

PRIVATE PILOT GROUND SCHOOL

MODULE 3-R — PHASE 3 CUMULATIVE REVIEW

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FACTS TO REMEMBER

KNOW THESE COLD

- Task priority in any abnormal situation is aviate, navigate, communicate — in that order.
Source: AFH ch. 18; PHAK ch. 2
- Situational awareness is an accurate picture of what is happening now and what happens next; distraction and fixation are its two main killers.
Source: PHAK ch. 2
- A student pilot may not fly solo until every requirement of 61.87 is met.
*Source: 61.87(a) eCFR**
- "Solo flight" means flight time when the student pilot is the sole occupant of the aircraft.
*Source: 61.87(a) eCFR**
- Before solo, a student must show satisfactory knowledge on a written knowledge test — the pre-solo exam.
*Source: 61.87(b) eCFR**
- The pre-solo test must cover the applicable sections of parts 61 and 91.
*Source: 61.87(b)(1)(i) eCFR**
- The pre-solo test must cover airspace rules and procedures for the airport where the solo will be flown.
*Source: 61.87(b)(1)(ii) eCFR**
- The pre-solo test must cover the flight characteristics and operational limitations of the make and model to be flown.
*Source: 61.87(b)(1)(iii) eCFR**
- The student's own authorized instructor administers the pre-solo test.
*Source: 61.87(b)(2)(i) eCFR**
- The instructor must review every incorrect answer with the student before authorizing solo.
*Source: 61.87(b)(2)(ii) eCFR**
- Before solo, the student must have received and logged flight training in the 61.87(d) maneuvers for the make and model.
*Source: 61.87(c)(1) eCFR**
- Before solo, an authorized instructor must judge the student proficient and safe in those maneuvers, in the make and model (or a similar make and model).
*Source: 61.87(c)(2) eCFR**
- 61.87(d) lists 15 required pre-solo training areas for a single-engine airplane, from preflight preparation through go-arounds.
*Source: 61.87(d) eCFR**
- Pre-solo training includes stall entries from various attitudes and power settings, with recovery at the first indication and recovery from a full stall.
*Source: 61.87(d)(10) eCFR**
- Pre-solo training includes emergency procedures, equipment malfunctions, and approaches with simulated

engine failure.

*Source: 61.87(d)(11),(13) eCFR**

- Pre-solo training includes slips to a landing and go-arounds.

*Source: 61.87(d)(14),(15) eCFR**

- Solo flight requires a logbook endorsement for the specific make and model of aircraft to be flown.

*Source: 61.87(n) eCFR**

- The solo endorsement must come from an authorized instructor who gave training within the 90 days before the flight.

*Source: 61.87(n) eCFR**

- A solo endorsement for one make and model does not authorize solo flight in a different make and model.

*Source: 61.87(n) eCFR**

- Before any solo flight, the student confirms the solo endorsement is still inside its 90-day window — there is no grace period.

*Source: 61.87(n) eCFR**

- Night solo requires night training in takeoffs, approaches, landings, and go-arounds at the airport where the night solo will be flown.

*Source: 61.87(o)(1) eCFR**

- Night solo requires night navigation training in the vicinity of that airport.

*Source: 61.87(o)(2) eCFR**

- Night solo requires its own make-and-model endorsement, given by an instructor who provided the training within the preceding 90 days.

*Source: 61.87(o)(3) eCFR**

- No instructor may authorize a solo unless that instructor gave the student training in the make and model (or a similar make and model).

*Source: 61.87(p)(1) eCFR**

- The authorizing instructor must have determined the student proficient in the 61.87 maneuvers and procedures.

*Source: 61.87(p)(2) eCFR**

- The authorizing instructor must have determined the student proficient in the specific make and model to be flown.

*Source: 61.87(p)(3) eCFR**

- The solo endorsement stays current only while an authorized instructor updates the student's logbook every 90 days.

*Source: 61.87(p)(4) eCFR**

- A student pilot may not act as pilot in command with a passenger aboard.

*Source: 61.89(a)(1) eCFR**

- A student pilot may not carry property for compensation or hire.

*Source: 61.89(a)(2) eCFR**

- A student pilot may not fly for compensation or hire.

*Source: 61.89(a)(3) eCFR**

- A student pilot may not fly in furtherance of a business.

*Source: 61.89(a)(4) eCFR**

- A student pilot may not make international flights.

*Source: 61.89(a)(5) eCFR**

- Solo by day requires flight or surface visibility of at least 3 statute miles.

*Source: 61.89(a)(6) eCFR**

- Solo at night requires flight or surface visibility of at least 5 statute miles.

*Source: 61.89(a)(6) eCFR**

- The 61.89 visibility limits apply in flight, not just at takeoff — if visibility drops below them en route, the student must land or turn back.

*Source: 61.89(a)(6) eCFR**

- A student pilot may not fly when the flight cannot be made with visual reference to the surface.

*Source: 61.89(a)(7) eCFR**

- Climbing above a solid cloud layer on a solo flight is prohibited even in clear air, because surface reference is lost.

Source: 61.89(a)(7) eCFR; answer key item 27*

- Any limitation an authorized instructor writes in the student's logbook is binding — wind, ceiling, route, or anything else.

*Source: 61.89(a)(8) eCFR**

- A student pilot may not act as a required crewmember on an aircraft that requires more than one pilot.

*Source: 61.89(b) eCFR**

- The pre-solo exam gates the first solo lesson: it must be taken, graded, and every miss corrected with the instructor first.

Source: 61.87(b) eCFR; NA (gates L18, MODULES.md)*

- Schedule pressure never moves a solo gate: a lapsed 90-day endorsement or below-minimums weather ends the solo plan, whoever is waiting.

Source: 61.87(n), 61.89(a)(6) eCFR; NA*

- "Airworthy" is a two-part legal test: the aircraft conforms to its type design AND is in a condition for safe operation.

Source: 14 CFR 3.5(a) TB

- The owner or operator is primarily responsible for maintaining the aircraft in an airworthy condition.

*Source: 91.403(a) eCFR**

- The owner/operator's maintenance responsibility explicitly includes compliance with part 39, the airworthiness directives.

*Source: 91.403(a) eCFR**

- The pilot in command is responsible for determining whether the aircraft is in condition for safe flight.

*Source: 91.7(b) eCFR**

- The pilot in command must discontinue the flight when unairworthy mechanical, electrical, or structural conditions occur.

*Source: 91.7(b) eCFR**

- The owner must ensure maintenance personnel make the return-to-service entries in the records.

*Source: 91.405(b) eCFR**

- The owner must have discrepancies repaired between required inspections.

*Source: 91.405(a) eCFR**

- After any maintenance, the aircraft may not be operated until it has been approved for return to service by an authorized person.

*Source: 91.407(a)(1) eCFR**

- After any maintenance, the aircraft may not be operated until the required maintenance record entry has been

made.

*Source: 91.407(a)(2) eCFR**

- "Calendar month" arithmetic: a 12-calendar-month interval runs to the last day of the month, not to the anniversary date.

*Source: 91.409(a) eCFR**

- The 100-hour inspection is required only when carrying persons for hire, or when giving flight instruction for hire in an aircraft the instructor provides.

*Source: 91.409(b) eCFR**

- An annual inspection can substitute for a 100-hour inspection, but a 100-hour never substitutes for an annual.

*Source: 91.409(a),(b) eCFR**

- The 100-hour limit may be exceeded by up to 10 hours, and only while en route to a place where the inspection can be done.

*Source: 91.409(b) eCFR**

- Maintenance records come in two kinds: work/inspection records, and permanent status records.

*Source: 91.417(a)(1),(2) eCFR**

- Work and inspection records must be kept until the work is repeated or superseded, or for one year.

*Source: 91.417(b)(1) eCFR**

- Status records — total time, life-limited parts, overhaul times, inspection status, AD status, Form 337s — stay with the aircraft and transfer when it is sold.

*Source: 91.417(a)(2),(b)(2) eCFR**

- Maintenance records must be made available to the FAA or NTSB on request.

*Source: 91.417(c) eCFR**

- A maintenance record entry needs a description of the work, the completion date, and the signature, certificate number, and certificate kind of the person approving return to service.

*Source: 43.9(a) eCFR**

- Deciding an airplane is legal to fly requires reading its maintenance records — the cockpit documents alone cannot prove it.

Source: 91.409, 91.417 eCFR; TB*

- The transponder check every 24 calendar months applies to VFR aircraft too, whenever the transponder is used.

Source: 91.413 TB

- An airworthiness directive is a regulation: operating a product that does not comply violates part 39.

