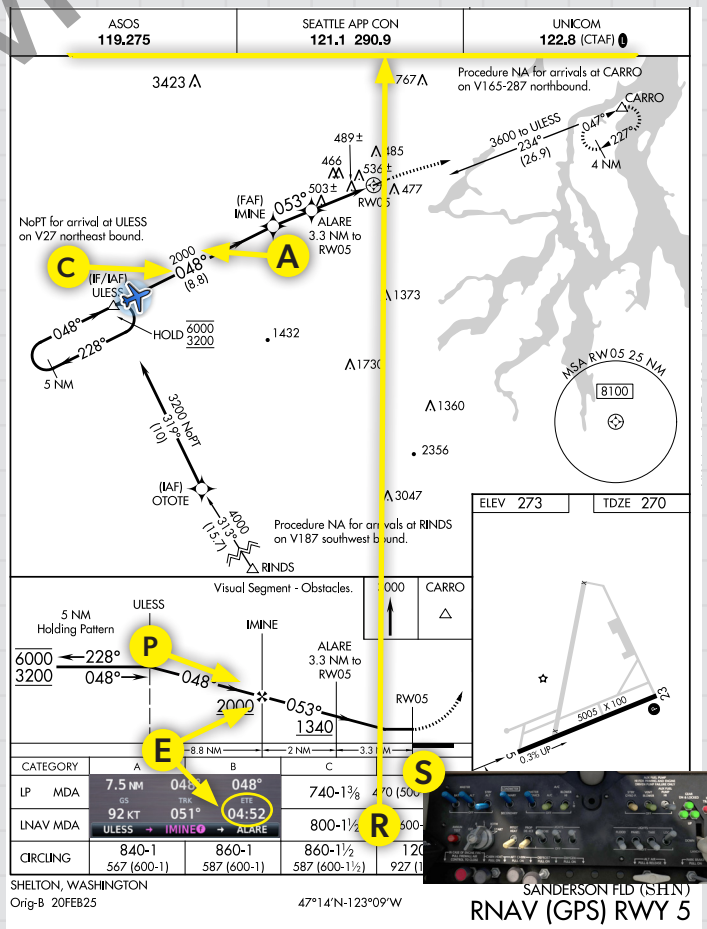
As you cross the fix, make those three changes (unless the next course, altitude, or profile is the same).

*Then check the **ETE** to the next fix. This tells you how much time you have before your next action. It's also a reminder to verify the GPS has sequenced to the fix you expected.*

*Then it's your **Radios** to talk to ATC or CTAF. Maybe turn up the pilot-controlled lighting.*

*Finally, **Safety and Switches**, which includes any checklist that might be appropriate, such as pre-landing.*

If you really want to stay ahead, pre-load in your mind the C-A-P for the next fix. —Jeff V. (CFI)



Task B. Departure, En Route, and Arrival Operations

References: 14 CFR parts 91, 97; AC 90-100, AC 90-105, AC 91-74; AIM; FAA-H-8083-2, FAA-H-8083-3, FAA-H-8083-15, FAA-H-8083-16, FAA-H-8083-25; POH/AFM

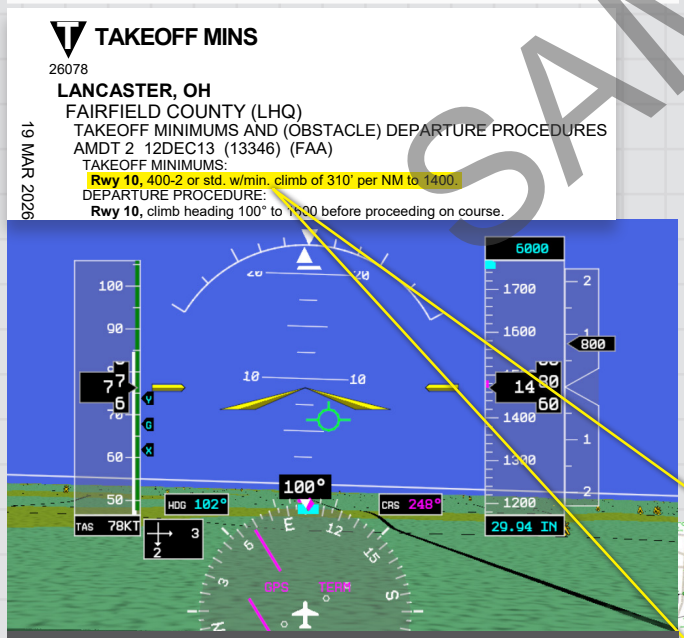
Objective: To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with IFR departure, en route, and arrival operations solely by reference to instruments.

