

SPLENDID AVIATION

Instrument Flight Study Guide

The go-to lesson companion for every flight

PA-28-140 TRAINING FLEET

Garmin GNS 430W and Garmin GNX 375 preparation tracks

Based on Splendid Aviation Instrument Rating - Airplane TCO Rev 0, July 1, 2026

STUDENT COPY

Student: _____

Course start: _____ Instructor: _____

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How to use this guide

This is a study companion for the flight syllabus. It is designed so one lesson page can be used independently before each flight. It does not replace the TCO, instructor assignment, aircraft checklist, POH/AFM, avionics AFMS, current charts, or current FAA publications.

1	Find your lesson Use the index or lesson number on the gradesheet. Confirm that any out-of-sequence lesson has the required authorization.
2	Read the assigned sources Complete the listed TCO ground lessons and primary references. Do not study from memory when a current chart, regulation, or aircraft document is available.
3	Prepare the actual flight Use the assigned tail number, installed avionics, current weather, NOTAMs, charts, performance data, route, and alternates.
4	Chair-fly out loud Say the sequence, callouts, source changes, altitudes, missed-approach actions, and likely ATC communications before entering the airplane.
5	Pass the self-check Answer all oral questions without guessing. Mark any uncertainty and resolve it with the instructor before dispatch.
6	Close the loop After the flight, review the instructor debrief and complete the next lesson's assignment before the next reservation.

IMPORTANT EQUIPMENT DISTINCTION

The GNS 430W includes GPS and VOR/localizer/glideslope capability. The GNX 375 provides GPS navigation plus transponder/ADS-B functions, but it is not a VOR/localizer/glideslope receiver. On a GNX 375 aircraft, conventional VOR/ILS/localizer tasks require the separately installed and approved NAV receiver/indicator. Always verify the exact aircraft configuration and AFMS.

Universal preflight study card

Use this card before every instrument flight in addition to the lesson-specific page.

Lesson	☐ Confirm lesson number, stage, objectives, planned tasks, and completion standard. ☐ Review the prior debrief and any incomplete or weak elements.
Pilot	☐ Confirm certificate, medical/qualification, recency as applicable, IMSAFE, and personal minimums. ☐ Identify the highest-risk human factor today and a specific mitigation.
Aircraft	☐ Use the exact tail's POH/AFM, supplements, weight and balance, equipment list, maintenance status, and checklist. ☐ Confirm required inspections/equipment, fuel/oil, performance margins, and discrepancy status.
Environment	☐ Review current and forecast weather, NOTAMs, runway/approach status, alternates, icing/turbulence, and escape options. ☐ Mark legal minimums, operational minimums, and personal minimums separately.
Route / procedure	☐ Brief clearance, departure, en-route altitudes, arrivals, approaches, missed approaches, diversions, and fuel gates. ☐ Use current charts and confirm each required navigation system is installed and approved.
Avionics	☐ Check database status, source selection, identifiers, CDI/HSI mode, active leg, frequencies, and transponder/ADS-B status. ☐ Know how to recover from wrong source, wrong leg, SUSP/OBS, loss of integrity, or unit failure.

THREE-MINUTE INSTRUCTOR READINESS BRIEF

- ☐ Today's lesson objective and completion standard.
- ☐ Three principal risks and how I will control them.
- ☐ Planned route/procedures and the first missed-approach actions.
- ☐ Aircraft/avionics configuration and any limitations that matter today.
- ☐ One weak area from the prior lesson and the specific correction plan.

Flight-course map and quick index

The TCO uses suggested lesson times; the total flight-course estimate is 39.5 hours. Completion depends on meeting each lesson, stage-check, and end-of-course standard, not merely logging the suggested time.

Stage	Lessons	Primary outcome	Suggested flight time
Stage I	1-13	Attitude instrument control, systems, partial panel, VOR/localizer navigation	16.2 hr
Stage II	14-23	Holding, precision/nonprecision/RNAV approaches, circling, missed approaches	12.3 hr
Stage III	24-28	IFR cross-country, decision making, stage check, end-of-course check	11.0 hr

No.	Study focus	Page
1	Aircraft orientation and basic attitude instrument flight	5
2	IFR systems, equipment, and cockpit checks	6
3	Full-panel precision, slow flight, stalls, and unusual attitudes	7
4	Systems malfunctions and partial-panel fundamentals	8
5	Partial-panel climbs, descents, timed turns, and emergencies	9
6	Partial-panel stalls, slow flight, and unusual attitudes	10
7	Spatial disorientation and partial-panel proficiency	11
8	VOR orientation, interception, and tracking	12
9	VOR tracking, intersections, and time-distance	13
10	VOR procedure proficiency	14
11	Localizer front-course and back-course tracking	15
12	Stage I preparation: full panel, partial panel, and navigation	16
13	Stage I check: attitude instrument flight and navigation	17
14	VOR holding: standard and nonstandard	18
15	VOR and localizer holding	19
16	Nonstandard, DME, and intersection holding	20
17	Nonprecision approaches and missed-approach planning	21
18	Nonprecision approaches, circling, and VDP	22
19	Nonprecision approach proficiency and landing transition	23
20	ILS introduction and precision-approach control	24
21	Precision/nonprecision integration and partial-panel approaches	25
22	RNAV/LPV procedures and Stage II preparation	26
23	Stage II check: holds and instrument approaches	27
24	IFR cross-country planning and departure procedures	28
25	IFR cross-country execution beyond 50 NM	29
26	Required long IFR cross-country	30
27	Stage III check: IFR cross-country proficiency	31
28	End-of-course instrument proficiency check	32

STAGE I

Flight Lesson 1: Aircraft orientation and basic attitude instrument flight

Dual local | Suggested 1.2 hr

Date: _____	Aircraft / Tail: _____	Instructor: _____
Airport / Route: _____	Avionics: [] GNS 430W [] GNX 375	Weather risk: L / M / H

Lesson focus: Learn the PA-28-140 IFR cockpit and establish precise aircraft control using only instrument reference.

STUDY BEFORE ARRIVAL

- TCO Ground Lessons 1, 2, and 3.
- Assigned PA-28-140 POH/AFM: documents, systems, limitations, normal procedures, performance, weight and balance, and installed instrument equipment.
- FAA Instrument Flying Handbook: attitude instrument flying and instrument cross-check.

CHAIR-FLY BEFORE DISPATCH

- Instrument cockpit check from battery on through taxi checks.
- Straight-and-level, standard-rate turns, climbs, descents, and level-offs using callouts.
- Unusual-attitude and stall recognition followed by the aircraft-approved recovery flow.

BE READY TO EXPLAIN

- Required aircraft documents, inspections, and IFR equipment for the assigned aircraft.
- How pitch, bank, power, and trim affect the primary/supporting instruments.
- How fixation, omission, and emphasis errors break an instrument scan.

AVIONICS PREPARATION

- Identify every installed navigator, NAV receiver, CDI/HSI, transponder, and database status.
- Demonstrate how to confirm the active navigation source without changing it inadvertently.

SELF-CHECK: ANSWER WITHOUT NOTES

- What proves this airplane is legal and ready for IFR today?
- Which instrument gives the earliest reliable indication for pitch, bank, and power changes?
- What will you do when your scan begins to break down?

READY-FOR-FLIGHT GATE

- [] I can state the lesson objective and applicable standard.
- [] I answered the self-check questions without guessing.
- [] I chair-flew the critical sequence without instructor prompting.
- [] I reviewed the current weather, charts, NOTAMs, aircraft documents, and instructor assignment as applicable.

TCO completion standard: Takeoffs and landings safely at least to private-pilot proficiency; maintain altitude +/-200 ft, heading +/-15 deg, and airspeed +/-15 kt.

Instructor direction, the TCO, current aircraft documents, and current FAA publications control if any conflict exists.

STAGE I

Flight Lesson 2: IFR systems, equipment, and cockpit checks

Dual local | Suggested 1.2 hr

Date: _____	Aircraft / Tail: _____	Instructor: _____
Airport / Route: _____	Avionics: [] GNS 430W [] GNX 375	Weather risk: L / M / H

Lesson focus: Connect the PA-28-140's instruments and systems to a disciplined IFR preflight and full-panel scan.

STUDY BEFORE ARRIVAL

- Complete the Lesson 1 assignment: TCO Ground Lessons 1-3, POH/AFM systems and equipment, and Instrument Flying Handbook scan material.
- POH/AFM: IFR preflight checks, inoperative equipment, abnormal procedures, and autopilot/AFCS if installed.

BE READY TO EXPLAIN

- Power source and failure indication for each required flight/navigation instrument.
- Pitot-static, vacuum/gyro, and electrical failure cues applicable to the assigned aircraft.
- When inoperative equipment requires grounding, deactivation, placarding, or maintenance action.

CHAIR-FLY BEFORE DISPATCH

- Instrument cockpit check, including source selection and annunciation verification.
- Airspeed change while holding altitude, then steep turn entry/recovery by reference to instruments.
- Engine-shutdown instrument/equipment check and discrepancy reporting.

AVIONICS PREPARATION

- Verify database status, annunciations, CDI/HSI source, audio panel, and transponder setup.
- If an autopilot is installed, identify its approved operating limits and immediate disconnect method.

SELF-CHECK: ANSWER WITHOUT NOTES

- What powers each primary instrument in this airplane?
- How would you detect a blocked pitot tube versus a blocked static source?
- Which checks must be complete before accepting an IFR clearance?

READY-FOR-FLIGHT GATE

- [] I can state the lesson objective and applicable standard.
- [] I answered the self-check questions without guessing.
- [] I chair-flew the critical sequence without instructor prompting.
- [] I reviewed the current weather, charts, NOTAMs, aircraft documents, and instructor assignment as applicable.

TCO completion standard: Show basic competence in full-panel attitude control and systems knowledge; maintain altitude +/-200 ft, heading +/-15 deg, and airspeed +/-15 kt.

Instructor direction, the TCO, current aircraft documents, and current FAA publications control if any conflict exists.

STAGE I

Flight Lesson 3: Full-panel precision, slow flight, stalls, and unusual attitudes

Dual local | Suggested 1.2 hr

Date: _____	Aircraft / Tail: _____	Instructor: _____
Airport / Route: _____	Avionics: [] GNS 430W [] GNX 375	Weather risk: L / M / H

Lesson focus: Increase control precision while recognizing abnormal indications and energy-state changes under the hood.

STUDY BEFORE ARRIVAL

- Complete the Lesson 2 assignment: TCO Ground Lessons 2 and 3.
- POH/AFM: flight instruments, abnormal indications, stalls, slow flight, unusual attitudes, and limitations.