Source: 39.7 TB

- AD compliance is required at all times, not just at inspections — an aircraft can be inspection-legal and AD-unairworthy at the same time.

Source: AC 39-7D ¶11a TB

- ADs may be one-time or recurring; recurring ADs repeat at stated intervals of hours or calendar time.

Source: part 39; AC 39-7D TB

- A SAIB is non-regulatory, non-mandatory information — never a compliance requirement.

Source: FAA Order 8110.100B TB

- A special flight permit lets an aircraft that does not currently meet airworthiness requirements, but is capable of safe flight, fly to a place where repairs or storage can be done.

Source: 21.197(a) TB

- A private pilot may perform preventive maintenance on an aircraft they own or operate, as long as it is not

used under parts 121, 129, or 135.

*Source: 43.3(g) eCFR**

- The preventive maintenance list in part 43 Appendix A(c) is exclusive: if a task is not on the list, it is not preventive maintenance.

Source: 43 App. A(c) eCFR; AC 43-12A TB*

- Listed examples: tires, spark plugs, batteries, position and landing light bulbs, safety belts, prefabricated fuel lines, oil and fuel strainers/filter elements.

*Source: 43 App. A(c) eCFR**

- The pilot must log preventive maintenance: description of work, date, signature, and certificate kind and number.

Source: 43.9(a) eCFR; AC 43-12A TB*

- When equipment is found inoperative, the governing rule is 91.213 — 91.205 enters later, inside the process, never first.

Source: 91.213 eCFR; AC 91-67A TB*

- Three legal paths to fly with inoperative equipment: an approved MEL with letter of authorization, the 91.213(d) process, or a special flight permit.

Source: AC 91-67A TB

- 91.213(d) screen one: the item must not be part of the VFR-day type certification instruments and equipment.

*Source: 91.213(d)(2)(i) eCFR**

- 91.213(d) screen two: the item must not be indicated as required on the aircraft's equipment list or on the KOEL for the kind of flight.

*Source: 91.213(d)(2)(ii) eCFR**

- A KOEL lists which equipment is required for each kind of operation (day VFR, night VFR, IFR); many light aircraft have none.

Source: 91.213(d)(2)(ii) eCFR; TB*

- 91.213(d) screen three: the item must not be required by 91.205 or any other rule for the specific kind of flight being conducted.

*Source: 91.213(d)(2)(iii) eCFR**

- 91.213(d) screen four: the item must not be required to be operational by an airworthiness directive.

*Source: 91.213(d)(2)(iv) eCFR**

- Disposition: the item is either removed, the cockpit control placarded, and the work recorded — or deactivated and placarded "Inoperative."

*Source: 91.213(d)(3) eCFR**

- Final step: a certificated pilot or mechanic determines the inoperative item is not a hazard to the aircraft.

*Source: 91.213(d)(4) eCFR**

- Legal is not the same as safe: after the 91.213 paperwork, the PIC's hazard judgment and 91.7(b) still decide the flight.

*Source: 91.213(d)(4), 91.7(b) eCFR**

- The airworthiness certificate must be displayed at the cabin or cockpit entrance, legible to passengers or crew.

Source: 91.203(b) TB

- A standard airworthiness certificate stays valid only as long as maintenance is performed per parts 43 and 91 — its blank expiration is conditional, not eternal.

Source: 21.181(a)(1) TB

- Aircraft registration expires 7 years after the last day of the month it was issued (the old 3-year answer is stale).

Source: 47.40(a) TB

- Air pressure is how often and how hard air molecules strike a surface.

Source: NWS JetStream; AWH TC

- Warm air is less dense than cool air: in the open atmosphere, heated molecules move faster and spread farther apart.

Source: NWS JetStream TC

- Air density is determined by pressure, temperature, and humidity.

Source: NWS TC

- Humid air is less dense than dry air — a water molecule weighs less than the nitrogen or oxygen molecule it displaces.

Source: NWS; Dalton/Avogadro TC

- Any one of high, hot, or humid raises density altitude — all three are not required.

Source: TC (misconception #3)

- The atmosphere is about 78 percent nitrogen, 21 percent oxygen, and 1 percent other gases including water vapor.

Source: AWH ch. 2 TC

- Nearly all weather happens in the troposphere, the lowest layer.

Source: AWH TC

- Temperature normally falls with altitude at an average of about 2°C per 1,000 feet — the standard (environmental) lapse rate.

Source: AWH ch. 6 TC

- Rising air cools by expansion with no heat exchange — the adiabatic process that builds every cloud.

Source: NWS "How Clouds Form"; AWH TC

- Radiation fog: clear night, light wind, moist air — forms in low spots, burns off after sunrise.

Source: AWH ch. 18 TC

- Advection fog: moist air flowing over a cooler surface — needs wind, can persist for days and move onshore at night.

Source: AWH ch. 18 TC

- Upslope fog: moist air cooled adiabatically as terrain forces it up.

Source: AWH ch. 18 TC

- Precipitation-induced (frontal) fog forms when rain saturates the cold air beneath a front.

Source: AWH ch. 18 TC

- Smoke, dust, and blowing obscurations cut visibility fastest in stable air that holds them near the surface.

Source: AWH ch. 21 TC

- Never fly through volcanic ash — it destroys engines and abrades windscreens; avoid by wide margins.

Source: AWH TC

- Sinking air warms by compression, which is why descending air dries out.

Source: NWS; AWH TC

- Dry adiabatic lapse rate: about 3°C per 1,000 feet for unsaturated rising air.

Source: AWH ch. 6 TC

- Saturated rising air cools more slowly (roughly 1.2–3°C per 1,000 feet) because condensation releases latent

heat.

Source: AWH TC

- The environmental lapse rate is the measured temperature profile of the actual air — a different quantity from the adiabatic rates a parcel follows.

Source: AWH ch. 13; TC (misconception #2)

- Dewpoint is the temperature air must cool to for saturation — the real moisture number.

Source: NWS La Crosse; AWH TC

- The temperature–dewpoint spread predicts fog, cloud bases, and structural ice before they appear.

Source: AWH ch. 6/12 TC

- In a rising convective parcel the spread closes about 2.5°C per 1,000 feet, so cumulus bases sit near $(\text{spread} \div 2.5) \times 1,000$ feet.

Source: AWH ch. 6/12 TC

- Relative humidity changes with temperature even when moisture does not — dewpoint, not RH, is the measure to plan with.

Source: NWS La Crosse TC (misconception #7)

- Warmer air can contain more water vapor.

Source: NWS TC

- Cloud droplets form when vapor condenses onto condensation nuclei in cooling air.

Source: NWS TC

- Condensation releases latent heat, and that release is the fuel of thunderstorms.

Source: AWH TC

- Freezing rain at your altitude means a warmer-than-freezing layer is above you.

Source: AWH TC

- Frost forms by deposition: on clear, cold nights the surface cools below both freezing and the dewpoint.

Source: AWH ch. 20 TC

- All frost, ice, and snow must be removed from lift surfaces before flight.

Source: AWH ch. 20 TC

- Stability is the atmosphere's resistance to vertical motion — it either enhances or suppresses rising air.

Source: AWH 13.1 TC

- The parcel test: a lifted parcel that stays warmer than its surroundings keeps rising; one that turns cooler sinks back.

Source: NWS Parcel Theory; AWH 13.2 TC

- An inversion — temperature rising with height — marks strongly stable air.

Source: AWH 5.8.3 TC

- Inversions trap haze, smoke, and pollutants; expect smooth air but poor visibility beneath them.

Source: AWH TC

- Stable air signature: smooth, stratiform clouds, steady precipitation, poor visibility.

Source: AWH TC

- Unstable air signature: turbulence, cumuliform clouds, showery precipitation, good visibility.

Source: AWH TC

- A stagnant high-pressure system can mean bad VFR — the inversion under a high traps haze for days.

Source: TC (misconception #6)

- Uneven heating of the Earth's surface is the root driver of all weather.

Source: AWH TC

- Land heats and cools faster than water.

Source: AWH TC

- Sea breeze: daytime flow from the cool water toward the heated land.

Source: AWH TC

- Land breeze: nighttime flow from the cooled land toward the warmer water.

Source: AWH TC

- Clear, calm nights radiate surface heat away, setting up surface inversions and radiation fog.

Source: AWH TC

- Wind is air sliding from high pressure toward low pressure.

Source: NWS Origin of Wind TC

- Coriolis force turns moving air to the right in the Northern Hemisphere.

Source: NWS TC

- Above the friction layer, wind blows roughly parallel to the isobars.