Knowledge: The applicant demonstrates understanding of:

- *IR.V.B.K1* Elements related to ATC routes, including departure procedures (DPs) and associated climb gradients; standard terminal arrival (STAR) procedures and associated constraints. 1
- *IR.V.B.K2* Pilot/controller responsibilities, communication procedures, and ATC services available to pilots.

Risk Management: The applicant is able to identify, assess, and mitigate risk associated with:

- *IR.V.B.R1* ATC communications and compliance with published procedures.
- *IR.V.B.R2* Limitations of traffic avoidance equipment.
- *IR.V.B.R3* Responsibility to use "see and avoid" techniques when possible.



Remember that the standard required climb is 200 feet per NM, not per minute. You must do the math for what your climb rate would have to be. However, you can monitor that gradient with some EFBs.

Also remember that non-standard climb gradients are shown with the takeoff minimums. Takeoff minimums are optional for Part 91 flight, but meeting required climb gradients is mandatory. Unless you feel like doing forestry with your propeller. — PilotWorkshops

HOW IS THIS TESTED? *You should always know the plan to get from where you are to the next fix or decision point. That plan has a lateral and vertical component so the whole flight is a smooth progression without sharp turns, or high rates of climb or descent.*

1 | Get Some Departure Procedure Experience

Departure Procedures (DPs) are often neglected during IFR training. Even if you won't fly a complicated departure during the practical test, be prepared to discuss the various types of DPs, explain the charts, describe how you confirmed that your aircraft is capable of meeting the required climb gradients, and so forth.

Understand that takeoff minimums might not apply to Part 91, but required climb gradients do. For that matter, consider whether you will respect the takeoff minimums even under Part 91. *— Bruce W. (CFI)*

Watch out for Top Altitudes on departure procedures. These apply unless amended by ATC. *— Wally M. (DPE)*

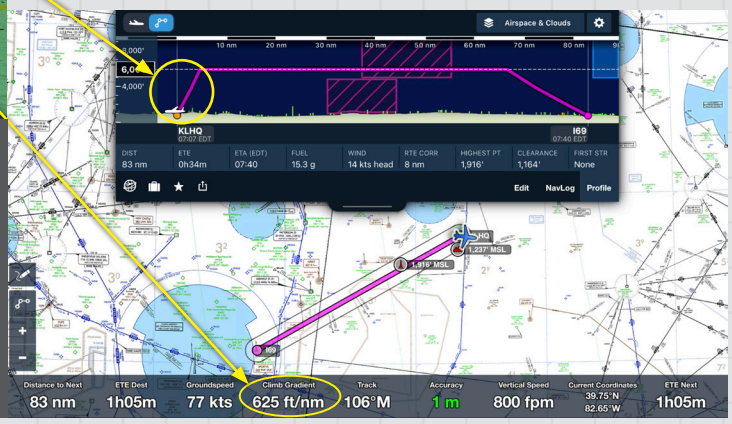
It's possible that you'll never actually fly a DP or SID/STAR in your training. If possible, don't let that happen. Make your instructor at least fly these with you in a simulator. Make sure you fully understand when and how these procedures are flown. They are the default clearances at busy airports. *— David G. (DPE)*

Generally, DPs fall into two buckets. There are ODPs for obstacle or terrain avoidance near the airport. There are SIDs for navigational or air-traffic management in busy areas. SIDs also incorporate obstacle and terrain avoidance into their design.