BE READY TO EXPLAIN

- The difference between a control input, a performance trend, and a stabilized result.
- Stall warning cues available without outside visual reference.
- Why recovery must follow the airplane procedure, not a memorized instrument indication alone.

CHAIR-FLY BEFORE DISPATCH

- Slow-flight entry, configuration changes, stabilized maneuver, and recovery.
- Power-on and power-off stall recognition and recovery using positive control inputs.
- Nose-high and nose-low unusual-attitude recovery with verbalized instrument confirmation.

AVIONICS PREPARATION

- Confirm navigation source and flight-plan page without allowing programming to disrupt aircraft control.
- Practice the rule: aviate, identify, verify, then program.

SELF-CHECK: ANSWER WITHOUT NOTES

- Which indications confirm a trend rather than a single-instrument failure?
- What is your first priority in an unusual attitude?
- How will you prevent trim and configuration changes from overwhelming your scan?

READY-FOR-FLIGHT GATE

- [] I can state the lesson objective and applicable standard.
- [] I answered the self-check questions without guessing.
- [] I chair-flew the critical sequence without instructor prompting.
- [] I reviewed the current weather, charts, NOTAMs, aircraft documents, and instructor assignment as applicable.

TCO completion standard: Show basic IFR systems knowledge; maintain altitude +/-200 ft, heading +/-15 deg, and airspeed +/-15 kt, and correctly recognize/recover from stalls and unusual attitudes.

Instructor direction, the TCO, current aircraft documents, and current FAA publications control if any conflict exists.

STAGE I

Flight Lesson 4: Systems malfunctions and partial-panel fundamentals

Dual local | Suggested 1.2 hr

Date: _____	Aircraft / Tail: _____	Instructor: _____
Airport / Route: _____	Avionics: [] GNS 430W [] GNX 375	Weather risk: L / M / H

Lesson focus: Recognize failures early, confirm the failed source, and transition to a reliable partial-panel scan.

STUDY BEFORE ARRIVAL

- Complete the Lesson 3 assignment: TCO Ground Lessons 2 and 3 plus applicable POH/AFM abnormal indications and limitations.
- Preview TCO Ground Lesson 24 and aircraft procedures for electrical, vacuum/gyro, pitot-static, and communication failures.

BE READY TO EXPLAIN

- Failure cues for electrical, vacuum/gyro, pitot-static, and communication systems.
- How to cross-check before declaring an instrument failed.
- Immediate control priorities and which instruments remain trustworthy.

CHAIR-FLY BEFORE DISPATCH

- Detect, confirm, cover/ignore, and transition the scan after an instrument failure.
- Partial-panel straight-and-level, standard-rate turns, climbs, descents, and airspeed changes.
- Lost-communications decision flow using route, altitude, clearance limit, and approach timing concepts.

AVIONICS PREPARATION

- Identify which avionics are lost under each electrical-bus or circuit failure described by the aircraft documents.
- Explain how source annunciations or flags would change during a NAV/GPS failure.

SELF-CHECK: ANSWER WITHOUT NOTES

- What indications would make you suspect a gyro failure rather than turbulence?
- Which instruments remain usable after each likely system failure?
- When should you ask ATC for assistance or terminate the training scenario?

READY-FOR-FLIGHT GATE

- [] I can state the lesson objective and applicable standard.
- [] I answered the self-check questions without guessing.
- [] I chair-flew the critical sequence without instructor prompting.
- [] I reviewed the current weather, charts, NOTAMS, aircraft documents, and instructor assignment as applicable.

TCO completion standard: Recognize system/equipment failures and make the required change to the instrument cross-check while maintaining aircraft control.

Instructor direction, the TCO, current aircraft documents, and current FAA publications control if any conflict exists.

STAGE I

Flight Lesson 5: Partial-panel climbs, descents, timed turns, and emergencies

Dual local | Suggested 1.2 hr

Date: _____	Aircraft / Tail: _____	Instructor: _____
Airport / Route: _____	Avionics: [] GNS 430W [] GNX 375	Weather risk: L / M / H

Lesson focus: Build repeatable control techniques after losing primary flight or communication indications.

STUDY BEFORE ARRIVAL

- Complete the Lesson 4 assignment: TCO Ground Lessons 2, 3, and 24; POH/AFM failure procedures.
- Review AIM 5-3-3 and AIM 6-4-1 through 6-4-3; preview 14 CFR 91.185 and 91.187.

CHAIR-FLY BEFORE DISPATCH

- Instrument takeoff transition into a stabilized climb using instructor-directed references.
- Partial-panel timed turn to a heading, then constant-rate climb/descent and level-off.
- Loss-of-communications scenario from detection through landing plan.

BE READY TO EXPLAIN

- Compass turning errors and the limits of timed turns.
- What 14 CFR 91.185 requires in VMC and IMC after communications failure.
- When an equipment malfunction must be reported to ATC under 14 CFR 91.187.

AVIONICS PREPARATION

- Locate COM standby/active frequencies and identify alternate communication resources.
- Identify which displayed data remain valid after the simulated failure; do not assume all screen data share one source.

SELF-CHECK: ANSWER WITHOUT NOTES

- What route and altitude would you fly after lost communications in IMC?
- What must you tell ATC when navigation or approach capability is degraded?
- How do you control a partial-panel climb without chasing instruments?

READY-FOR-FLIGHT GATE

- [] I can state the lesson objective and applicable standard.
- [] I answered the self-check questions without guessing.
- [] I chair-flew the critical sequence without instructor prompting.
- [] I reviewed the current weather, charts, NOTAMs, aircraft documents, and instructor assignment as applicable.

TCO completion standard: Using partial panel, maintain altitude +/-200 ft, heading +/-15 deg, airspeed +/-15 kt, and climb/descent rate +/-150 fpm; recognize system malfunctions.

Instructor direction, the TCO, current aircraft documents, and current FAA publications control if any conflict exists.

STAGE I

Flight Lesson 6: Partial-panel stalls, slow flight, and unusual attitudes

Dual local | Suggested 1.2 hr

Date: _____	Aircraft / Tail: _____	Instructor: _____
Airport / Route: _____	Avionics: [] GNS 430W [] GNX 375	Weather risk: L / M / H

Lesson focus: Apply disciplined partial-panel control to high-workload, low-energy, and unusual-attitude situations.

STUDY BEFORE ARRIVAL

- Complete the Lesson 5 assignment: TCO Ground Lessons 2, 3, 5, and 24; 14 CFR 91.185 and 91.187; AIM communications-failure material.
- FAA Instrument Flying Handbook: partial-panel flight, scan, stalls, and unusual attitudes.

BE READY TO EXPLAIN

- How instrument loss changes the cross-check but not the aerodynamic recovery priorities.
- Why abrupt control inputs can worsen spatial disorientation and energy management.
- The difference between maintaining control and meeting a maneuver tolerance during an emergency.

CHAIR-FLY BEFORE DISPATCH

- Partial-panel slow-flight entry and recovery.
- Power-on and power-off stall recovery by reference to remaining reliable instruments.
- Nose-high and nose-low unusual-attitude recovery with a verbal instrument-validity check.

AVIONICS PREPARATION

- Practice minimizing head-down time: configure only after the airplane is stable.
- Identify a safe method to transfer navigation tasks to the instructor during training if workload becomes excessive.

SELF-CHECK: ANSWER WITHOUT NOTES

- Which control priority changes, if any, after losing a flight instrument?
- What instrument relationships confirm a stall recovery is working?
- What cues tell you to stop troubleshooting and focus solely on control?

READY-FOR-FLIGHT GATE

- [] I can state the lesson objective and applicable standard.
- [] I answered the self-check questions without guessing.
- [] I chair-flew the critical sequence without instructor prompting.
- [] I reviewed the current weather, charts, NOTAMS, aircraft documents, and instructor assignment as applicable.

TCO completion standard: Recognize stalls and recover without abrupt control use; perform correct unusual-attitude recoveries using full and partial panel.

Instructor direction, the TCO, current aircraft documents, and current FAA publications control if any conflict exists.

STAGE I

Flight Lesson 7: Spatial disorientation and partial-panel proficiency

Dual local | Suggested 1.2 hr

Date: _____	Aircraft / Tail: _____	Instructor: _____
Airport / Route: _____	Avionics: [] GNS 430W [] GNX 375	Weather risk: L / M / H

Lesson focus: Experience common vestibular illusions and prove that disciplined instrument reference overrides body sensations.

STUDY BEFORE ARRIVAL

- Complete the Lesson 6 assignment: TCO Ground Lesson 3 and Instrument Flying Handbook partial-panel material.
- TCO Ground Lesson 1 and Instrument Flying Handbook human factors, spatial disorientation, illusions, unusual attitudes, and recovery.

CHAIR-FLY BEFORE DISPATCH

- Verbalize the illusion, identify the reliable instrument picture, and maintain/restore the desired attitude.
- Partial-panel slow flight and stall recovery with a deliberate scan.
- Unusual-attitude recovery while ignoring misleading body sensations.

BE READY TO EXPLAIN

- How the vestibular system can create false sensations in acceleration and turning flight.
- Personal susceptibility factors: fatigue, illness, stress, medication, and fixation.
- The corrective habit: trust verified instruments and make measured control inputs.

AVIONICS PREPARATION

- Set up the minimum display needed for the task and reduce nonessential visual clutter.
- Explain when automation can reduce workload and when it can increase mode confusion.

SELF-CHECK: ANSWER WITHOUT NOTES

- Which illusion are you most likely to experience in a prolonged turn or acceleration?
- What personal condition would make today's instrument lesson unsafe?
- How will you break fixation if you notice it?

READY-FOR-FLIGHT GATE

- [] I can state the lesson objective and applicable standard.
- [] I answered the self-check questions without guessing.
- [] I chair-flew the critical sequence without instructor prompting.
- [] I reviewed the current weather, charts, NOTAMs, aircraft documents, and instructor assignment as applicable.

TCO completion standard: Partial panel: altitude +/-150 ft, heading +/-10 deg, airspeed +/-10 kt, rates +/-100 fpm; correct stall and unusual-attitude recoveries with positive control.

Instructor direction, the TCO, current aircraft documents, and current FAA publications control if any conflict exists.

STAGE I

Flight Lesson 8: VOR orientation, interception, and tracking

Dual local | Suggested 1.2 hr

Date: _____	Aircraft / Tail: _____	Instructor: _____
Airport / Route: _____	Avionics: [] GNS 430W [] GNX 375	Weather risk: L / M / H

Lesson focus: Build a correct mental picture of the aircraft, station, selected course, radial, and CDI sensing.