Source: AWH TC

- Surface friction slows the wind and angles it across the isobars toward low pressure.

Source: AWH TC

- Northern Hemisphere circulation: clockwise and outward around highs, counterclockwise and inward around lows.

Source: NWS TC

- Air sinks in highs and dries out; air rises in lows and clouds up.

Source: NWS TC

- Closely spaced isobars mean a steep pressure gradient and strong wind.

Source: AWH TC

- Mountain waves form when strong wind crosses a ridge into stable air on the far side.

Source: AWH 16.2 TC

- Wind shear can occur at any altitude and in any direction — it is not only a thunderstorm product.

Source: AWH ch. 19 TC

- Frontal passage, thunderstorms, inversions, and terrain all produce low-level shear.

Source: AWH TC

- A shear that removes headwind on final costs airspeed and lift at the worst possible time.

Source: AWH TC

- An air mass takes on the temperature and moisture of the region it forms over.

Source: AWH 11 TC

- A front is the boundary zone between two air masses — a zone with depth, not a wall.

Source: AWH 11.3; TC (misconception #10)

- Frontal passage signs: wind shift, temperature change, and a pressure fall then rise.

Source: AWH 11.3 TC

- Cold front: steep and fast — a narrow band of showery, sometimes violent weather, then rapid clearing.

Source: AWH 11.3.2 TC

- Squall lines — solid lines of severe storms — can form ahead of fast cold fronts.

Source: AWH 11.3.2 TC

- Warm front: shallow and slow — widespread layered cloud and steady precipitation arriving far ahead of the surface front.

Source: AWH 11.3 TC

- Ahead of a warm front the clouds lower and thicken in sequence as the front approaches.

Source: PHAK cloud families TC (attribution caveat)

- Winter warm fronts are the freezing-rain factory: rain falls from the warm layer aloft into freezing air below.

Source: AWH TC

- Stationary front: little movement, prolonged weather along the boundary.

Source: AWH 11.3 TC

- Occluded front: a faster cold front overtakes a warm front and lifts it, mixing both fronts' weather.

Source: AWH 11.3.4 TC

- "Nimbo" in a cloud name means it is producing precipitation.

Source: AWH ch. 12 TC

- Cumulus forms read as instability; stratus forms read as stability.

Source: AWH TC

- Towering cumulus signals strong convective turbulence and possible storm development.

Source: AWH TC

- Turbulence has four causes: convective, mechanical, frontal, and wind shear.

Source: AWH ch. 19 TC

- Turbulence intensities are defined terms: light, moderate, severe, extreme.

Source: AWH 19.1 TC

- A thunderstorm needs three ingredients: moisture, instability, and a lifting action.

Source: NWS; AWH 22 TC

- Life cycle: cumulus stage (updrafts), mature stage (precipitation begins, updrafts and downdrafts together), dissipating stage (downdrafts).

Source: AWH 22.3 TC

- The mature stage is the most violent, and surface precipitation marks its start.

Source: AWH 22.3 TC

- Avoid severe storms by at least 20 miles, and do not fly between echoes less than 40 miles apart.

Source: AWH 22.8.2 TC

- Never fly under a thunderstorm or under its anvil.

Source: AWH 22.8.2 TC

- Never fly into a cloud mass containing embedded thunderstorms without airborne radar.

Source: AWH 22.8.2 TC

- A microburst is a small, intense downdraft — descent rates to 6,000 feet per minute.

Source: AWH TC

- Flying through a microburst swings you from headwind to tailwind — a 30-to-90-knot airspeed loss.

Source: AWH TC

- Structural icing needs two things: visible moisture and aircraft surface temperature at or below freezing.

Source: AC 91-74B TC

- Clear ice: large supercooled drops (freezing rain) spread before freezing — heavy, hard, hard to see.

Source: AC 91-74B; AWH TC

- Rime ice: small drops freeze on impact — rough, milky, builds on leading edges.

Source: AC 91-74B; AWH TC

- Freezing rain produces the fastest ice accumulation of any condition.

Source: AWH TC

- Carburetor ice is a warm-day hazard: most likely below about 70°F in humid air, possible up to 100°F — not a freezing-weather problem.

Source: PHAK ch. 7 TC (misconception #8)

- Fog is a cloud at the surface: visibility below 5/8 statute mile.

Source: AWH ch. 18 TC

- Fog rarely forms until the temperature–dewpoint spread closes to about 2°C or less.

Source: AWH TC

- The Aviation Weather Center is the product source; Leidos Flight Service is the briefing and consultation service; EFB apps aggregate both.

Source: AC 91-92; AIM 7-1-5 TC*

- A regulatory-compliant briefing does not require calling Flight Service — a documented self-briefing can comply.

Source: AIM 7-1-5a; AC 91-92 TC*

- Flight Watch and HIWAS no longer exist; today's inflight sources are FSS on 122.2, FIS-B, and ARTCC hazardous-weather broadcasts.

Source: AIM 7-1-5f, 7-1-8 TC*

- ARTCC broadcasts hazardous weather advisories on center frequencies; ask the controller for details.

Source: AIM 7-1-8 TC*

- A PIREP is the only direct observation of conditions aloft; UA marks routine, UUA marks urgent.

Source: AWH 24.5 TC

- PIREP decode runs on slash codes: /OV location, /TM time, /FL altitude, /TP type, /SK sky, /TA temperature, /WV wind, /TB turbulence, /IC icing.

Source: AWH 24.5 TC

- Pilots are expected to volunteer PIREPs — reporting unforecast conditions helps the NWS verify and fix forecasts.

Source: AWH 24.5.1; AIM 7-1-18b TC*

- AIRMETs advise of widespread conditions hazardous especially to VFR pilots and operators of sensitive aircraft.

Source: AWH ch. 26 TC

- AIRMET Sierra: IFR conditions and mountain obscuration.

Source: AWH ch. 26 TC

- AIRMET Tango: moderate turbulence and strong surface winds.

Source: AWH ch. 26 TC

- AIRMET Zulu: moderate icing and freezing level.

Source: AWH ch. 26 TC

- A SIGMET warns of non-convective conditions severe for all aircraft: severe icing, severe or extreme turbulence, dust or sandstorms, volcanic ash.

Source: AWH ch. 26 TC

- A Convective SIGMET covers severe thunderstorms, embedded thunderstorms, and lines of storms.

Source: AWH ch. 26 TC

- Any Convective SIGMET implies severe or greater turbulence, severe icing, and low-level wind shear.

Source: AWH (verbatim rule) TC

- The Graphical Forecasts for Aviation (GFA) is the interactive replacement for the old text Area Forecast over the CONUS.

Source: AWH TC

- The Surface Analysis Chart shows observed pressure systems and front positions — what is, not what will be.

Source: AWH 25.2.3 TC

- Prog charts show forecast front and pressure positions at future times.

Source: AWH ch. 25 TC

- Winds and Temperatures Aloft (FB): direction in tens of degrees TRUE, speed in knots, temperature in Celsius.

Source: AWH 27.2.1 TC

- FB blanks: no wind forecast within 1,500 feet of station elevation; no temperature within 2,500 feet.

Source: AWH 27.2.1 TC

- FB code 9900 means light and variable.

Source: AWH 27.2.1 TC

- The SPC Convective Outlook grades storm risk: TSTM, MRGL, SLGT, ENH, MDT, HIGH.

Source: SPC/NWS TC

- Scheduled TAFs are issued four times daily, every six hours.

Source: AWH TC

- An amended TAF (TAF AMD) supersedes and cancels the previous TAF — always check for the amendment.

Source: AWH (verbatim) TC

- Weather radar (NEXRAD) shows precipitation, not clouds — an empty radar picture is not proof of VMC.

Source: AWH 22.8.2 TC

- Satellite imagery shows clouds; radar shows precipitation — two different questions.

Source: AWH TC

- Datalink radar is always at least 7 to 8 minutes older than its time stamp.

Source: AC 00-63B (verbatim) TC

- Datalink weather is for broad strategic avoidance only — never for tactical storm penetration.

Source: AC 00-63B TC

- FIS-B is free over 978 UAT ADS-B In: METARs, TAFs, NEXRAD, AIRMETs, SIGMETs, NOTAMs, and more.

Source: AIM 7-1-9; AC 00-63B App A TC*

- FIS-B does not replace a preflight briefing.

Source: AC 00-63B TC

- An outlook briefing is for planning only — get a standard briefing closer to departure.