It's easy to find and practice basic ODPs at many airports. Do some ground planning to figure out climb requirements, then fly some. *— Elaine K. (CFI)*

For STARs, Just Know What They're For

STARs, like SIDs, are more common for turbine traffic and the charted altitudes reflect this. But you still must know how to interpret them. It's common for ATC to assign some of the fixes on these procedures to small aircraft, but with more suitable altitudes than what's on the chart. *— Elaine K. (CFI)*



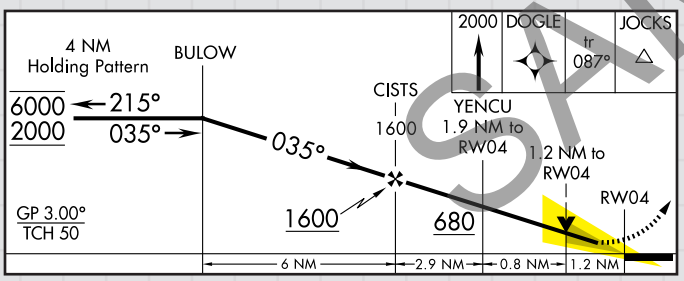
NON–PRECISION APPROACH (CONTINUED)

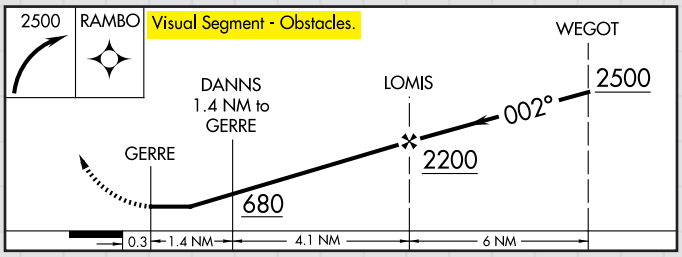
Risk Management: The applicant is able to identify, assess, and mitigate risk associated with:

- *IR.VI.A.R1* Deviating from the assigned approach procedure.
- *IR.VI.A.R2* Selecting a navigation frequency.
- *IR.VI.A.R3* Management of automated navigation and autoflight systems. 4
- *IR.VI.A.R4* Aircraft configuration during an approach and missed approach.
- *IR.VI.A.R5* An unstable approach, including excessive descent rates. 5
- *IR.VI.A.R6* Deteriorating weather conditions on approach.
- *IR.VI.A.R7* Operating below the minimum descent altitude (MDA) without proper visual references. 6

Skills: The applicant exhibits the skill to:

- *IR.VI.A.S1* Accomplish the non-precision instrument approaches selected by the evaluator.
- *IR.VI.A.S2* Establish two-way communications with air traffic control (ATC) appropriate for the phase of flight or approach segment, and use proper communication phraseology.
- *IR.VI.A.S3* Select, tune, identify, and confirm the operational status of navigation equipment to be used for the approach.





The gray stipple means the 34:1 slope from DA to the threshold is clear of obstacles. A VDP means the 20:1 slope must be clear of obstacles. (See "Expect the examiner to point to a VDP symbol" on page 39.) On the other hand, the text, "Visual Segment - Obstacles" means there are objects in that 20:1 (3°) slope to the runway you must see to avoid. They won't likely be right on centerline, but they will be nearby. You'll also likely see that approaches with this note are NA at night—for exactly the same reason. — PilotWorkshops

4 | Carefully Manage Altitude Arming and Capture

When flying a coupled, non-precision approach with multiple step-downs, as soon as one altitude is captured, arm the next step-down altitude. *— Doug S. (DPE)*

You have to manage the vertical component of the flight path on a non-precision approach. If you have an advisory glidepath (e.g., "LNAV+V") use it, but make sure you respect all crossing restrictions and don't descend below MDA without the appropriate runway identification in sight. The autopilot won't respect either of these if it's following a glidepath.