STUDY BEFORE ARRIVAL

- Complete the Lesson 7 assignment: TCO Ground Lessons 1 and 3 plus human-factors material.
- TCO Ground Lesson 4 and current AIM Chapter 1 material on VOR, DME, GPS/GNSS, WAAS, RNAV, and navigation-system accuracy.

BE READY TO EXPLAIN

- A radial extends FROM the VOR; the selected course and TO/FROM indication determine the CDI picture.
- Ground-check and airborne-check methods applicable to installed VOR equipment.
- How to select an intercept angle, recognize station passage, and correct for wind.

CHAIR-FLY BEFORE DISPATCH

- Draw the station, radial, aircraft position, OBS course, TO/FROM, and needle deflection.
- Call the intercept heading, intercept trend, lead, and wind-correction steps.
- Complete the aircraft's VOR accuracy-check record if the scenario requires it.

AVIONICS PREPARATION

- GNS 430W: identify when VLOC, not GPS, must drive the CDI for VOR work.
- GNX 375: use the separate installed VOR receiver/indicator; the GNX 375 is not a VOR/LOC/GS receiver.

SELF-CHECK: ANSWER WITHOUT NOTES

- If you are on the 180 radial, where are you relative to the station?
- What does a centered CDI prove, and what does it not prove?
- Is the aircraft's VOR check current for IFR use? Show the record.

READY-FOR-FLIGHT GATE

- [] I can state the lesson objective and applicable standard.
- [] I answered the self-check questions without guessing.
- [] I chair-flew the critical sequence without instructor prompting.
- [] I reviewed the current weather, charts, NOTAMs, aircraft documents, and instructor assignment as applicable.

TCO completion standard: Display basic knowledge of VOR orientation, radial interception, and tracking.

Instructor direction, the TCO, current aircraft documents, and current FAA publications control if any conflict exists.

STAGE I

Flight Lesson 9: VOR tracking, intersections, and time-distance

Dual local | Suggested 1.2 hr

Date: _____	Aircraft / Tail: _____	Instructor: _____
Airport / Route: _____	Avionics: [] GNS 430W [] GNX 375	Weather risk: L / M / H

Lesson focus: Maintain orientation while adding wind correction, crossing radials, and time-distance calculations.

STUDY BEFORE ARRIVAL

- Complete the Lesson 8 assignment: TCO Ground Lesson 4 and current AIM Chapter 1 navigation material.
- Review assigned Jeppesen Instrument/Commercial chapters as directed for Stage I preparation.

CHAIR-FLY BEFORE DISPATCH

- Intercept and track a radial inbound, then outbound, with explicit TO/FROM checks.
- Identify an intersection using the installed equipment configuration.
- Perform a time-distance calculation and state why a near-station result can be unreliable.

BE READY TO EXPLAIN

- How crossing radials define an intersection and what equipment is required.
- The purpose, setup, and limitations of VOR time-distance calculations.
- How wind correction changes after intercept and during station passage.

AVIONICS PREPARATION

- Confirm the CDI/HSI source before every VOR intercept.
- Do not substitute GPS distance or bearing for a required VOR operation unless the procedure and equipment approval allow it.

SELF-CHECK: ANSWER WITHOUT NOTES

- What wind-correction trend tells you the chosen correction is insufficient?
- What equipment configuration lets you identify the assigned intersection?
- What assumptions does the time-distance calculation require?

READY-FOR-FLIGHT GATE

- [] I can state the lesson objective and applicable standard.
- [] I answered the self-check questions without guessing.
- [] I chair-flew the critical sequence without instructor prompting.
- [] I reviewed the current weather, charts, NOTAMs, aircraft documents, and instructor assignment as applicable.

TCO completion standard: Maintain altitude +/-100 ft, heading +/-10 deg, airspeed +/-10 kt, and rates +/-100 fpm while demonstrating increased VOR competency.

Instructor direction, the TCO, current aircraft documents, and current FAA publications control if any conflict exists.

STAGE I

Flight Lesson 10: VOR procedure proficiency

Dual local | Suggested 1.2 hr

Date: _____	Aircraft / Tail: _____	Instructor: _____
Airport / Route: _____	Avionics: [] GNS 430W [] GNX 375	Weather risk: L / M / H

Lesson focus: Turn VOR orientation and calculations into a smooth, low-workload instrument procedure.

STUDY BEFORE ARRIVAL

- Complete the Lesson 9 assignment: TCO Ground Lesson 4, assigned Jeppesen chapters, and AIM VOR/DME/GNSS/RNAV material.
- Review VOR orientation, tracking, time-distance, intersections, and equipment-check requirements.

CHAIR-FLY BEFORE DISPATCH

- Fly three paper scenarios: inbound radial, outbound radial, and intersection identification.
- Brief the expected CDI movement before each intercept.
- Calculate time/distance, then compare it with a separate approved source.

BE READY TO EXPLAIN

- A repeatable intercept-track-correct-monitor sequence.
- How to detect reverse sensing, wrong source selection, or an incorrect OBS course.
- When station passage or signal unreliability requires a different navigation cross-check.

AVIONICS PREPARATION

- GNS 430W: practice switching GPS/VLOC only at the planned point and verify the annunciation.
- GNX 375: keep RNAV data separate from the selected VOR/LOC source and cross-check both deliberately.

SELF-CHECK: ANSWER WITHOUT NOTES

- What exact CDI movement do you expect on rollout?
- How would you diagnose a needle moving opposite your expectation?
- What is your wind-correction strategy after capture?

READY-FOR-FLIGHT GATE

- [] I can state the lesson objective and applicable standard.
- [] I answered the self-check questions without guessing.
- [] I chair-flew the critical sequence without instructor prompting.
- [] I reviewed the current weather, charts, NOTAMs, aircraft documents, and instructor assignment as applicable.

TCO completion standard: Demonstrate increased proficiency and understanding in all assigned VOR procedures.

Instructor direction, the TCO, current aircraft documents, and current FAA publications control if any conflict exists.

STAGE I

Flight Lesson 11: Localizer front-course and back-course tracking

Dual local | Suggested 1.2 hr

Date: _____	Aircraft / Tail: _____	Instructor: _____
Airport / Route: _____	Avionics: [] GNS 430W [] GNX 375	Weather risk: L / M / H

Lesson focus: Interpret localizer sensitivity and sensing while maintaining precise heading and altitude.

STUDY BEFORE ARRIVAL

- Complete the Lesson 10 assignment: TCO Ground Lesson 4 plus VOR equipment checks and calculations.
- Current AIM Chapter 1 material on localizer, ILS, GPS/GNSS, WAAS, RNAV, and approved IFR navigation systems.

BE READY TO EXPLAIN

- A localizer is more sensitive than a VOR; small heading changes are required near course centerline.
- Expected sensing for the installed indicator during front-course and back-course operations.
- Back-course procedures are flown only when published/authorized and supported by installed equipment.

CHAIR-FLY BEFORE DISPATCH

- Brief localizer frequency, inbound course, source, identifier, intercept, sensing, and missed procedure.
- Intercept with a controlled angle, reduce correction near centerline, then establish wind correction.
- For back course, state the expected sensing before moving the controls.

AVIONICS PREPARATION

- GNS 430W: select/verify VLOC and identify the localizer; GPS guidance is not the localizer signal.
- GNX 375: use the separate installed NAV receiver and indicator for localizer work.

SELF-CHECK: ANSWER WITHOUT NOTES

- Why does a localizer require smaller corrections than a VOR?
- How will you confirm the correct source and identifier?
- What sensing do you expect on the planned back-course setup?

READY-FOR-FLIGHT GATE

- [] I can state the lesson objective and applicable standard.
- [] I answered the self-check questions without guessing.
- [] I chair-flew the critical sequence without instructor prompting.
- [] I reviewed the current weather, charts, NOTAMS, aircraft documents, and instructor assignment as applicable.

TCO completion standard: Maintain heading +/-10 deg and altitude +/-100 ft while beginning to understand localizer tracking.

Instructor direction, the TCO, current aircraft documents, and current FAA publications control if any conflict exists.

STAGE I

Flight Lesson 12: Stage I preparation: full panel, partial panel, and navigation

Dual local | Suggested 1.5 hr

Date: _____	Aircraft / Tail: _____	Instructor: _____
Airport / Route: _____	Avionics: [] GNS 430W [] GNX 375	Weather risk: L / M / H

Lesson focus: Integrate attitude control, emergencies, VOR, and localizer tracking before the Stage I check.

STUDY BEFORE ARRIVAL

- Complete the Lesson 11 assignment: TCO Ground Lesson 4 and current AIM localizer/ILS/GNSS material.
- Review TCO Ground Lessons 2, 3, and 4; aircraft systems, partial panel, VOR/localizer tracking, and navigation limitations.

BE READY TO EXPLAIN

- Your most common altitude, heading, airspeed, and scan errors and how you will correct them.
- Failure indications and the alternate scan for the assigned aircraft.
- VOR and localizer source-selection, orientation, intercept, tracking, and limitations.

CHAIR-FLY BEFORE DISPATCH

- Run a complete Stage I sequence without notes: full panel, failure recognition, partial panel, unusual attitudes, and navigation.
- Verbalize every configuration, power, trim, and level-off transition.
- Brief abort/discontinue criteria if workload or aircraft control becomes unacceptable.

AVIONICS PREPARATION

- Set the navigator and NAV receiver for the expected sequence before takeoff when practical.
- Practice verifying the source after every frequency/course/procedure change.

SELF-CHECK: ANSWER WITHOUT NOTES

- Which Stage I task is currently least stable, and why?
- What is your exact response to a suspected instrument failure?
- Can you explain each CDI indication before the instructor asks?

READY-FOR-FLIGHT GATE

- [] I can state the lesson objective and applicable standard.
- [] I answered the self-check questions without guessing.
- [] I chair-flew the critical sequence without instructor prompting.
- [] I reviewed the current weather, charts, NOTAMS, aircraft documents, and instructor assignment as applicable.

TCO completion standard: Full/partial panel: altitude +/-100 ft, heading +/-10 deg, airspeed +/-10 kt, and rates +/-100 fpm; accurate VOR orientation and correct stall/unusual-attitude recoveries.

Instructor direction, the TCO, current aircraft documents, and current FAA publications control if any conflict exists.

STAGE I CHECK

Flight Lesson 13: Stage I check: attitude instrument flight and navigation

Dual stage check | Suggested 1.5 hr

Date: _____	Aircraft / Tail: _____	Instructor: _____
Airport / Route: _____	Avionics: [] GNS 430W [] GNX 375	Weather risk: L / M / H

Lesson focus: Demonstrate independent, repeatable control and navigation to a designated check instructor.