Source: AIM 7-1-5d; AC 91-92 8.1 TC*

- "VFR flight not recommended" is advisory — the final decision rests solely with the pilot, which is why it must be taken seriously, not outsourced.

Source: AIM 7-1-5b TC*

- A clean current METAR does not override a worsening TAF — the trend outranks the snapshot.

Source: TC (misconception #5; ratified trend element)

- Read improving versus deteriorating from the METAR sequence, the TAF's BECMG/TEMPO groups, front movement, and the closing spread.

Source: TC (ratified trend element)

- Every weather product has a valid time and an issue time — reading one without the other is reading fiction.
Source: AWH ch. 24–27 TC
- Class A runs from 18,000 feet MSL up to and including FL600.
Source: AIM 3-2-2*
- Class A operations must be IFR under an ATC clearance — there is no VFR in Class A.
*Source: 91.135 eCFR**
- Class A requires transponder with Mode C and ADS-B Out.
*Source: 91.135(c), 91.215, 91.225 eCFR**
- Class B: surface to about 10,000 feet MSL around the busiest airports, individually tailored in layered shelves.
Source: AIM 3-2-3*
- Class B entry requires an ATC clearance before entering.
*Source: 91.131(a)(1) eCFR**
- Two-way radio contact alone is not a Class B clearance — you need the words "cleared into Class Bravo."
Source: 91.131(a)(1); AIM 3-2-3*
- Class B equipment: two-way radio, transponder with Mode C, and ADS-B Out.
*Source: 91.131(c), (d) eCFR**
- To take off or land in Class B, the PIC must hold at least a private certificate — or a student/recreational/sport pilot with the 61.94/61.95 training and endorsement.
*Source: 91.131(b) eCFR**
- The Mode C veil: within 30 NM of a Class B primary airport, surface to 10,000 feet, transponder with Mode C and ADS-B Out are required.
*Source: 91.215(b)(2), 91.225(d)(2) eCFR**
- Flying beneath a Class B shelf requires no clearance, but the veil's equipment rules still apply.
*Source: 91.131, 91.215(b)(2) eCFR**
- Class C: airports with a tower and radar approach control — usually a 5 NM core from the surface to 4,000 feet above the airport, and a 10 NM shelf from 1,200 to 4,000 feet above it.
Source: AIM 3-2-4*
- Class C equipment: two-way radio, transponder with Mode C, and ADS-B Out.
*Source: 91.130(d), 91.215, 91.225 eCFR**
- No specific pilot certification is required for Class C or D.
Source: AIM 3-2-4, 3-2-5*
- Class D: airports with an operating control tower — surface to about 2,500 feet above the airport, individually tailored.
Source: AIM 3-2-5*
- Class D requires only a two-way radio — no transponder or ADS-B from the class itself.
*Source: 91.129 eCFR**
- Class E is all controlled airspace that is not A, B, C, or D.
Source: AIM 3-2-6*
- A magenta vignette means Class E begins at 700 feet AGL; a blue vignette means 1,200 feet AGL.
Source: AIM 3-2-5/3-2-6*
- A dashed magenta line is a Class E surface area — controlled airspace to the ground for an airport.
Source: AIM 3-2-6*
- Class E ends at, but does not include, 18,000 feet MSL.

Source: AIM* 3-2-6

- VFR flight in Class E has no entry or communication requirement — the control is for IFR separation.

Source: AIM* 3-2-6

- Federal airways (Victor airways) are Class E corridors from 1,200 feet AGL up to but not including 18,000 feet; width is commonly taught as 4 NM each side of the centerline.

Source: AIM* 3-2-6 (vertical extent); IPH* ch. 2 (width)

- Class G is uncontrolled airspace — everything not designated A through E.

Source: AIM* 3-2-1

- ATC exercises no control over VFR aircraft in Class G; the VFR minimums and right-of-way rules are the whole rulebook there.

Source: AIM*, 91.155 eCFR*

- Class G above 1,200 AGL and below 10,000 MSL, day: 1 statute mile; 500/1,000/2,000.

Source: 91.155(a) eCFR*

- Class G above 1,200 AGL and below 10,000 MSL, night: 3 statute miles; 500/1,000/2,000.

Source: 91.155(a) eCFR*

- Class G above 1,200 AGL and at or above 10,000 MSL: 5 statute miles; 1,000/1,000/1 statute mile.

Source: 91.155(a) eCFR*

- Under a surface-designated controlled airspace ceiling below 1,000 feet, VFR flight beneath the ceiling is prohibited.

Source: 91.155(c) eCFR*

- To take off, land, or enter the pattern under VFR in a B/C/D/E surface area, ground visibility must be at least 3 statute miles (flight visibility if none is reported).

Source: 91.155(d) eCFR*

- Special VFR lets you operate below basic VFR minimums inside the lateral bounds of a surface area, below 10,000 feet MSL.

Source: 91.157(a) eCFR*

- Special VFR requires an ATC clearance — and the pilot must ask; ATC never offers it.

Source: 91.157(b)(1) eCFR*, AIM* 4-4-6

- Special VFR minimums: 1 statute mile flight visibility, clear of clouds.

Source: 91.157(b)(2),(3) eCFR*

- Special VFR takeoff or landing needs ground visibility of at least 1 statute mile — or flight visibility of 1 mile if ground visibility is not reported.

Source: 91.157(c) eCFR*

- Special VFR between sunset and sunrise requires an instrument-rated pilot and an IFR-equipped aircraft.

Source: 91.157(b)(4) eCFR*

- Prohibited areas (P-numbers) ban flight entirely for security reasons.

Source: AIM* 3-4-2

- Restricted areas (R-numbers) contain invisible hazards — artillery, gunnery, guided missiles; entry when active requires the controlling agency's authorization.

Source: AIM* 3-4-3

- Warning areas (W-numbers) carry restricted-area hazards over international waters, from 3 NM offshore outward.

Source: AIM* 3-4-4

- MOAs separate military training from IFR traffic; VFR flight may enter, but check activity and use extreme

caution.

Source: AIM 3-4-5*

- Alert areas mark high volumes of training or unusual activity; no clearance needed, and every pilot shares collision-avoidance responsibility equally.

Source: AIM 3-4-6*

- Controlled firing areas suspend their activity when spotters see an aircraft coming — which is why they are not charted.

Source: AIM 3-4-7*

- SUA times, altitudes, and controlling agencies print on the chart margin; live status comes from FSS, the controlling agency, or the FAA SUA site.

Source: AIM 3-4-9*

- TFRs are issued by NOTAM — they never appear on the printed chart.

*Source: 91.137(a) eCFR**

- 91.137 TFRs protect three things: people and property near a surface hazard, disaster relief aircraft, and the airspace over events that draw sightseers.

*Source: 91.137(a)(1)–(3) eCFR**

- Large sporting events carry a standing security TFR (commonly 3 NM and 3,000 feet AGL over major stadium events); the exact terms live in the current FDC NOTAM, so check it — the figures are not in a regulation.

*Source: standing FDC NOTAM (check current NOTAM at briefing); 99.7 eCFR**

- Presidential and VIP TFRs move with the person; violating one gets an armed escort.

*Source: 91.141 eCFR**

- Checking TFRs is part of every preflight: briefing output plus tfr.faa.gov; EFB overlays help but can lag.

*Source: 91.103; 91.137 eCFR**

- Entering an ADIZ requires a filed and activated flight plan — DVFR for a VFR flight.

*Source: 99.11 eCFR**

- ADIZ operations require a functioning two-way radio with a continuous listening watch.

*Source: 99.9(a) eCFR**

- ADIZ operations require an operating transponder with altitude reporting.

*Source: 99.13 eCFR**

- Flying VFR within 60 NM of the Washington DC VOR requires the FAA's DC SFRA special awareness training.

Source: AIM 3-5-8; 91.161 eCFR**

- Special flight rules areas (DC, Grand Canyon, and others) carry their own part 93 rules — read them before going near.

Source: AIM 3-5-7; 14 CFR 93*

- A TRSA offers voluntary radar services to VFR aircraft — it is not a regulatory airspace class.

Source: AIM 3-5-6*

- Transponder with Mode C is required at and above 10,000 feet MSL (except at and below 2,500 AGL), everywhere in the 48 states.

*Source: 91.215(b)(5)(i) eCFR**

- The airspace boundary is where the airplane is, not where the pilot thinks it is — fix position against the chart before the line, every time.

Source: NA; PA.I.E.R1

- The riskiest airspace is the kind you did not know was there: preflight the whole route's airspace, including what a diversion would enter.