I will always ask about this if you intend on using an advisory glidepath on the flight. *— David G. (DPE)*

5 | Anticipate the Descent Rate, Even with +V

Unstable approaches on checkrides are pretty common, especially on VOR approaches or others that don't offer advisory vertical guidance.

Make a mental note for yourself of the descent rate that you'll need to comfortably arrive at the MDA. Then add a little bit to make sure you will reach MDA before the MAP in case you start a little late or descend too shallowly. *— Name Withheld (DPE)*

Use advisory vertical guidance to your advantage if you can. It's not cheating. It helps you get the descent rate needed, accommodating for winds, and avoids the old "chop and drop" method in the pre-GPS days. *— Catherine C. (DPE)*

FAA guidance defines a stabilized approach as one where the pilot maintains a constant angle flight path towards a predetermined landing point.

The FAA is emphasizing the importance of stabilized approaches, particularly for non-precision approaches and the dangers of unstabilized approaches. For non-precision approaches, the continuous descent final approach (CFDA) technique should be used. Review FAA Advisory Circular AC 120-108 and insist that your instructor covers this technique.

I expect the candidate to the know the core stabilization criteria with respect to flight path, airspeed, configuration, descent rate, and power settings. They should include confirmation the approach is stabilized in their checklists/briefings.

As a general comment, unstabilized approaches of all types generally start with being too high and too fast. ATC can jam you up with a late descent clearance or assign a minimum speed they want you to maintain. If necessary play the "unable" card to avoid getting set up to fail. Go missed early if you must, rather than trying to force a bad approach. *— David G. (DPE)*

6 | Flight Below MDA Requires a Runway in Sight

Ensure you level off at the MDA, of course, and don't descend until you have enough visual cues to avoid any obstacles between you and a safe landing. *— Catherine C. (DPE)*

Task C. Missed Approach

References: 14 CFR parts 91, 97; AIM; FAA-H-8083-2, FAA-H-8083-3, FAA-H-8083-15, FAA-H-8083-16, FAA-H-8083-25; Terminal Procedures Publications

Objective: To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with performing a missed approach procedure solely by reference to instruments.

Knowledge: The applicant demonstrates understanding of:

IR.VI.C.K1 Elements related to missed approach procedures and limitations associated with standard instrument approaches, including while using a flight management system (FMS) or autopilot, if equipped.

Risk Management: The applicant is able to identify, assess, and mitigate risk associated with:

IR.VI.C.R1 Deviations from prescribed procedures or ATC instructions. 1

IR.VI.C.R2 Holding, diverting, or electing to fly the approach again. 2

IR.VI.C.R3 Aircraft configuration during an approach and missed approach.

IR.VI.C.R4 Factors that might lead to executing a missed approach procedure before the MAP or to a go-around below DA, DH, or MDA, as applicable.

IR.VI.C.R5 Management of automated navigation and autoflight systems.

HOW IS THIS TESTED? *Yet another task that you've done over and over in training. Just remember: Basically every missed approach ever starts with "climb."*

1 | Sometimes Deviation Is the Right Move

Alternate missed approach procedures can be common in training and on your checkride where ATC gives you a plan for the missed that sets you up for the next approach you requested. Sometimes these happen by NOTAM because of a navaid outage, approach procedure change, or other reason.