STUDY BEFORE ARRIVAL

- Complete the Lesson 12 assignment: TCO Ground Lessons 2, 3, and 4 plus aircraft systems, partial-panel procedures, and VOR/localizer tracking.
- Review all Stage I instructor comments and correct every unresolved deficiency before dispatch.

CHAIR-FLY BEFORE DISPATCH

- Complete a no-notes oral rehearsal of the Stage I profile.
- Chair-fly one full-panel and one partial-panel unusual-attitude recovery.
- Draw and brief a VOR intercept plus localizer intercept from an assigned position.

BE READY TO EXPLAIN

- The evaluation sequence, applicable tolerances, and personal correction plan.
- How to maintain situational awareness while responding to a simulated failure.
- How to recognize and correct navigation setup errors without prompting.

AVIONICS PREPARATION

- Verify current data, source selection, identifiers, and required navigation checks before flight.
- Use only installed/approved functions; explain any limitation that changes the planned task.

SELF-CHECK: ANSWER WITHOUT NOTES

- Can you state the Stage I tolerances from memory?
- What will you do if one task begins outside tolerance?
- What evidence confirms the selected navigation source is correct?

READY-FOR-FLIGHT GATE

- [] I can state the lesson objective and applicable standard.
- [] I answered the self-check questions without guessing.
- [] I chair-flew the critical sequence without instructor prompting.
- [] I reviewed the current weather, charts, NOTAMs, aircraft documents, and instructor assignment as applicable.

TCO completion standard: Accurate VOR orientation/tracking and correct stall/unusual-attitude recoveries; maintain altitude +/-100 ft, heading +/-10 deg, airspeed +/-10 kt, and rates +/-100 fpm.

Instructor direction, the TCO, current aircraft documents, and current FAA publications control if any conflict exists.

STAGE II

Flight Lesson 14: VOR holding: standard and nonstandard

Dual local | Suggested 1.2 hr

Date: _____	Aircraft / Tail: _____	Instructor: _____
Airport / Route: _____	Avionics: [] GNS 430W [] GNX 375	Weather risk: L / M / H

Lesson focus: Maintain orientation from clearance receipt through entry, wind correction, timing, and exit.

STUDY BEFORE ARRIVAL

- Complete the Lesson 13 assignment: TCO Ground Lesson 12.
- Current AIM 5-3-8: standard/nonstandard holds, entries, timing, leg length, speed, wind correction, EFC, and RNAV considerations.

CHAIR-FLY BEFORE DISPATCH

- Copy three holds, draw each, select an entry, and brief first-turn actions.
- Run the five-T style setup: turn, time, twist, throttle, talk - adapted to aircraft SOP.
- Apply triple-drift outbound as a starting technique, then refine based on results.

BE READY TO EXPLAIN

- How to copy and interpret a holding clearance using a consistent format.
- Standard versus nonstandard turn direction and how to choose a safe entry.
- Timing/leg-length rules, speed limits, wind correction, EFC, and fuel implications.

AVIONICS PREPARATION

- GNS 430W/GNX 375: load or create only the hold supported by the installed software and AFMS; verify waypoint, course, turns, leg, and SUSP/OBS state.
- If using raw VOR, verify the separate VLOC/NAV source and course before entry.

SELF-CHECK: ANSWER WITHOUT NOTES

- What are the five elements you must read back in a hold clearance?
- Which entry will you use, and what makes it appropriate?
- How will you adjust outbound timing for wind?

READY-FOR-FLIGHT GATE

- [] I can state the lesson objective and applicable standard.
- [] I answered the self-check questions without guessing.
- [] I chair-flew the critical sequence without instructor prompting.
- [] I reviewed the current weather, charts, NOTAMs, aircraft documents, and instructor assignment as applicable.

TCO completion standard: Show basic understanding, maintain orientation, and execute standard/nonstandard VOR holding procedures correctly.

Instructor direction, the TCO, current aircraft documents, and current FAA publications control if any conflict exists.

STAGE II

Flight Lesson 15: VOR and localizer holding

Dual local | Suggested 1.2 hr

Date: _____	Aircraft / Tail: _____	Instructor: _____
Airport / Route: _____	Avionics: ☐ GNS 430W ☐ GNX 375	Weather risk: L / M / H

Lesson focus: Increase VOR holding proficiency and transfer the same disciplined process to localizer holding.

STUDY BEFORE ARRIVAL

- Complete the Lesson 14 assignment: TCO Ground Lesson 12 and current AIM 5-3-8.
- TCO Ground Lesson 15 and AIM approach-clearance, course-reversal, and hold-in-lieu material.

CHAIR-FLY BEFORE DISPATCH

- Brief one standard and one nonstandard VOR hold from clearance through exit.
- Brief a localizer hold, including source, identifier, course, sensing, and protected side.
- State how you will react to an amended hold or revised EFC.

BE READY TO EXPLAIN

- Why localizer sensitivity demands smaller intercept and wind-correction changes.
- The difference between holding, a procedure turn, and a hold-in-lieu-of-procedure-turn.
- When ATC clearance or chart notes remove or require a course reversal.

AVIONICS PREPARATION

- GNS 430W: VLOC is required for raw localizer; verify source and identifier.
- GNX 375: use the separate localizer receiver/indicator; GNX 375 may support GPS holds but not localizer reception.

SELF-CHECK: ANSWER WITHOUT NOTES

- When is a course reversal not authorized or not required?
- How does localizer sensitivity change your control technique?
- What setup error is most likely during a hold-to-approach transition?

READY-FOR-FLIGHT GATE

- ☐ I can state the lesson objective and applicable standard.
- ☐ I answered the self-check questions without guessing.
- ☐ I chair-flew the critical sequence without instructor prompting.
- ☐ I reviewed the current weather, charts, NOTAMs, aircraft documents, and instructor assignment as applicable.

TCO completion standard: Correctly select and fly entries/procedures for standard and nonstandard VOR holds and demonstrate basic localizer-holding ability.

Instructor direction, the TCO, current aircraft documents, and current FAA publications control if any conflict exists.

STAGE II

Flight Lesson 16: Nonstandard, DME, and intersection holding

Dual local | Suggested 1.2 hr

Date: _____	Aircraft / Tail: _____	Instructor: _____
Airport / Route: _____	Avionics: [] GNS 430W [] GNX 375	Weather risk: L / M / H

Lesson focus: Generalize the holding process to different fixes, turn directions, and distance-based legs.

STUDY BEFORE ARRIVAL

- Complete the Lesson 15 assignment: TCO Ground Lessons 12 and 15; AIM holding and course-reversal material.
- TCO Ground Lesson 14 and applicable current approach charts for the planned holds.

CHAIR-FLY BEFORE DISPATCH

- Draw and brief a nonstandard localizer hold.
- Brief an intersection hold and prove how the fix will be identified.
- Brief a DME or RNAV hold, including distance/leg termination and sequencing state.

BE READY TO EXPLAIN

- How to identify an intersection or DME holding fix with the installed equipment.
- How DME/along-track distance changes leg management compared with timed legs.
- The equipment and database requirements for any RNAV-defined holding fix.

AVIONICS PREPARATION

- Load/verify the fix before accepting the hold; confirm waypoint identity, course, turn direction, leg, and source.
- If the navigator cannot build the clearance exactly, request clarification or use an approved manual method with the instructor.

SELF-CHECK: ANSWER WITHOUT NOTES

- How will you prove station/fix passage in this equipment configuration?
- Is the assigned leg timed, distance-based, or terminated by another event?
- What will cause automatic sequencing, and when must it be suspended?

READY-FOR-FLIGHT GATE

- [] I can state the lesson objective and applicable standard.
- [] I answered the self-check questions without guessing.
- [] I chair-flew the critical sequence without instructor prompting.
- [] I reviewed the current weather, charts, NOTAMs, aircraft documents, and instructor assignment as applicable.

TCO completion standard: Execute correct entries for intersection/other assigned holds; maintain altitude +/-200 ft and assigned airspeed +/-10 kt.

Instructor direction, the TCO, current aircraft documents, and current FAA publications control if any conflict exists.

STAGE II

Flight Lesson 17: Nonprecision approaches and missed-approach planning

Dual local | Suggested 1.2 hr

Date: _____	Aircraft / Tail: _____	Instructor: _____
Airport / Route: _____	Avionics: [] GNS 430W [] GNX 375	Weather risk: L / M / H

Lesson focus: Translate the approach chart into a stable sequence from initial segment through the missed approach.

STUDY BEFORE ARRIVAL

- Complete the Lesson 16 assignment: TCO Ground Lessons 12, 14, and 15 plus AIM holding and instrument-approach material.
- Review TCO Ground Lessons 16 and 18 as applicable; AIM 5-4-5 through 5-4-7 and 5-4-21.

BE READY TO EXPLAIN

- Chart title, navigation source, required equipment, minimums, stepdowns, MDA, MAP, and missed instructions.
- When an approach may be loaded, activated, joined by vectors, or flown from an IAF.
- The exact trigger and first actions for a missed approach.

CHAIR-FLY BEFORE DISPATCH

- Give a complete approach brief and identify every altitude constraint.
- Fly the initial, intermediate, and final segments on paper with configuration/power callouts.
- At the MAP: power, pitch, configuration, course, altitude, communicate, and verify sequencing.

AVIONICS PREPARATION

- 430W/GNX 375: load the procedure, verify airport/approach/transition, confirm CDI source and sensitivity, and know SUSP/OBS behavior at the missed.
- For VOR/localizer, use the installed NAV receiver; GNX 375 alone cannot receive those signals.

SELF-CHECK: ANSWER WITHOUT NOTES

- Where is the MAP and how is it identified?
- Which stepdown fixes are usable with today's equipment?
- What will the navigator do at the missed, and what must the pilot do?

READY-FOR-FLIGHT GATE

- [] I can state the lesson objective and applicable standard.
- [] I answered the self-check questions without guessing.
- [] I chair-flew the critical sequence without instructor prompting.
- [] I reviewed the current weather, charts, NOTAMs, aircraft documents, and instructor assignment as applicable.

TCO completion standard: Explain/use the chart, execute initial/intermediate/final segments to the MAP, and fly the published missed approach as applicable.

Instructor direction, the TCO, current aircraft documents, and current FAA publications control if any conflict exists.

STAGE II

Flight Lesson 18: Nonprecision approaches, circling, and VDP

Dual local | Suggested 1.2 hr

Date: _____	Aircraft / Tail: _____	Instructor: _____
Airport / Route: _____	Avionics: [] GNS 430W [] GNX 375	Weather risk: L / M / H

Lesson focus: Add circling judgment, visual descent points, and a disciplined transition from instruments to landing.

STUDY BEFORE ARRIVAL

- Complete the Lesson 17 assignment: TCO Ground Lessons 14, 15, 16, and 18 plus AIM 5-4-5 through 5-4-7 and 5-4-21.
- Review current charts, circling restrictions, airport layout, and aircraft category for the planned approaches.