Source: NA; P.A.I.E.R1

- For a student pilot, any flight beyond 25 NM from the departure airport triggers the 61.93 solo cross-country rules.

Source: 61.93(a)(1)(i) eCFR*

- Landing anywhere other than the airport you took off from also triggers 61.93 — distance does not matter.

Source: 61.93(a)(1)(ii) eCFR*

- Solo cross-country privileges require flight training on the 61.93 maneuvers for the make and model to be flown.

Source: 61.93(a)(2)(i) eCFR*

- The student must have demonstrated cross-country proficiency to an authorized instructor.

Source: 61.93(a)(2)(ii) eCFR*

- The 61.87 pre-solo maneuvers must have been accomplished in the make and model (or a similar one) before solo cross-country.

Source: 61.93(a)(2)(iii) eCFR*

- The student must comply with every limitation in the instructor's cross-country endorsement.

Source: 61.93(a)(2)(iv) eCFR*

- Flying outside the endorsement's stated limitations violates 61.93 — the limitations are regulation, not advice.

Source: 61.93(a)(2)(iv) eCFR*

- Solo cross-country also requires ground training on the 61.93(e) subjects, not just flight training.

Source: 61.93(a)(3) eCFR*

- The 25 NM practice-airport exception lets a student fly solo to one nearby airport for takeoff-and-landing practice only.

Source: 61.93(b)(1) eCFR*

- The 25 NM exception requires prior training at that airport: both directions over the route, pattern entry and exit, and takeoffs and landings there.

Source: 61.93(b)(1)(i) eCFR*

- The 25 NM exception requires an endorsement from the instructor who gave that training, plus a current 61.87 solo endorsement.

Source: 61.93(b)(1)(ii),(iii) eCFR*

- The repeated-route exception: specific solo cross-countries to an airport within 50 NM may repeat without a fresh per-flight endorsement.

Source: 61.93(b)(2) eCFR*

- The repeated-route exception requires training both directions over the route with pattern work at the airports used, plus a proficiency endorsement for those flights.

Source: 61.93(b)(2)(i),(ii) eCFR*

- Endorsement one: a one-time solo cross-country endorsement for the category of aircraft.

Source: 61.93(c)(1) eCFR*

- Endorsement two: a one-time solo cross-country endorsement for the specific make and model.

Source: 61.93(c)(2) eCFR*

- Endorsement three: a per-flight endorsement after an instructor reviews that flight's cross-country planning.

Source: 61.93(c)(3) eCFR*

- The per-flight endorsement names the make and model, states the planning is correct and the student prepared under the known conditions, and states the instructor's limitations are met.

Source: 61.93(c)(3) eCFR*

- Before permitting a solo cross-country, the instructor must determine the planning is correct for the flight.

*Source: 61.93(d)(1) eCFR**

- The instructor must review current and forecast weather and determine the flight can be completed under VFR.

*Source: 61.93(d)(2) eCFR**

- The instructor must determine the student is proficient to conduct the flight safely.

*Source: 61.93(d)(3) eCFR**

- The instructor must confirm the make-and-model cross-country endorsement exists and the solo endorsement is current.

*Source: 61.93(d)(4),(5) eCFR**

- 61.93(e) lists twelve required cross-country training subjects, from chart navigation with a magnetic compass to control by instrument reference.

*Source: 61.93(e) eCFR**

- The (e) subjects include procuring and analyzing weather reports and recognizing critical weather in flight — including estimating visibility while airborne.

*Source: 61.93(e)(3) eCFR**

- The (e) subjects include recognizing and avoiding the hazardous terrain features of the area where the cross-country will be flown.

*Source: 61.93(e)(7) eCFR**

- Short-field, soft-field, and crosswind takeoffs and landings, plus V_x and V_y climbs, are required (e) subjects — strange runways are the point of the training.

*Source: 61.93(e)(10),(11) eCFR**

- For private pilot aeronautical experience, "cross-country time" requires a landing more than 50 NM straight-line from the original departure point.

*Source: 61.1 (cross-country time)(ii) eCFR**

- The certificate requires 10 hours of solo flight time in the areas of operation.

*Source: 61.109(a) eCFR**

- Five of those solo hours must be cross-country time.

*Source: 61.109(a)(5)(i) eCFR**

- The long solo cross-country must total at least 150 NM.

*Source: 61.109(a)(5)(ii) eCFR**

- The long solo cross-country must include full-stop landings at three points.

*Source: 61.109(a)(5)(ii) eCFR**

- One segment of the long solo cross-country must be a straight-line distance of more than 50 NM between its takeoff and landing points.

*Source: 61.109(a)(5)(ii) eCFR**

- The certificate also requires three solo takeoffs and three full-stop landings at an airport with an operating control tower.

*Source: 61.109(a)(5)(iii) eCFR**

- On a solo cross-country nobody aboard catches the error: the instructor's planning review is the error trap, so bring finished planning, never a plan to finish later.

Source: 61.93(d)(1) eCFR; NA*

- Set the turn-back and divert triggers before takeoff — decisions made alone, airborne, and behind schedule are the worst decisions you will ever make.

*Source: NA; 61.93(d)(2) eCFR**

- Plan fuel to land with a personal reserve well above the legal minimum — the legal reserve is a violation line, not a planning target.

Source: 91.151; NA

- Get-home-itis is strongest on the return leg of a solo cross-country; the endorsement's limitations are the pre-made answer to it.

Source: 61.93(c)(3)(iii) eCFR; NA*

- If weather deteriorates en route below what the flight was endorsed for, the plan is land or turn back — continuing is both illegal and the classic fatal chain.

*Source: 61.93, 61.89 eCFR**

- On every solo cross-country the student must carry the pilot logbook, the student pilot certificate, and any other required record, as evidence of the clearances and endorsements.

*Source: 61.51(i)(2) eCFR**

- The private pilot airplane knowledge test is test code PAR, with 60 scored questions.

*Source: Testing Matrix 10/22/25 KTF**

- The allotted time is 2.0 hours.

*Source: Testing Matrix KTF**

- The passing score is 70.

*Source: Testing Matrix KTF**

- The minimum age to take the private pilot knowledge test (PAR) is 15.

*Source: Testing Matrix KTF**

- The private pilot certificate itself requires age 17 — passing the written early does not move that date.

*Source: 61.103(a) eCFR**

- Test content aligns to the ACS, which is incorporated by reference into part 61 — the ACS is the study map.

*Source: 61.14(b)(3); ACS-6C App 1 KTF**

- The AKTR prints an ACS code for every question you missed.

*Source: ACS-6C App 1; Testing Matrix KTF**

- Your examiner reads those AKTR codes too: deficient areas get retested at the practical, and the pre-checkride endorsement must certify they were retrained.

*Source: 61.39(a)(6)(iii) eCFR**

- Authorization to test is an instructor's endorsement certifying ground training or home study completed and the applicant prepared.

*Source: 61.35(a)(1), 61.103(d) eCFR**

- You need an FTN (Federal Tracking Number) from IACRA before you can sit the test.

*Source: Testing Matrix KTF**

- Bring identification with photo, signature, date of birth, and residential address.

Source: 61.35(a)(3) eCFR; Testing Matrix KTF**

- The knowledge test must be passed within the 24 calendar months preceding the month of the practical test.

*Source: 61.39(a)(1)(i) eCFR**

- You present the AKTR when you apply for the practical test.

*Source: 61.39(a)(2) eCFR**

- After a failure, retesting requires additional training and an endorsement from the instructor who gave it.

*Source: 61.49(a) eCFR**

- The test is taken at PSI centers; the FAA points applicants to PSI's free sample tests to learn the interface.

Source: KTF (faa.psiexams.com)*

- Read the final sentence of the stem first — it is the actual question; the paragraph above it is scenery until you know what is being asked.

Source: NA (genre convention)

- Every figure on the test comes from the published testing supplement (FAA-CT-8080-2H) — practice with the real supplement so its print quality never surprises you.

Source: Testing Matrix KTF; NA*

- Compute your answer before reading the choices — the distractors are correct answers to adjacent mistakes.

Source: NA (genre convention)

- Choose the answer closest to your computation; rounding differences between your method and the FAA's are expected.

Source: NA (genre convention)

- Never leave a question blank — an unanswered question is scored wrong, and a guess costs nothing extra.

Source: NA (genre convention)

- Budget two minutes per question; flag and move past anything that stalls you, then return.

Source: NA (genre convention)

- North Aero students sit the written at the Phase 3/4 boundary — Phase 4 rides on a passed written.