So that you're ready for an alternate missed approach procedure, make sure that you understand how to add the appropriate fixes and hold to the flight plan, and how to skip or delete the standard missed approach procedure. *— Bruce W. (CFI)*

2 | Only Brief the Beginning of the Missed

Don't overbrief the published miss. How you'll enter the hold isn't important, and you'll probably forget what you said anyway. Brief just the initial key elements, which are usually a climb and turn. Fill in the subsequent details if and as needed. *— Bruce W. (CFI)*

Everybody seems to glance down at the missed approach procedure on the chart as they approach DA. Don't do this. You'll lose one or both needles. Instead, write the initial heading and altitude for the missed approach on a sticky note and stick it on the panel. — Wally M. (DPE)

CIRCLING APPROACH (CONTINUED)

Skills: The applicant exhibits the skill to:

IR.VI.D.S1	Comply with the circling approach procedure considering turbulence, windshear, and the maneuvering capability and approach category of the aircraft.
IR.VI.D.S2	Confirm the direction of traffic and adhere to all restrictions and instructions issued by ATC or the evaluator.
IR.VI.D.S3	Use single-pilot resource management (SRM) or crew resource management (CRM), as appropriate.
IR.VI.D.S4	Establish the approach and landing configuration. Maintain a stabilized approach and a descent rate that ensures arrival at the MDA, or the preselected circling altitude above the MDA, prior to the missed approach point.
IR.VI.D.S5	Maintain airspeed ±10 knots, desired heading/track ±10°, and altitude +100/-0 feet until descending below the MDA or the preselected circling altitude above the MDA.
IR.VI.D.S6	Visually maneuver to a base or downwind leg appropriate for the landing runway and environmental conditions. 3
IR.VI.D.S7	If a missed approach occurs, turn in the appropriate direction using the correct procedure and appropriately configure the airplane.
IR.VI.D.S8	If landing, initiate a stabilized descent. Touch down on the first one-third of the selected runway without excessive maneuvering, without exceeding the normal operating limits of the airplane, and without exceeding 30° of bank.

3 | The Circling Pattern Will Look Low

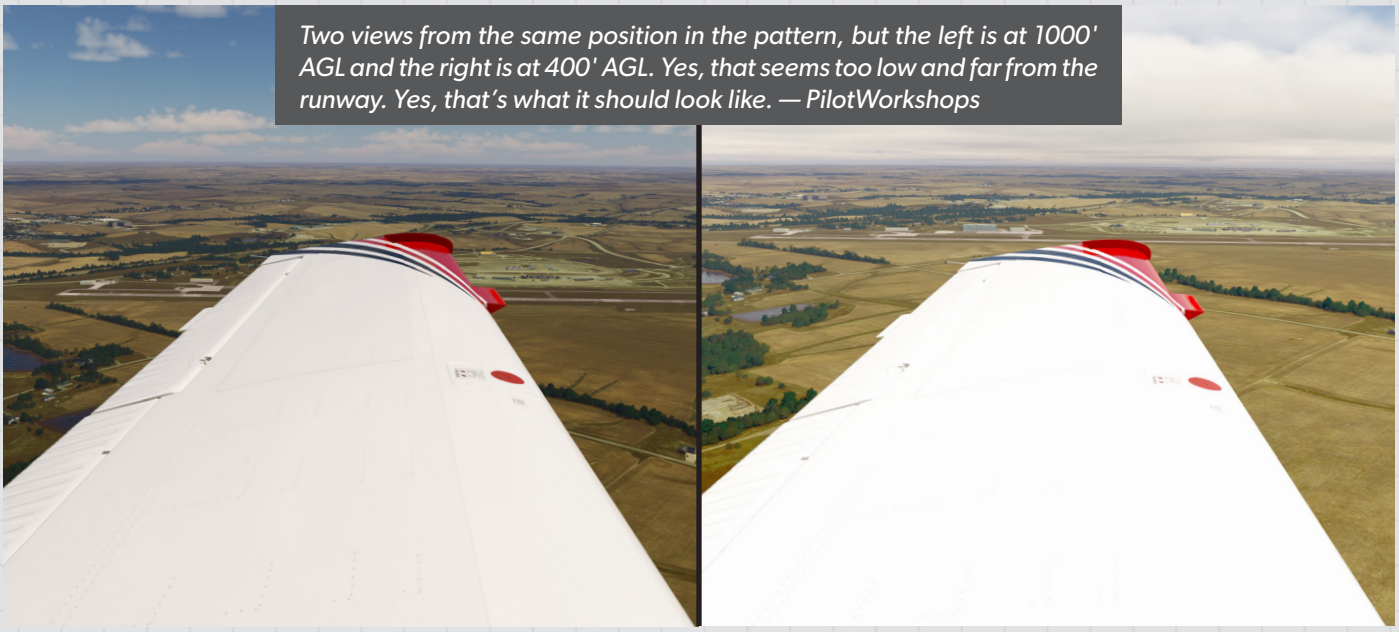
The number one issue I see with circling approaches on flight tests is not establishing the appropriate elements of a standard pattern. The applicant's "pattern" becomes an ugly oval, which often results in crowding the runway and an over-banked turn.