CHAIR-FLY BEFORE DISPATCH

- Brief straight-in and circling options, including runway environment and missed plan.
- Call MDA leveling, VDP, visual references, stable descent, and missed-approach decision.
- Chair-fly circling while maintaining required visual contact and safe maneuvering.

BE READY TO EXPLAIN

- MDA, MAP, VDP, circling minima, aircraft category, protected area, and charted restrictions.
- A VDP is a planning aid; it does not authorize descent below MDA without required visual references.
- When to continue, circle, go missed, or reject an unstable visual maneuver.

AVIONICS PREPARATION

- Verify the approach mode and MAP; do not let a moving map substitute for outside visual references during circling.
- Know how to initiate the missed after a visual/circling maneuver without losing navigation awareness.

SELF-CHECK: ANSWER WITHOUT NOTES

- What determines the circling category for today's approach?
- What visual references are required to descend below MDA?
- Where will you go missed if visual contact is lost while circling?

READY-FOR-FLIGHT GATE

- [] I can state the lesson objective and applicable standard.
- [] I answered the self-check questions without guessing.
- [] I chair-flew the critical sequence without instructor prompting.
- [] I reviewed the current weather, charts, NOTAMs, aircraft documents, and instructor assignment as applicable.

TCO completion standard: Initial/intermediate segments within +/-200 ft; final heading +/-15 deg, airspeed +/-10 kt, and altitude no more than 100 ft above and never below MDA.

Instructor direction, the TCO, current aircraft documents, and current FAA publications control if any conflict exists.

STAGE II

Flight Lesson 19: Nonprecision approach proficiency and landing transition

Dual local | Suggested 1.5 hr

Date: _____	Aircraft / Tail: _____	Instructor: _____
Airport / Route: _____	Avionics: [] GNS 430W [] GNX 375	Weather risk: L / M / H

Lesson focus: Repeat the full nonprecision sequence until briefing, descent control, circling, landing, and missed actions are predictable.

STUDY BEFORE ARRIVAL

- Complete the Lesson 18 assignment: TCO Ground Lessons 14, 15, 16, and 18 plus AIM approach-chart, circling, VDP, and missed-approach material.
- Review AIM 5-4-5 through 5-4-7, 5-4-20, and 5-4-21 and the current chart for each planned procedure.

CHAIR-FLY BEFORE DISPATCH

- Calculate descent rate from groundspeed and altitude to lose.
- Brief two approaches with different MAP definitions and missed procedures.
- Rehearse a late runway change/circling instruction and a safe reject/go-missed decision.

BE READY TO EXPLAIN

- How to choose a descent rate that reaches MDA before the VDP without destabilizing the airplane.
- How to prevent an early descent, busting a stepdown, or descending below MDA.
- When a landing transition is no longer safe and a missed approach is required.

AVIONICS PREPARATION

- Verify procedure, transition, active leg, course, source, and sensitivity before the final approach fix.
- Practice missed-approach activation/sequencing on the ground using the installed unit's approved training mode or manual.

SELF-CHECK: ANSWER WITHOUT NOTES

- What descent rate will place you at MDA before the VDP?
- How is the MAP identified on each planned approach?
- What exact condition will trigger your missed approach?

READY-FOR-FLIGHT GATE

- [] I can state the lesson objective and applicable standard.
- [] I answered the self-check questions without guessing.
- [] I chair-flew the critical sequence without instructor prompting.
- [] I reviewed the current weather, charts, NOTAMs, aircraft documents, and instructor assignment as applicable.

TCO completion standard: Initial/intermediate segments within +/-200 ft; final heading +/-15 deg, airspeed +/-10 kt, and altitude no more than 100 ft above and never below MDA.

Instructor direction, the TCO, current aircraft documents, and current FAA publications control if any conflict exists.

STAGE II

Flight Lesson 20: ILS introduction and precision-approach control

Dual local | Suggested 1.5 hr

Date: _____	Aircraft / Tail: _____	Instructor: _____
Airport / Route: _____	Avionics: [] GNS 430W [] GNX 375	Weather risk: L / M / H

Lesson focus: Intercept and track localizer/glideslope with stabilized configuration, small corrections, and a pre-briefed missed approach.

STUDY BEFORE ARRIVAL

- Complete the Lesson 19 assignment: TCO Ground Lessons 14, 15, 16, and 18 plus current AIM approach material.
- TCO Ground Lessons 17 and 15; AIM Chapter 1 ILS/localizer and AIM Chapter 5 approach/minimums/missed material.

BE READY TO EXPLAIN

- ILS components, service-volume/monitoring considerations, localizer sensitivity, and glideslope intercept rules.
- DA, required visual references, stable-approach decision, and missed-approach initiation.
- Why glideslope should normally be intercepted at the published altitude from below.

CHAIR-FLY BEFORE DISPATCH

- Brief frequency, identifier, inbound course, intercept altitude, glideslope, DA, runway environment, and missed.
- Call localizer alive/capture, glideslope alive/capture, configuration, power, and stabilized descent.
- At DA: continue only with required visual references and a normal landing path; otherwise go missed.

AVIONICS PREPARATION

- GNS 430W: verify VLOC and localizer identification; do not confuse GPS course guidance with ILS reception.
- GNX 375: use the separate VOR/LOC/GS receiver and indicator; GNX 375 supplies GPS, not ILS signals.

SELF-CHECK: ANSWER WITHOUT NOTES

- Where and at what altitude will you intercept the glideslope?
- What are the required visual references at DA?
- What indicates a false or unreliable glideslope, and what will you do?

READY-FOR-FLIGHT GATE

- [] I can state the lesson objective and applicable standard.
- [] I answered the self-check questions without guessing.
- [] I chair-flew the critical sequence without instructor prompting.
- [] I reviewed the current weather, charts, NOTAMs, aircraft documents, and instructor assignment as applicable.

TCO completion standard: Demonstrate front/back-course knowledge and ILS glideslope bracketing using attitude/power changes to control airspeed and descent rate.

Instructor direction, the TCO, current aircraft documents, and current FAA publications control if any conflict exists.

STAGE II

Flight Lesson 21: Precision/nonprecision integration and partial-panel approaches

Dual local | Suggested 1.5 hr

Date: _____	Aircraft / Tail: _____	Instructor: _____
Airport / Route: _____	Avionics: [] GNS 430W [] GNX 375	Weather risk: L / M / H

Lesson focus: Manage ATC vectors, approach transitions, failures, and missed approaches without losing aircraft control or situational awareness.

STUDY BEFORE ARRIVAL

- Complete the Lesson 20 assignment: TCO Ground Lessons 17 and 15 plus current AIM ILS and approach material.
- TCO Ground Lessons 15, 17, 18, and 24; AIM approach/radar material and AIM Chapter 6 communications failure.

BE READY TO EXPLAIN

- How to accept, clarify, or decline a vector that creates an unstable intercept.
- ATC assistance available for navigation, surveillance, emergency, and no-gyro situations.
- How failure of a primary instrument changes approach choice, briefing, minima, and workload.

CHAIR-FLY BEFORE DISPATCH

- Copy vectors and clearances while maintaining a stable scan.
- Fly a partial-panel nonprecision approach and missed with explicit source/altitude checks.
- Practice an emergency request: aircraft ID, problem, intentions, position/altitude, assistance needed.

AVIONICS PREPARATION

- Know which functions remain after the simulated failure and whether any displayed track/attitude data are independent.
- Preload likely frequencies/procedures to reduce head-down time, then verify any ATC change before execution.

SELF-CHECK: ANSWER WITHOUT NOTES

- When should you decline or modify an ATC vector?
- What approach is safest with the simulated failure and current weather?
- What exact help will you request from ATC?

READY-FOR-FLIGHT GATE

- [] I can state the lesson objective and applicable standard.
- [] I answered the self-check questions without guessing.
- [] I chair-flew the critical sequence without instructor prompting.
- [] I reviewed the current weather, charts, NOTAMs, aircraft documents, and instructor assignment as applicable.

TCO completion standard: ILS localizer/glideslope within less than full-scale deflection; nonprecision initial/intermediate altitude +/-200 ft; manage MDA without descending below applicable minimums.

Instructor direction, the TCO, current aircraft documents, and current FAA publications control if any conflict exists.

STAGE II

Flight Lesson 22: RNAV/LPV procedures and Stage II preparation

Dual local | Suggested 1.5 hr

Date: _____	Aircraft / Tail: _____	Instructor: _____
Airport / Route: _____	Avionics: [] GNS 430W [] GNX 375	Weather risk: L / M / H

Lesson focus: Integrate holds, conventional approaches, RNAV/LPV, missed approaches, partial panel, and emergency procedures.

STUDY BEFORE ARRIVAL

- Complete the Lesson 21 assignment: TCO Ground Lessons 15, 17, 18, and 24; AIM approach/radar/communications-failure material.
- Review TCO Ground Lessons 12, 15, 17, and 18 and current AIM instrument-approach/missed-approach guidance.

CHAIR-FLY BEFORE DISPATCH

- Load, verify, brief, and fly an RNAV approach from an assigned transition through the missed.
- Rehearse one hold, one ILS, one VOR/localizer, and one RNAV approach in a single oral profile.
- State the response to loss of integrity/approach capability before and after the final approach fix.

BE READY TO EXPLAIN

- RNAV line of minima: LPV, LNAV/VNAV, LNAV, and any equipment/temperature limitations shown on the chart or AFMS.
- How CDI sensitivity, annunciations, integrity alerts, and sequencing change during an RNAV approach.
- The difference between an approach with approved vertical guidance and an ILS signal.

AVIONICS PREPARATION

- 430W/GNX 375: verify approach type annunciation and CDI sensitivity; do not assume LPV will be available until displayed.
- Know the unit-specific steps for loading versus activating, vectors-to-final, leg activation, SUSP/OBS, and missed sequencing.

SELF-CHECK: ANSWER WITHOUT NOTES

- What minimums can you use if LPV downgrades before the FAF?
- What will you do if approach integrity is lost after the FAF?
- How will you confirm the active leg and proper sequencing?

READY-FOR-FLIGHT GATE

- [] I can state the lesson objective and applicable standard.
- [] I answered the self-check questions without guessing.
- [] I chair-flew the critical sequence without instructor prompting.
- [] I reviewed the current weather, charts, NOTAMs, aircraft documents, and instructor assignment as applicable.

TCO completion standard: Demonstrate proficiency in assigned holds, approaches, missed approaches, partial-panel procedures, and emergencies for the Stage II check.