Source: MODULES.md (ADR 0018 ruling 3) NA

- Every checkride maneuver gets a standing brief before the flight that flies it: purpose, setup and configuration, target speeds, the ACS standard, and the common errors.

Source: NA (module convention; standards themselves are 4-R.p48–p59)

- Normal takeoff configuration is the POH's — flap setting, trim, and controls positioned for the wind — set and checked before taking the runway, not after full power.

Source: POH/AFM sect. 4 (pin-needed); AFH ch. 5 (pin-needed)

- The short-field takeoff starts at the very beginning of the usable runway in the POH's short-field configuration — runway behind you is distance the chart assumed you had.

Source: AFH ch. 5 (pin-needed); POH/AFM sect. 4 (pin-needed)

- Short-field technique: hold the brakes, set full power, check the engine instruments, then release — the roll begins with the engine already proven.

Source: AFH ch. 5 (pin-needed)

- Rotate at the POH speed and climb at the obstacle-clearance speed until the obstacle is cleared, then lower the nose to VY — pulling off early or climbing steep and slow trades away the margin the chart assumed.

Source: AFH ch. 5 (pin-needed); POH/AFM sect. 4/5 (pin-needed)

- Soft-field takeoff configuration: the POH flap setting with full aft yoke before the roll begins — the elevator lifts the nosewheel out of the drag as soon as it can fly.

Source: AFH ch. 5 (pin-needed)

- The soft-field takeoff is a weight transfer: from wheels to wings as early as possible, because a wheel in soft surface is drag and a wing in clean air is lift.

Source: AFH ch. 5 (pin-needed)

- Lift off in ground effect below normal climb speed, then level to accelerate within ground effect — climbing out before reaching climb speed settles the airplane back onto the surface.

Source: AFH ch. 5 (pin-needed)

- Soft-field landing: touch down at the minimum controllable speed, hold the nosewheel off with elevator, and

keep the airplane rolling — an airplane stopped on a soft surface may be an airplane staying there.

Source: AFH ch. 8 (pin-needed)

- The short-field approach is flown to a chosen touchdown point at the POH speed — extra knots become float, and float is touchdown distance you cannot get back.

Source: AFH ch. 8 (pin-needed)

- A forward slip exists to steepen the descent without gaining airspeed — used when high on final, against an obstacle, or when flaps are unavailable or unwise.

Source: AFH ch. 8 (pin-needed)

- In a slip the fuselage's side does the work: altitude is spent as drag while pitch holds the approach speed — energy management by geometry, not by airspeed.

Source: AFH ch. 8 (pin-needed)

- Wind correction in a forward slip: slip toward the crosswind — low wing into the wind, opposite rudder — so that removing the slip leaves the crosswind correction already in place.

Source: AFH ch. 8 (pin-needed)

- The slip comes out before touchdown with the longitudinal axis aligned to the runway — touching down misaligned side-loads the landing gear.

Source: AFH ch. 8 (pin-needed)

- The go-around begins with immediate, smooth, full power and pitch to arrest the descent — everything else waits.

Source: AFH ch. 8 (pin-needed)

- Go-around configuration is cleaned up in stages per the POH — flaps come up incrementally, after the descent is stopped and the speed is safe; dumping all flap at once settles the airplane. (The trim-force trap is 1-5.p24.)

Source: AFH ch. 8 (pin-needed); POH/AFM sect. 4 (pin-needed)

- Steep-turn entry: clear the area, then roll to 45 degrees, adding power and back pressure as the bank passes about 30 — the doubled load factor demands more lift and more thrust.

Source: AFH ch. 9 (pin-needed)

- Lead the steep-turn rollout by about half the bank angle — begin rolling out roughly 20 degrees before the entry heading.

Source: AFH ch. 9 (pin-needed)

- Altitude loss in a steep turn is corrected bank-first: shallow the bank, raise the nose, then re-establish — pulling harder at 45 degrees only tightens the descending spiral. (Overbanking mechanism: 1-5.p43.)

Source: AFH ch. 9 (pin-needed)

- Ground reference maneuvers exist to teach wind-drift correction — holding a chosen ground track while the wind works on the airplane, the skill the traffic pattern is made of.

Source: AFH ch. 6 (pin-needed)

- The bank in a ground-reference turn tracks groundspeed: steepest turning downwind, where groundspeed is highest, and shallowest turning upwind.

Source: AFH ch. 6 (pin-needed)

- Straight segments of a ground-reference maneuver are held with a crab into the wind, and the maneuver is entered downwind — the steepest bank comes first, while attention is freshest.

Source: AFH ch. 6 (pin-needed)

- Division of attention is the graded risk of the maneuvering Tasks: track the reference with brief glances while flying the airplane by attitude — fixation on the point, at low altitude, is the built-in trap.

Source: AFH ch. 6 (pin-needed); FAA-S-ACS-6C V

GOING DEEPER

- A current day-solo endorsement by itself never authorizes solo flight at night.

*Source: 61.87(o) eCFR**

- The 90-day update can be made by any authorized instructor who meets 61.87(p) — it does not have to be the original endorser.

*Source: 61.87(p) eCFR**

- The single exception to the international ban is the named Alaska–Yukon training route (Haines/Gustavus/Juneau to Whitehorse and back).

*Source: 61.89(a)(5) eCFR**

- The student pilot's visibility limits are stricter than basic VFR — a day that is legal for a private pilot can still be illegal for a student solo.

*Source: 61.89(a)(6), 91.155 eCFR**

- Solo privileges live in the logbook, not on the certificate: the endorsements are the authorization, and on solo cross-countries the logbook and student certificate must be carried as evidence of them.

*Source: 61.87, 61.51(i)(2) eCFR**

- An aircraft with an unapproved part installed is unairworthy even if everything works — the conformity prong fails.

Source: 14 CFR 3.5(a) TB

- A fully stock aircraft with a cracked spar is unairworthy — the safe-condition prong fails.

Source: 14 CFR 3.5(a) TB

- The rule says owner OR operator: a renter operating the airplane shares legal exposure for a lapsed inspection.

Source: 91.403(a); AC 39-7D TB

- Making a fraudulent statement about airworthiness is itself a violation.

Source: 14 CFR 3.5(b) TB

- The mechanic's signature approves return to service only for the work performed — it is not a statement that the whole aircraft is airworthy.

*Source: 43.9(a)(4) eCFR**

- If maintenance may have appreciably changed flight characteristics, no passengers may be carried until a pilot flies an operational check and logs it in the aircraft records.

*Source: 91.407(b) eCFR**

- A private pilot certificate is the FAA's minimum qualification for that post-maintenance operational check flight.

*Source: 91.407(b) eCFR**

- The check flight is not required if ground tests or inspection show conclusively that flight characteristics did not change.

*Source: 91.407(c) eCFR**

- The first flight after maintenance is the highest-paperwork-risk flight: before accepting the airplane, read the return-to-service entry for the work that was done.

Source: 91.407(a) eCFR; TB (ratified framing)*

- The annual and the 100-hour have the same scope — part 43 Appendix D covers both; the difference is who may sign.

Source: 43 App. D; 65.95(a); 43.11 TB

- An annual must be signed off by a mechanic holding Inspection Authorization (IA); an A&P without IA may

sign a 100-hour.

Source: 65.95(a); 43.11 TB

- Overflight time is not free: the excess hours count toward the next 100 hours of time in service.

*Source: 91.409(b) eCFR**

- If an annual finds the aircraft unairworthy, the inspector gives the owner a discrepancy list — the fix path is repair or a ferry permit, not a permanently grounded airplane.

Source: 43.11(a)(5) TB

- A progressive inspection program may replace the annual/100-hour cycle; it must completely inspect the aircraft within each 12 calendar months.

*Source: 91.409(d) eCFR**

- Aircraft on special flight permits and current experimental certificates are excepted from the annual/100-hour rules.

*Source: 91.409(c)(1) eCFR**

- The AD status record must show, for each AD, the method of compliance, the AD number and revision date, and the next due time for recurring ADs.

*Source: 91.417(a)(2)(v) eCFR**

- Major repairs and major alterations get an extra document: FAA Form 337.

Source: 43.9(d); Plane Sense ch. 7 TB

- ELT battery replacement is due after more than 1 cumulative hour of use, or at 50 percent of useful battery life.

Source: 91.207(c) TB

- The 24-calendar-month altimeter/static check of 91.411 is an IFR requirement, not a VFR one.

Source: 91.411 TB

- "Operate" in the AD rule includes causing or authorizing use — owners and renters are both exposed.

Source: AC 39-7D TB

- The 10-hour inspection overflight never extends an AD compliance time.