Circling MDAs are often significantly lower than the normal VFR pattern altitudes. You must anticipate the different sight picture that will be seen from the lower altitude. *— David G. (DPE)*

Usually instrument exams happen in excellent VMC and the circling maneuver is done without a view-limiting device. But it's often the reason for a notice of disapproval. If the MDH is, say, 500' AGL instead of the normal 1000' AGL pattern, candidates use the same visual references on the downwind for spacing so they are half as far out from the runway. That means a hairpin turn onto final and an overshoot. If it's that easy to do in perfect VMC, think what it would be like in craggy clouds and low visibility? A notice of disapproval, while disappointing, is a far better outcome than the accident that would almost certainly happen later on. Really think about how you'll perform a circling maneuver and inspire confidence in the examiner. *— Catherine C. (DPE)*

Turn radius is based on bank angle and airspeed (well, groundspeed, as wind has an effect), not the altitude of your pattern. You must fly the same lateral distance from the runway to turn 180° without overshooting whether you're at 1000' AGL or 400' AGL. That's unless you want to either slow down or bank steeper, neither of which is recommended on a flight test.

This means the circling pattern looks like you're really, really low ... because you are. Add a tailwind component in that 180° turn and you need even more space. This takes practice to feel comfortable with. But you have 1.3 miles (at least) of space for this, which is way wider than your typical pattern. Learn how to use it. *— Jeff V. (CFI)*



Two views from the same position in the pattern, but the left is at 1000' AGL and the right is at 400' AGL. Yes, that seems too low and far from the runway. Yes, that's what it should look like. — PilotWorkshops

Task D. Approach with Loss of Primary Flight Instrument Indicators

References: 14 CFR part 91; FAA-H-8083-2, FAA-H-8083-3, FAA-H-8083-15, FAA-H-8083-16, FAA-H-8083-25; POH/ AFM; Terminal Procedures Publications

Objective: To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with performing an approach solely by reference to instruments with the loss of primary flight control instruments.

Knowledge: The applicant demonstrates understanding of:

IR.VII.D.K1 Recognizing if primary flight instruments are inaccurate or inoperative, and advising ATC or the evaluator. 1

IR.VII.D.K2 Possible failure modes of primary instruments and how to correct or minimize the effect of the loss. 2

Risk Management: The applicant is able to identify, assess, and mitigate risk associated with:

IR.VII.D.R1 Use of secondary flight displays when primary displays have failed. 3

IR.VII.D.R2 Maintaining aircraft control.

IR.VII.D.R3 Distractions, task prioritization, loss of situational awareness, or disorientation.

Skills: The applicant exhibits the skill to:

IR.VII.D.S1 Advise ATC or the evaluator if unable to comply with a clearance.

IR.VII.D.S2 Complete a non–precision instrument approach without the use of the primary flight instruments using the skill elements of the non–precision approach Task (see Area of Operation VI, Task A). 4

IR.VII.D.S3 Use single-pilot resource management (SRM) or crew resource management (CRM), as appropriate.