Instructor direction, the TCO, current aircraft documents, and current FAA publications control if any conflict exists.

STAGE II CHECK

Flight Lesson 23: Stage II check: holds and instrument approaches

Dual stage check | Suggested 1.5 hr

Date: _____	Aircraft / Tail: _____	Instructor: _____
Airport / Route: _____	Avionics: [] GNS 430W [] GNX 375	Weather risk: L / M / H

Lesson focus: Demonstrate instrument-pilot proficiency across holds, precision/nonprecision approaches, circling, missed approaches, and partial panel.

STUDY BEFORE ARRIVAL

- Complete the Lesson 22 assignment: TCO Ground Lessons 12, 15, 17, and 18 plus current AIM approach/missed material.
- Review Ground Lessons 12, 14, 15, 16, 17, 18, and 24 and all unresolved instructor comments.

BE READY TO EXPLAIN

- Applicable ACS standards and risk-management expectations for every evaluated task.
- Which tasks require the GNS 430W/GNX 375 and which require the separate VOR/LOC/GS receiver.
- How to recognize an unstable approach or setup error early enough to correct or go missed.

CHAIR-FLY BEFORE DISPATCH

- Give complete briefs for the likely VOR/localizer, ILS, RNAV/LPV, and circling procedures.
- Rehearse a hold clearance, entry, wind correction, EFC, and approach transition.
- Rehearse partial-panel approach and missed-approach actions without prompts.

AVIONICS PREPARATION

- Prepare both unit-specific workflows from memory, but verify every entry against the current chart and display.
- Confirm databases, source, identifiers, active leg, mode annunciation, and missed sequencing.

SELF-CHECK: ANSWER WITHOUT NOTES

- Can you state the ACS standard for each planned task?
- What are the top three setup traps in today's avionics configuration?
- What condition will make you discontinue an approach?

READY-FOR-FLIGHT GATE

- [] I can state the lesson objective and applicable standard.
- [] I answered the self-check questions without guessing.
- [] I chair-flew the critical sequence without instructor prompting.
- [] I reviewed the current weather, charts, NOTAMs, aircraft documents, and instructor assignment as applicable.

TCO completion standard: Demonstrate instrument-pilot proficiency, consistent with the current Instrument Rating - Airplane ACS, in each listed hold and approach procedure.

Instructor direction, the TCO, current aircraft documents, and current FAA publications control if any conflict exists.

STAGE III

Flight Lesson 24: IFR cross-country planning and departure procedures

Dual cross-country | Suggested 2.0 hr

Date: _____	Aircraft / Tail: _____	Instructor: _____
Airport / Route: _____	Avionics: [] GNS 430W [] GNX 375	Weather risk: L / M / H

Lesson focus: Plan and begin an IFR trip while managing weather, aircraft capability, clearances, reroutes, and en-route emergencies.

STUDY BEFORE ARRIVAL

- Complete the Lesson 23 assignment: approach/hold/emergency review and the required IFR cross-country briefing.
- TCO Ground Lessons 10, 11, 13, 20, 23, 24, and 25; AIM Chapter 5 Sections 1-4 and Chapter 7 Section 1.

BE READY TO EXPLAIN

- Route, MEA/MOCA/OROCA context, departure options, alternates, fuel, performance, weather, NOTAMs, and escape plans.
- How to copy, read back, load, verify, and fly an IFR clearance or amended route.
- Loss-of-communications, icing, turbulence, low fuel, instrument/equipment failure, and engine-failure priorities.

CHAIR-FLY BEFORE DISPATCH

- Give a complete weather/route/alternate/fuel risk brief and identify no-go triggers.
- Copy a full clearance, compare it with the chart, load it, and perform a point-by-point verification.
- Rehearse departure, first reroute, arrival, approach, missed, and IFR cancellation.

AVIONICS PREPARATION

- Build the route on the ground; verify every fix and airway transition before accepting the flight plan.
- Know how to edit a clearance safely, restore direct-to/leg sequencing, and avoid activating the wrong leg.

SELF-CHECK: ANSWER WITHOUT NOTES

- What are today's three most important IFR risks and mitigations?
- Is the aircraft, navigator database, and required equipment legal for every planned segment?
- Where will you divert if weather, fuel, or equipment worsens?

READY-FOR-FLIGHT GATE

- [] I can state the lesson objective and applicable standard.
- [] I answered the self-check questions without guessing.
- [] I chair-flew the critical sequence without instructor prompting.
- [] I reviewed the current weather, charts, NOTAMs, aircraft documents, and instructor assignment as applicable.

TCO completion standard: Show knowledge of cross-country planning, IFR filing/clearances, and a basic understanding of assigned simulated emergency procedures.

Instructor direction, the TCO, current aircraft documents, and current FAA publications control if any conflict exists.

STAGE III

Flight Lesson 25: IFR cross-country execution beyond 50 NM

Dual cross-country | Suggested 2.0 hr

Date: _____	Aircraft / Tail: _____	Instructor: _____
Airport / Route: _____	Avionics: [] GNS 430W [] GNX 375	Weather risk: L / M / H

Lesson focus: Execute departure, en route, holding, arrival, approach, and emergency procedures on a complete IFR trip.

STUDY BEFORE ARRIVAL

- Complete the Lesson 24 assignment: TCO Ground Lessons 10, 11, 13, 20, 23, 24, and 25 plus applicable AIM chapters.
- Review 14 CFR 91.167, 91.169, 91.173, 91.175, and 91.185; current weather, charts, NOTAMs, and assigned route.

BE READY TO EXPLAIN

- Fuel requirements, alternate requirements, IFR flight-plan/clearance rules, approach descent rules, and lost communications.
- How changing winds/weather affect fuel reserve, alternate viability, and approach selection.
- When to request delay vectors, a hold, a different approach, or a diversion.

CHAIR-FLY BEFORE DISPATCH

- Present the complete dispatch package and an updated go/no-go decision.
- Rehearse clearance pickup, departure, en-route checks, arrival, STAR if assigned, approach, and cancellation.
- Run one weather deterioration and one equipment-failure diversion scenario.

AVIONICS PREPARATION

- Enter and independently verify the route, including any airway, direct, and arrival transitions.
- Prepare likely approaches but do not activate one until appropriate; verify the active leg after every amendment.

SELF-CHECK: ANSWER WITHOUT NOTES

- Does the selected alternate legally qualify, and is it operationally smart?
- At what fuel state will you divert rather than continue?
- What changes if ATC gives a reroute during high workload?

READY-FOR-FLIGHT GATE

- [] I can state the lesson objective and applicable standard.
- [] I answered the self-check questions without guessing.
- [] I chair-flew the critical sequence without instructor prompting.
- [] I reviewed the current weather, charts, NOTAMs, aircraft documents, and instructor assignment as applicable.

TCO completion standard: Show knowledge of IFR cross-country planning, filing, and clearances and a basic understanding of simulated emergency procedures.

Instructor direction, the TCO, current aircraft documents, and current FAA publications control if any conflict exists.

STAGE III

Flight Lesson 26: Required long IFR cross-country

Dual long cross-country | Suggested 3.0 hr

Date: _____	Aircraft / Tail: _____	Instructor: _____
Airport / Route: _____	Avionics: [] GNS 430W [] GNX 375	Weather risk: L / M / H

Lesson focus: Plan and command a qualifying long IFR cross-country while demonstrating mature decisions, cockpit management, and ATC compliance.

STUDY BEFORE ARRIVAL

- Complete the Lesson 25 assignment: TCO Ground Lesson 25 plus Ground Lessons 10, 11, 13, and 20-24 as applicable.
- Appendix C route requirements; 14 CFR Part 141 Appendix C and 14 CFR 91.167, 91.169, 91.173, 91.175, and 91.185.

BE READY TO EXPLAIN

- Qualifying route: at least 250 NM along airways/ATC routing, one straight-line airport segment of at least 100 NM, an approach at each airport, and three different kinds of approaches using navigation systems.
- Fuel/weather/alternate/aircraft-performance margins for the entire route, not only departure.
- How to manage clearances, ETE/ETA, holds, arrivals, emergencies, workload, and diversions as pilot in command of the operation.

CHAIR-FLY BEFORE DISPATCH

- Defend the route against every qualifying requirement and identify evidence that will be recorded.
- Brief the entire flight by phase, including threats, decision points, fuel gates, alternates, and missed approaches.
- Run lost communications, icing, low fuel, instrument failure, and engine-failure scenarios at the least convenient points.

AVIONICS PREPARATION

- Build/verify all legs and procedures before departure; identify which approach uses GPS and which requires VOR/LOC/GS equipment.
- Carry an avionics recovery plan for incorrect sequencing, loss of integrity, database issue, or unit failure.

SELF-CHECK: ANSWER WITHOUT NOTES

- Show exactly how the planned route satisfies every long-cross-country requirement.
- What are the fuel decision points and diversion triggers?
- Which equipment failure would invalidate one of the planned approaches?

READY-FOR-FLIGHT GATE

- [] I can state the lesson objective and applicable standard.
- [] I answered the self-check questions without guessing.
- [] I chair-flew the critical sequence without instructor prompting.
- [] I reviewed the current weather, charts, NOTAMs, aircraft documents, and instructor assignment as applicable.

TCO completion standard: Demonstrate thorough cross-country/emergency knowledge, command of the aircraft, sound judgment, and accurate compliance with ATC procedures and clearances.

Instructor direction, the TCO, current aircraft documents, and current FAA publications control if any conflict exists.

STAGE III CHECK

Flight Lesson 27: Stage III check: IFR cross-country proficiency

Dual cross-country check | Suggested 2.0 hr

Date: _____	Aircraft / Tail: _____	Instructor: _____
Airport / Route: _____	Avionics: [] GNS 430W [] GNX 375	Weather risk: L / M / H

Lesson focus: Demonstrate complete IFR cross-country planning and execution at the instrument-pilot level.

STUDY BEFORE ARRIVAL

- Complete the Lesson 26 assignment: TCO Ground Lesson 25, Appendix C requirements, applicable regulations, and AIM Chapter 5.
- Review all stage feedback, weather analysis, ATC clearances, holds, approaches, circling, missed approaches, emergencies, and discrepancy reporting.

BE READY TO EXPLAIN

- The current ACS standards and risk-management elements for cross-country, approaches, communications, and emergencies.
- How to make and defend a go/no-go, continue/divert, and approach/missed decision.
- How to document a post-flight aircraft discrepancy accurately and promptly.

CHAIR-FLY BEFORE DISPATCH

- Deliver a check-quality dispatch brief with legal, operational, and personal minimums separated.
- Rehearse a full clearance, departure, reroute, arrival, approach, circle/land or missed, and cancellation.
- Run one communications failure and one systems/engine failure without instructor prompting.