Source: AC 39-7D ¶11a TB

- When an AD lists no serial numbers, all serial numbers are affected.

Source: AC 39-7D ¶9a TB

- ADs ruled out by serial or part number still get a recorded N/A determination — the determination is the compliance record.

Source: AC 39-7D ¶9a; 91.417(a)(2)(v) TB

- Every annual and 100-hour inspection must determine AD compliance as part of the inspection.

Source: 43.15(a); AC 39-7D ¶13b TB

- A manufacturer service bulletin is not binding under part 91 by itself, even when stamped MANDATORY.

Source: AC 39-7D (verified negative); TB

- A service bulletin becomes compulsory only through an AD that adopts it or an airworthiness limitations section.

Source: 91.403(c) eCFR; TB*

- Other special flight permit purposes: delivery or export, production flight testing, evacuation from impending danger, and customer demonstration flights.

Source: 21.197(a) TB

- Apply for a special flight permit on FAA Form 8130-6; the permit issued is Form 8130-7.

Source: AC 21-12D; Plane Sense ch. 5 TB

- A ferry permit is itself a special airworthiness certificate.

Source: 21.175(b) TB

- A special flight permit never authorizes deviation from part 91's operating rules.

Source: Plane Sense ch. 5 TB

- When an AD grounds an aircraft away from a repair base, a special flight permit is the legal path home if the AD allows it.

Source: AC 39-7D ¶11d TB

- Even a listed task stops being preventive maintenance if it involves complex assembly operations.

*Source: 43 App. A(c) chapeau eCFR**

- The pilot's signature returns to service only the pilot's own work.

Source: 43.9(a)(4) eCFR; AC 43-12A TB*

- Pilot-performed preventive maintenance still triggers 91.407(a): the entry must exist before the next flight.

Source: 91.407(a) eCFR; AC 43-12A TB*

- No application or approval is required to operate under 91.213(d).

Source: AC 91-67A TB

- Step zero is confirming whether the operator holds an MEL and LOA; if an approved MEL exists, the 91.213(d) process does not apply.

Source: 91.213(a),(c) eCFR; TB*

- An approved MEL plus its letter of authorization constitute a supplemental type certificate for that aircraft.

*Source: 91.213(a)(2) eCFR**

- An MEL may not include items essential for safe operation under the type certification, items required operative by an AD, or items required for the specific operation.

*Source: 91.213(b) eCFR**

- Turbine-powered airplanes cannot use the 91.213(d) shortcut.

Source: 91.213(d)(1); AC 91-67A 4.1.2.2 TB

- Answering screen one is research, not recall: find the TCDS, read the certification basis, then read that rule's equipment requirements.

Source: 21.41; TCDS 2A13 worked example TB

- When the equipment list marks nothing required and there is no KOEL, the conservative default applies: factory-installed means treat it as required and working.

Source: NA (North Aero doctrine, ratified 2026-07-11) TB

- Deactivation is not preventive maintenance; if it involves maintenance, a part-43-authorized person must do it and record it.

Source: AC 91-67A 4.2.2 TB

- Switching an item off is not deactivating it.

Source: AC 91-67A 4.2.2 TB

- An aircraft handled correctly under 91.213(d) is legally "in a properly altered condition acceptable to the Administrator."

*Source: 91.213(d) eCFR**

- Items deferred under 91.213(d) must be repaired, replaced, removed, or inspected at the next required inspection.

*Source: 91.405(c) eCFR**

- An experimental airworthiness certificate carries operating limitations, including limits on carrying persons and property for compensation.

Source: 91.319 TB

- Humidity is the weakest of the three density levers: fully saturated warm air is only about 0.5 to 1 percent lighter than dry air.

Source: TC (physics-precision pass)

- Wind above about 15 knots lifts advection fog into a low stratus deck instead of clearing it.

Source: AWH ch. 18 TC

- Steam fog: cold air over warm water, with low-level turbulence and icing potential.

Source: AWH ch. 18 TC

- Mist (BR) is the same physics as fog with visibility 5/8 mile or more.

Source: AWH TC

- Haze creates the slant-visibility trap: looking down it seems clear; looking ahead into it, the horizon and traffic disappear.

Source: AWH ch. 21 TC

- A sounding (Skew-T) draws ideas 3 and 4 as two lines: where temperature and dewpoint pinch together is cloud; the temperature line's slope is the lapse rate.

Source: NWS JetStream (sounding pass) TC

- On a sounding, the temperature line crossing 0°C marks the freezing level; where it warms with height is an inversion.

Source: NWS JetStream TC

- The cloud-base estimator works for convective cumulus only — it fails for stratus and frontal decks.

Source: TC (accuracy caveat)

- Frost matters because it is sandpaper on the wing: up to about 30 percent lift loss and 40 percent drag rise.

Source: AWH TC

- Stability is judged by comparing the environmental lapse rate to the adiabatic rates — the answer almost no one gives by the numbers.

Source: AWH ch. 13; TC (DPE gouge)

- Moisture destabilizes: because saturated air cools slower as it rises, moist air turns unstable more easily.

Source: AWH 13.3 TC

- Conditional instability: air that is stable while dry becomes unstable once lifted to saturation.

Source: AWH 13.3.4 TC

- The level of free convection is the height above which a lifted parcel rises on its own — the key to elevated and embedded storms.

Source: AWH 13.6.3 TC

- Wind veers (shifts clockwise) and strengthens as you climb out of the friction layer.

Source: NWS mechanism TC

- The rotor zone under mountain wave crests carries potentially severe-to-extreme wind shear and turbulence.

Source: AWH 16.2.5 TC

- Lenticular and rotor clouds mark a wave, but a dry wave gives no visual warning at all.

Source: AWH 16.2 TC

- Low-level wind shear is defined as 10 knots or more per 100 feet in a layer more than 200 feet thick, within 2,000 feet of the surface.

Source: AWH 19.2.4.1 TC

- Warm-front occlusions are the embedded-thunderstorm factory: storms hide inside stratiform decks.

Source: AWH 11.3.4 TC

- Clouds are classified by height families; the AWH uses three levels while the PHAK keeps a fourth vertical-development group — a real two-book difference.

Source: AWH ch. 12; PHAK TC

- "Severe" turbulence means large, abrupt changes and the aircraft momentarily out of control — report it with that word only when it was.

Source: AWH 19.1 TC

- Clear air turbulence rides near the jet stream and arrives with no cloud to warn you.

Source: AWH TC

- A single cell runs about 30 minutes, and its hazards peak at the end of the mature stage.

Source: AWH 22.3 TC

- Hail can fall in clear air beneath and beside the anvil.

Source: AWH 22 TC

- Storm tops at or above 35,000 feet are extremely hazardous.

Source: AWH 22.8.2 TC

- Circumnavigate any area with storms covering more than half the ground.

Source: AWH 22.8.2 TC

- Microbursts last 5 to 15 minutes; virga and blowing dust rings are the visible clues.

Source: AWH TC

- Most icing lives between 0 and -20°C; half of all reports fall between -8 and -12°C; icing is rare below -40°C.

Source: AWH TC

- Icing intensities are defined terms, and severe icing requires immediate exit by regulation.

Source: AC 91-74B TC

- Tailplane icing: extending flaps can trigger a tail stall — know the aircraft's guidance before configuring in ice.

Source: AC 91-74B TC

- The current weather book is the Aviation Weather Handbook (FAA-H-8083-28B); the classic weather ACs (00-6B, 00-45H, 00-24C, 00-30C, 00-54) were all cancelled in 2022.

Source: AWH (verified current 2026-08-18); cancellation notices TC

- Every PIREP includes aircraft type because turbulence and icing intensity are relative to the aircraft.

Source: AWH 19.1, 24.5.1.5 TC

- ATC solicits PIREPs when ceilings or visibility drop and near hazards like icing and wind shear.

Source: AIM 7-1-18a TC*

- The absence of PIREPs is not the absence of hazard — few pilots file.

Source: AIM 7-1-18b TC*

- G-AIRMETs are graphical snapshots at 3-hour steps out to 12 hours.

Source: AWH TC

- A SIGMET is valid for up to 4 hours.

Source: AWH TC

- Convective SIGMETs are issued hourly at 55 past and are valid up to 2 hours.

Source: AWH TC

- A Center Weather Advisory is a nowcast aid for aircraft already en route — not a flight planning product.

Source: AWH TC

- Text Area Forecasts still exist for Alaska and the Gulf/Caribbean.

Source: AWH Table 3-11 TC

- The ceiling-and-visibility picture the ACS calls "CVA" is today a gridded real-time analysis on aviationweather.gov — an analysis of now, not a forecast.