4 | Your GPS Track Is Your Friend, as Always

With GPS being the predominant form of navigation nowadays, partial-panel navigation has become pretty simple. If the GPS is capable of providing Desired Track (DTK) and Track (TRK), and offers a backup CDI, all you need is there. If the CDI is centered, keep TRK equal to DTK and the CDI will not move. If the CDI is not centered, turn just enough towards the CDI needle until it's centered. Then resume matching TRK to DTK. *— Doug S. (DPE)*

HOW IS THIS TESTED? *Hopefully, you're flying with a redundancy-laden digital panel that makes this kind of a non-issue. However, some examiners will hit you with unrealistic multiple failures. The solution is practice in the plane you will fly on the test.*

1 | You Still Just Fly the Numbers

Back in the day, vacuum pump failures were common and the gyroscopic instruments became unusable to maintain pitch, bank, and heading. Many airplanes didn't have pitot heat or an alternate static source, so one could lose the use of the airspeed, altimeter, and vertical speed indicator.

Modern panels, with their amazing redundancy, make loss of primary flight instruments improbable. It's still possible, so I still choose to "fail" the attitude indicator (AI) and the HSI/DG. I leave the pitot-static system working, along with the GPS.

Even with this level of unlikely instrument removal, the applicant who can use the GPS and knows the requisite combination of pitch, power, and configuration for the flight profile needed, finds my "partial panel" somewhat of a non-event. *— Doug S. (DPE)*

2 | One Failure May Have Many Repercussions

You should consider all the combinations of failures that could be "loss of primary flight control instruments" for your aircraft. How does the failure of a display impact what you can see or where? What about a line replaceable unit (LRU) that drives some functions of both PFD and MFD?

Garmin publishes helpful guidance for CFIs and DPEs when simulating partial-panel operations. *— Bruce W. (CFI)*

Less for the test and more for the real world, remember that loss of something simple, like just your primary GPS, can have a huge impact on other items you might be used to. Your weather and traffic displays might be limited or not work at all. Your MFD might no longer show your position. It's helpful to know which systems depend on which other systems, even in a redundant glass cockpit. *— Jeff V. (CFI)*

Be prepared for various failure scenarios, not just for the top G5 being dimmed. The alternator can fail (and I want to see how you'd manage the remaining battery life). Your iPad could overheat. Sure, I have to test a primary instrument failure, but I can still ask about or simulate other things. *— Catherine C. (DPE)*

3 | It's a Full Backup, But in an Inconvenient Place

Even though you may have a fully functional backup AI or even PFD, one of the more difficult things can be looking off to one side or down by your knees to use it. Consider what makes life easier for you when this happens. You might want to jot down extra information from your approach chart and put it on a sticky note by the backup display.

Limit your head motions between checking backup instruments and glancing down for other cockpit tasks. This helps avoid spacial disorientation. *— Jeff V. (CFI)*

approaches required above on a single engine. This checks the box for maneuvering on one engine if your CFI times it correctly.
- Make at least one of your landings from an instrument approach with one engine secured (simulated).

A good instructor should spend ground time reviewing elements like weather and procedures as well, but that's actually not required per the ACS task table for an IPC. Instead of taking that as something to skip, exploit its freedom. Come prepared with a list of questions you have about weather, procedures, your avionics, or even your EFB.

Hit the Books. This Book, in Fact.

Pretty much everything in this book can be useful on an IPC, but here are a few high-value focus spots to prepare for your IPC, and where you'll find helpful comments, images, and captions in this book on those topics.

Flying by the Numbers. If you don't already have a chart with performance profiles for your airplane, create one and use it for the IPC. (There are blank charts you can use at the back of this book.) If you already have one, consider giving it a refresh for practice. Installing a new engine or engine monitor is another good reason to refresh your chart.