AVIONICS PREPARATION

- Prepare the installed 430W or GNX 375 workflow and the separate NAV receiver workflow required by the route.
- Verify databases, sources, modes, active legs, approach annunciations, and missed sequencing.

SELF-CHECK: ANSWER WITHOUT NOTES

- Can you defend every dispatch decision using current information?
- What is the safest response to the most likely failure today?
- What remains between your present performance and practical-test readiness?

READY-FOR-FLIGHT GATE

- [] I can state the lesson objective and applicable standard.
- [] I answered the self-check questions without guessing.
- [] I chair-flew the critical sequence without instructor prompting.
- [] I reviewed the current weather, charts, NOTAMS, aircraft documents, and instructor assignment as applicable.

TCO completion standard: Demonstrate complete IFR cross-country understanding and perform IFR/simulated emergency procedures at the instrument-pilot level under the current ACS.

Instructor direction, the TCO, current aircraft documents, and current FAA publications control if any conflict exists.

END-OF-COURSE CHECK

Flight Lesson 28: End-of-course instrument proficiency check

Dual local check | Suggested 2.0 hr

Date: _____	Aircraft / Tail: _____	Instructor: _____
Airport / Route: _____	Avionics: [] GNS 430W [] GNX 375	Weather risk: L / M / H

Lesson focus: Demonstrate integrated instrument knowledge, risk management, aircraft control, navigation, approaches, and emergency response.

STUDY BEFORE ARRIVAL

- Complete the Lesson 27 assignment: review all ground and flight lessons and every unresolved stage-check item.
- Current Instrument Rating - Airplane ACS, assigned PA-28-140 POH/AFM and supplements, current charts/procedures, IFR regulations, and emergency procedures.

CHAIR-FLY BEFORE DISPATCH

- Run the expected check profile from preflight through shutdown without notes.
- Brief full/partial-panel maneuvers, holds, VOR/localizer, ILS, RNAV, circling, missed, emergencies, and cross-country decisions.
- Practice concise oral answers using rule/source, application to today's flight, and risk control.

BE READY TO EXPLAIN

- Applicable ACS knowledge, risk, and skill standards for every planned task.
- Aircraft systems, limitations, airworthiness, performance, and avionics limitations for the exact tail number.
- Personal weak areas and the specific correction strategy for each.

AVIONICS PREPARATION

- Demonstrate approved, aircraft-specific workflows for the installed GNS 430W or GNX 375 and any separate NAV receiver.
- Be able to recover from wrong source, wrong leg, suspend mode, integrity loss, database issue, and unit failure.

SELF-CHECK: ANSWER WITHOUT NOTES

- What task is least likely to meet ACS today, and what is your plan?
- What are the three biggest operational risks for today's profile?
- Can you explain every avionics mode and annunciation you expect to see?

READY-FOR-FLIGHT GATE

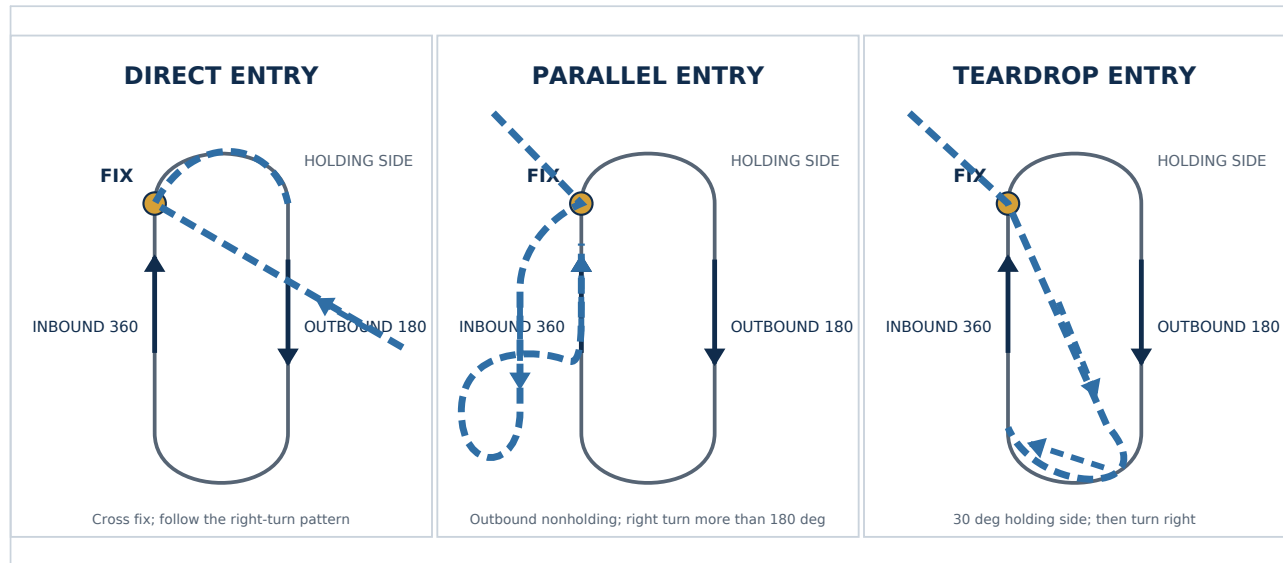
- [] I can state the lesson objective and applicable standard.
- [] I answered the self-check questions without guessing.
- [] I chair-flew the critical sequence without instructor prompting.
- [] I reviewed the current weather, charts, NOTAMs, aircraft documents, and instructor assignment as applicable.

TCO completion standard: Perform all IFR and pertinent simulated emergency procedures at the instrument level under the current Instrument Rating - Airplane ACS.

Instructor direction, the TCO, current aircraft documents, and current FAA publications control if any conflict exists.

Visual maneuver plate: holding entries

Three recommended entry depictions for the same standard right-turn hold. The holding pattern has an inbound course of 360 degrees; the racetrack is on the east (holding) side.



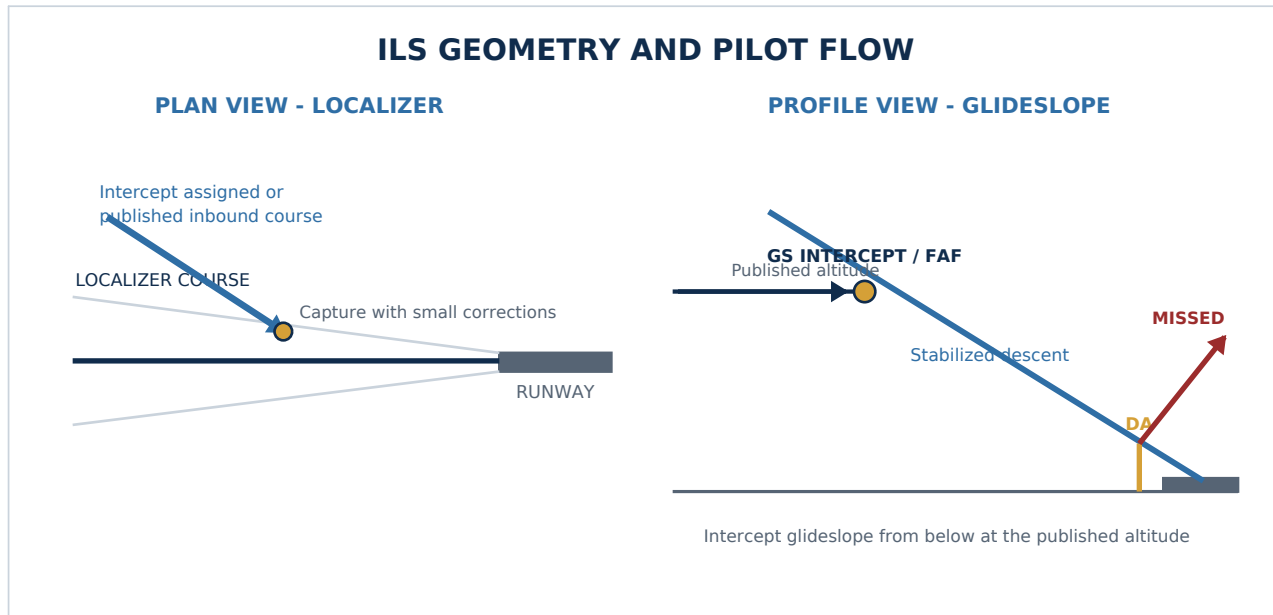
STUDENT USE

- [] Before choosing an entry, copy and draw the fix, inbound course, turn direction, leg length/time, altitude, speed, and EFC.
- [] Trace the assigned entry with your finger and state the heading, timing/distance, wind correction, and first inbound intercept.
- [] Treat entry sectors as recommended planning aids. Remain within protected airspace and use the method accepted by the instructor/check evaluator.

Training depiction only. Not to scale. Current chart, ATC clearance, aircraft documents, AIM, and instructor direction control.

Visual maneuver plate: ILS approach

The pilot first captures the localizer in plan view, then intercepts the glideslope from below at the published altitude. At DA, continue only when the regulatory visual-reference and normal-landing requirements are satisfied.



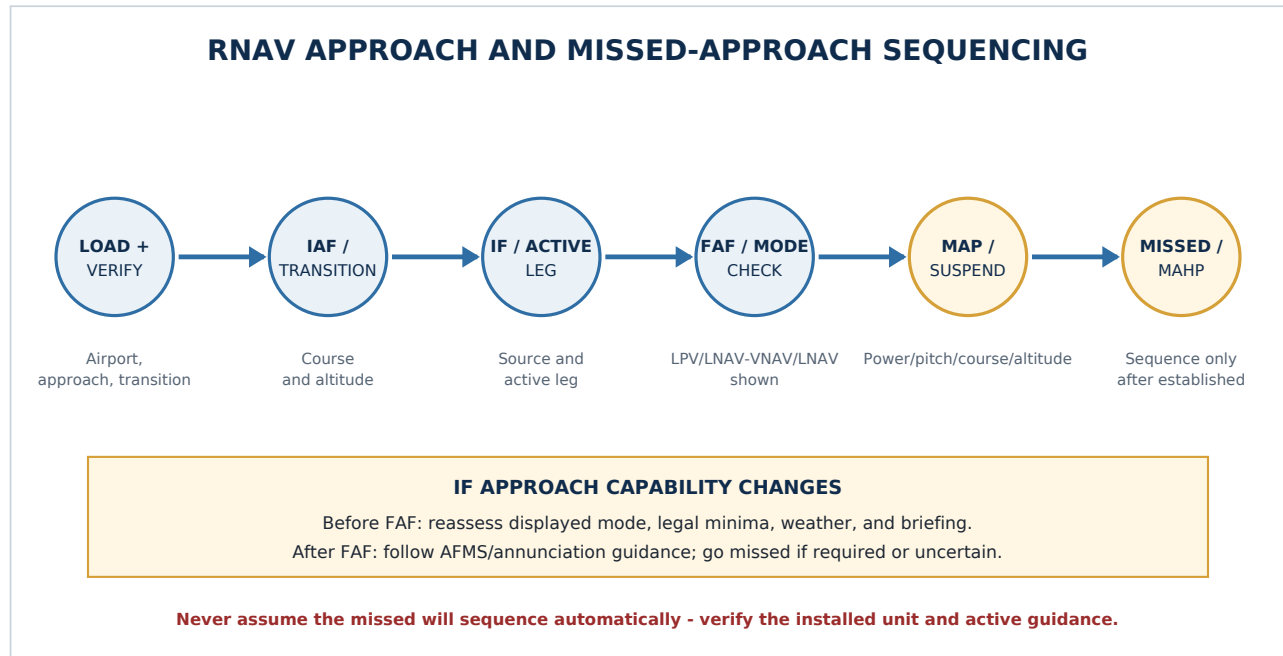
STUDENT USE

- [] Point to the localizer course, intercept, glideslope intercept/FAF, DA, runway, and missed-approach path.
- [] Say the expected source and annunciation at each point, then brief what would trigger a missed approach.
- [] Calculate the approximate target descent rate from expected groundspeed, then use small corrections to maintain the published path.