Source: AWH; AWC (product-name drift) TC

- FB direction digits 51–86 mean 100+ knots: subtract 50 from the direction, add 100 to the speed.

Source: AWH 27.2.1 TC

- FB temperatures above 24,000 feet print without a sign because they are always negative.

Source: AWH 27.2.1 TC

- Outlook categories are probabilities of severe weather within 25 miles of a point — a MRGL day is not a zero day.

Source: SPC/NWS TC

- A METAR is a point observation: it describes the sensor's spot at one moment, and the edge of the field can differ.

Source: AWH; WPR11FA316 (paraphrase-level) TC

- Coded winds (METAR, TAF, FB) are TRUE north; voice winds (ATIS, tower, AWOS) and runway numbers are MAGNETIC.

Source: AWH Table 3-5 TC

- Military TAFs read differently: visibility in meters, QNH altimeter groups, turbulence "5" groups and icing "6" groups.

Source: AFPAM 11-238; NWS TC

- The 5/6 trap: a 5- or 6-group is turbulence/icing in a military TAF but pressure tendency/precipitation in METAR remarks.

Source: TC (rev2 pass)

- The NWS Area Forecast Discussion, read beside the TAF, names hazards the TAF left out for low confidence — and says how confident the forecaster is.

Source: NWS AFD guidance TC

- The mosaic can be 15 to 20 minutes older than even the age it displays — it shows where the weather was.

Source: AWH 22.8.2 TC

- Pilots have died maneuvering around a mosaic they believed was live; the NTSB wrote the latency alert after such accidents.

Source: NTSB SA-017 TC

- NEXRAD coverage has real gaps in the western mountain states.

Source: AC 00-63B TC

- Refresh with an abbreviated briefing when the last briefing is more than an hour old or the weather is questionable.

Source: AC 91-92 8.1 TC

- Onboard weather tempts continuation into deteriorating weather — pick the divert point before launch, while nobody is invested.

Source: AC 00-63B; NA doctrine TC

- At the dozen busiest Class B primary airports (appendix D §4: ATL, ORD, LAX, SFO, DCA, and others), only a private certificate or better may take off or land — no student endorsement works there.

Source: 91.131(b)(2) eCFR; AIM* 3-2-3*

- VFR aircraft inside Class B receive ATC separation services.

Source: AIM 3-2-3*

- Aircraft certificated without an engine-driven electrical system (and balloons and gliders) may operate inside

the veil, but only outside B/C and below the Class B ceiling or 10,000 feet.

*Source: 91.215(b)(3) eCFR**

- Class C and D altitudes are charted in MSL but defined by height above the airport.

Source: AIM 3-2-4, 3-2-5*

- If the controller answers with your callsign — even just "(callsign), standby" — communications are established and you may enter Class C; a reply without your callsign establishes nothing.

Source: AIM 3-2-4 (positive case verbatim; converse is the note's plain implication)*

- The Class C outer area (normally 20 NM) offers the same services, but participation there is voluntary.

Source: AIM 3-2-4*

- Above the ceiling of a Class B or C area, up to 10,000 feet, Mode C and ADS-B Out are still required.

*Source: 91.215(b)(4), 91.225(d)(3) eCFR**

- When part-time Class D reverts to Class G, Class G runs up to but not including the overlying controlled airspace.

Source: AIM 3-2-5*

- Departing a satellite airport without a tower inside Class C or D: establish communications with ATC as soon as practicable after takeoff.

*Source: 91.129(c)(2)(ii), 91.130(c)(2)(ii) eCFR**

- Where nothing lower is designated, Class E starts at 14,500 feet MSL.

Source: AIM 3-2-6*

- The 10,000-foot rows (5 SM, 111) apply only above 1,200 AGL — over high terrain, the low-altitude Class G rows can reach above 10,000 MSL.

*Source: 91.155(a) eCFR**

- The 5-SM rows exist because aircraft above 10,000 feet may exceed 250 knots — more speed needs more seeing distance.

*Source: 91.117(a) eCFR**

- Night exception: an airplane in Class G at night, in the pattern within 1/2 mile of the runway, may operate with 1 statute mile and clear of clouds.

*Source: 91.155(b)(2) eCFR**

- The 91.155 night rows switch on at evening civil twilight — the 1.1 definition of night, not sunset.

*Source: 91.155, 1.1 eCFR**

- An aircraft sitting exactly at the base of a Class E shelf is legally in the airspace below it.

*Source: 91.155(e) eCFR**

- Some busy Class B surface areas prohibit Special VFR for fixed-wing aircraft — charted "NO SVFR."

*Source: 91.157(a); part 91 App. D §3 eCFR**

- Special VFR does not rescue a student solo: the 61.89 visibility limits (3 SM day, 5 SM night) still bind the student pilot.

*Source: 61.89(a)(6), 91.157 eCFR**

- When a restricted area is inactive and released, ATC will allow flight through it — ask.

Source: AIM 3-4-3*

- National security areas request voluntary avoidance and can be made mandatory by NOTAM.

Source: AIM 3-4-8*

- Entry into a hazard-protection TFR is limited to aircraft participating in the relief effort under the on-scene official's direction.

*Source: 91.137(b) eCFR**

- A DVFR departure must launch within 5 minutes of the flight plan's estimated departure time.
*Source: 99.9(b)(2) eCFR**
- Military training routes: IR and VR routes; a 4-digit route number means no segment above 1,500 feet AGL.
Source: AIM 3-5-2*
- ADS-B Out mirrors the transponder map and adds Class E at/above 10,000 (except below 2,500 AGL) and the Gulf shelf at/above 3,000 MSL within 12 NM.
*Source: 91.225(d) eCFR**
- Class D, and Class E below 10,000 feet (outside any veil), require no transponder and no ADS-B.
*Source: 91.215(b), 91.225(d) eCFR**
- With a failed transponder in flight, ATC can authorize continuing to the destination or repair station; a completely unequipped aircraft must request its deviation at least one hour ahead.
*Source: 91.215(d)(2), (3) eCFR**
- Under the 25 NM exception the only lawful purpose is practicing takeoffs and landings at that other airport.
*Source: 61.93(b)(1)(v) eCFR**
- Even on the repeated 50 NM route, the student still needs the current 61.87 solo endorsement and the 61.93(c) cross-country endorsements.
*Source: 61.93(b)(2)(iii), (iv) eCFR**
- "Known conditions" means the per-flight endorsement expires with the conditions: if the weather changes materially, the review that authorized the flight no longer describes it.
*Source: 61.93(c)(3)(ii) eCFR**
- Basic instrument control is a required cross-country training subject because the deadliest solo trap is losing outside reference.
*Source: 61.93(e)(12) eCFR**
- A 45-NM hop with a landing logs as a 61.93 cross-country event but earns zero 61.109 cross-country time — the two 50/25 mile rules answer different questions.
*Source: 61.1, 61.93 eCFR**
- The 150 NM is total route distance, but the >50 NM test is straight-line between two of the landing points — a triangle can pass the first and fail the second.
*Source: 61.109(a)(5)(ii) eCFR**
- The 2.5 hours printed inside ACS-6C Appendix 1 is an FAA misprint; the corrected time is 2.0.
*Source: FAA ACS Knowledge Test Table correction KTF**
- Tests may include unscored validation questions: they never count for or against you, and the allotted time already covers them.
*Source: Testing Matrix KTF**
- A graduation certificate from an FAA-certificated pilot school is the alternative authorization.
*Source: 61.71(a); Testing Matrix KTF**
- The written rewards precise number recall; the oral rewards understanding — study the numbers for this test, the mechanisms for the checkride.
Source: NA (genre convention)
- The knowledge test is one of three evaluations; K and R elements are primarily evaluated at the knowledge test, then probed again orally.
*Source: ACS-6C App 1 KTF**
- A sustained slip can unport a fuel-tank outlet and interrupt fuel flow — know the POH's slip limitations and which tank is feeding before holding one.

Source: POH/AFM (pin-needed); AFH ch. 8 (pin-needed)

- Slips with flaps extended are restricted or cautioned against in some types — disturbed airflow over the tail can bring pitch oscillation or a tail stall; the POH's word governs.

Source: POH/AFM (pin-needed); AFH ch. 8 (pin-needed)

- In a slip the airspeed indicator may misread from disturbed static and pitot flow — hold the known pitch attitude and carry margin rather than chasing the needle.

Source: AFH ch. 8 (pin-needed); POH/AFM (pin-needed)