- *"3 | Get the Numbers, Fly the Numbers" on page 5*
- *"7 | Faster Is Often Easier" on page 37*

Weather. No need to go overboard, but find some nasty weather somewhere in the country and do some ground work with your instructor there. Also try and get updated weather inflight during the IPC for practice.

- *"1 | There Are Some Good FAA Resources Out There" on page 9*
- *"4 | Check the Location and Time for Every TAF" on page 10*
- *"6 | Use This Element as a Weather Briefing Checklist" on page 11*

Planning. Again, you should have this down if you're instrument rated and using the certificate. But there are areas that get shortchanged or forgotten:

- *"7 | Not All Alternates Are Created Equally" on page 13*
- *"3 | Plan for Terrain and Obstacles from Takeoff" on page 15*
- *"7 | The "ATC Cleared" Route Is Only a Starting Point" on page 16*
- *"9 | NOTAMs Really, Really Matter" on page 17*
- *Chart annotation image and caption on page 17*
- *"1 | Get Some Departure Procedure Experience" on page 34*

ATC and Clearances. If you regularly fly from nontowered airports, try an IPC starting at a towered one. Or vice-versa. Getting clearances by phone in remote areas is a consistent weak spot. So is radio work in general for many pilots. Also consider how a standard for setting up your avionics and using them can lower your workload.

- *"5 | Review Your Nontowered IFR Departures" on page 15*
- *CRAFT in reverse order image and caption on page 25*
- *"5 | Pace Yourself on the Radio" on page 26*
- *"2 | Use Standard Phraseology" on page 35*
- *"4 | Make Unambiguous Approach Requests" on page 36*

Holding. Have your instructor force a hold on a HILPT at the IAF or IF for an RNAV approach rather than the missed approach hold. This hold is much more likely and causes you to pause and resume GPS sequencing. Try and predict the hold entry before the GPS tells you. Try handflying holds while communicating and reprogramming the GPS.

- *Ad-hoc hold image and caption on page 27*
- *"2 | Just Get in the Hold on the Correct Side and Stay" on page 28*

Approaches. Given the IPC is about real-world safety, consider focusing on RNAV approaches. Even if a towered airport is using an ILS, there's almost always an equivalent LPV to the same runway you can request instead. ILS approaches require a CDI change and are subject to other limitations. In fact, you might consider making an "ILS checklist" to keep in your plane in case you must fly an ILS when you don't do it often. Also look for places to streamline your workload. If you're at 3000' when cleared for an approach where the segment is at 2600', why not lower your workload by intercepting the glidepath from 3000'?

- *A 5Ts replacement image and caption on page 32*
- *Custom EFB fields image and caption on page 34*
- *WIRE pre-approach acronym image and caption on page 36*
- *"1 | Distinguish Different Approaches and Fly Them" on page 39*
- *"3 | +V Guidance Says Nothing About Obstacles" on page 39*
- *VDP image and caption on page 39*
- *"6 | Anticipate the Effect of Changing Winds" on page 43*
- *"2 | Only Brief the Beginning of the Missed" on page 45*
- *"4 | Cram Smoothly, and Also Remember to Trim" on page 46*
- *"3 | The Circling Pattern Will Look Low" on page 48*
- *"1 | If You Cancel IFR, You Must Be Legal for VFR" on page 49*
- *"4 | Smooth Is a Good Proxy for Safe" on page 49*

Automation. Your autopilot is the tool you want to use for safety when taking on hard IMC in the real world. You should practice fully coupled autopilot approaches including a missed approach. Sure, some handflying is important, but consider handflying while enroute where you'll be busy and distracted between setting up approaches and talking to ATC, so you'll still get a workout.

- *Autopilot trimming image and caption on page 18*
- *"6 | Do and Log That VOR Check" on page 21*
- *"1 | More Ways to Intelligently Not Use the Compass" on page 22*
- *"5 | Checklists Require Actually Checking" on page 22*
- *Radial-to-airway intercept image and caption on page 35*
- *Vectors-to-Final (VTF) image and caption on page 37*