Training depiction only. Not to scale. Current chart, ATC clearance, aircraft documents, AIM, and instructor direction control.

Visual maneuver plate: RNAV approach sequencing

A correct RNAV setup is a sequence of independent checks. The pilot verifies the procedure and active guidance before each phase and never assumes the missed approach will sequence automatically.



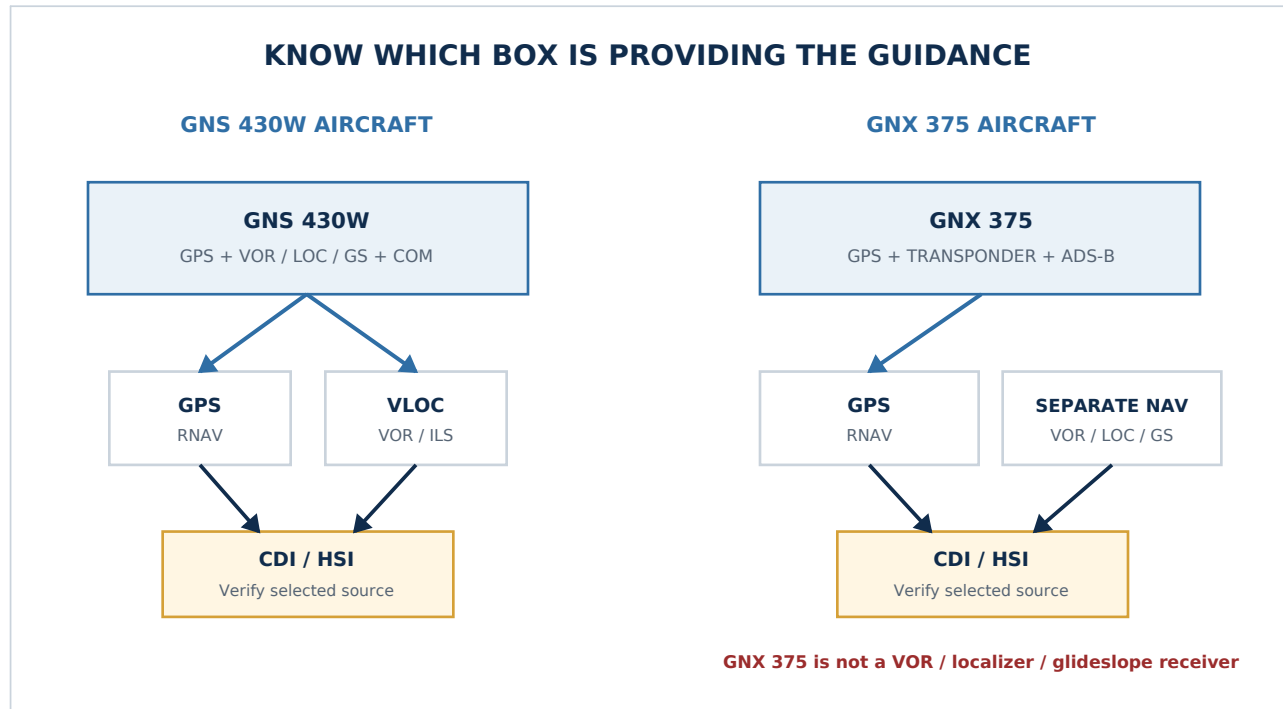
STUDENT USE

- [] Touch each node and state what must be verified before continuing.
- [] Practice a wrong-transition, wrong-active-leg, and suspended-sequencing recovery in an approved trainer or on the ground.
- [] State the plan if the displayed approach capability is lower than expected before the FAF or changes after the FAF.

Training depiction only. Not to scale. Current chart, ATC clearance, aircraft documents, AIM, and instructor direction control.

Visual maneuver plate: navigation-source architecture

The two approved navigator types do not provide the same capabilities. Correct source identification prevents a common and potentially dangerous setup error.



STUDENT USE

- [] For the assigned tail, point to the physical source selector, CDI/HSI annunciation, and each receiver that can drive it.
- [] For every planned procedure, name the required signal: GPS, VOR, localizer, or glideslope.
- [] Before intercepting, verbally confirm source, identifier when applicable, course, active leg, and expected needle behavior.

Training depiction only. Not to scale. Current chart, ATC clearance, aircraft documents, AIM, and instructor direction control.

Avionics preparation: GNS 430W vs. GNX 375

Use this as a preflight comparison only. The current aircraft-specific AFMS, approved cockpit equipment, and instructor procedures control exact operation.

Core capability	WAAS GPS navigator plus VHF COM and VOR/localizer/glideslope receiver.	WAAS GPS navigator plus Mode S ES transponder, ADS-B Out, and ADS-B In traffic/weather.
VOR / localizer / ILS	Use VLOC when raw VOR/LOC/GS guidance is required; verify identifier and CDI/HSI source.	Requires a separate installed VOR/LOC/GS receiver and indicator. GNX 375 does not receive those signals.
RNAV approach	Load/verify procedure and transition; confirm GPS source, active leg, sensitivity, and approach annunciation.	Load/verify procedure and transition; confirm active leg, sensitivity, integrity, and approach annunciation.
Missed approach	Know the unit/installation procedure for SUSP/OBS and sequencing after initiating the published missed.	Know the unit/installation procedure for suspended sequencing and activating the published missed.
Database	Check effective dates and whether the planned IFR operation permits use; verify every waypoint/procedure against current source data.	Check effective dates and whether the planned IFR operation permits use; verify every waypoint/procedure against current source data.
Traffic/weather	Depends on installed interfaces and subscriptions; treat displayed weather as advisory, not tactical weather avoidance.	ADS-B traffic/weather are advisory and limited by coverage, latency, equipment, and display conditions; not a substitute for see-and-avoid or tactical weather avoidance.
Common trap	Wrong GPS/VLOC source, wrong procedure/transition, wrong active leg, or misunderstanding SUSP/OBS.	Treating the unit as a VOR/ILS receiver, wrong active leg, wrong approach mode, or misunderstanding suspended sequencing.

AVIONICS SETUP CHALLENGE

- [] Program the instructor-assigned route/procedure on the ground or in an approved trainer.
- [] Point to and explain: source, active leg, desired track/course, integrity/approach mode, and sequencing state.
- [] Create one setup error intentionally in the trainer, identify it, and recover without rushing.
- [] State what navigation capability remains after loss of the navigator or separate NAV receiver.

Instrument flight readiness brief

Use this one-page prompt to brief the instructor before dispatch. Keep the answer concise, current, and tied to the exact aircraft and lesson.

1. Lesson

Lesson number, objective, planned maneuvers/procedures, TCO completion standard, prior deficiency.

Notes: _____

2. Pilot

IMSAFE, recency/eligibility as applicable, personal minimums, workload/fatigue risk.

Notes: _____

3. Aircraft

Tail number, airworthiness/inspection status, fuel/oil, weight and balance, performance, discrepancies, installed equipment.

Notes: _____

4. Weather

Ceilings/visibility, winds, convective/icing/turbulence risk, trends, NOTAMs, alternate and escape options.

Notes: _____

5. Route

Clearance expectation, departure, en-route altitude/terrain, arrivals, approaches, missed approaches, fuel gates, diversion points.

Notes: _____

6. Avionics

Unit, database status, source, active leg, frequencies, CDI/HSI mode, approach mode, sequencing, failure/recovery plan.

Notes: _____

7. Threats

Three highest risks today, specific mitigation for each, and a clear discontinue/go-missed/divert trigger.

Notes: _____

Source and revision controls

Source snapshot verified August 23, 2026. This guide paraphrases and organizes source material for study; it does not reproduce or replace the controlling documents.

Course source	Splendid Aviation Instrument Rating - Airplane Training Course Outline, Revision 0, July 1, 2026, supplied by Splendid Aviation.
FAA ACS	Instrument Rating - Airplane Airman Certification Standards, FAA-S-ACS-8C .
FAA AIM	Current Aeronautical Information Manual ; the source review used Change 3 dated July 9, 2026.
FAA handbooks	FAA aviation handbooks , including the Instrument Flying Handbook and Instrument Procedures Handbook.
Federal regulations	Current Title 14, Code of Federal Regulations , including the sections assigned by the TCO.
GNS 430W	Garmin 400W Series Pilot's Guide and Reference, 190-00356-00 Rev K .
GNX 375	Garmin GNX 375 Pilot's Guide, 190-02488-01 Rev C ; verify the installed software and AFMS before using detailed procedures.
Aircraft	The current POH/AFM, aircraft-specific AFMS/supplements, equipment list, weight and balance, placards, maintenance status, and Splendid Aviation checklists/SOPs for the assigned PA-28-140.

DOCUMENT CONTROL

- Content owner: Chief Instructor or designated instrument-program lead.
- Review before release, after any TCO/SOP/aircraft/avionics change, and at least quarterly.
- Verify FAA/eCFR/AIM and Garmin source revisions monthly; record material changes in a source register.
- Remove or quarantine any aircraft-specific statement that cannot be traced to the current tail-number documents.
- This guide does not establish FAA approval, course credit, or aircraft airworthiness. Use the regulatory basis and approved documents in effect for the student's enrollment and flight.

Instructor approval for student use: _____ Date: _____

Next scheduled review: _____ Supersedes: New document