

PRIVATE PILOT GROUND SCHOOL

MODULE 2-1 — CROSS-COUNTRY PLANNING (ACS TASK D)

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FACTS TO REMEMBER

KNOW THESE COLD

- Before every flight, the pilot in command must become familiar with all available information concerning that flight.

Source: 14 CFR 91.103

- For a flight away from the vicinity of an airport, preflight action must include weather reports and forecasts.

Source: 14 CFR 91.103(a)

- For a flight away from the vicinity of an airport, preflight action must include fuel requirements.

Source: 14 CFR 91.103(a)

- For a flight away from the vicinity of an airport, preflight action must include alternatives available if the planned flight cannot be completed.

Source: 14 CFR 91.103(a)

- For a flight away from the vicinity of an airport, preflight action must include any known traffic delays advised by ATC.

Source: 14 CFR 91.103(a)

- For every flight, preflight action must include the runway lengths at the airports of intended use.

Source: 14 CFR 91.103(b)

- For every flight, preflight action must include takeoff and landing distance data from the POH/AFM, or other reliable performance information if no AFM is required.

Source: 14 CFR 91.103(b)

- NOTAMs, including TFRs, are part of "all available information" and must be checked before every cross-country flight.

Source: 14 CFR 91.103; AIM 5-1-3

- The VFR sectional chart is the primary planning chart for a private-pilot cross-country; each covers a named region at 1:500,000 scale.

Source: PHAK ch. 16

- Sectional charts expire on a published 56-day cycle; planning on an out-of-date chart risks missing new towers, frequencies, and airspace.

Source: Aeronautical Chart User's Guide

- Route selection starts with the airspace the route crosses: Class B, C, and D add communication or clearance requirements, and special use airspace must be identified and checked.

Source: PHAK ch. 15–16

- The Chart Supplement is the source for airport details the chart cannot show: runway data, lighting, frequencies, fuel, services, and hours.

Source: Chart Supplement legend

- Route selection weighs emergency options — terrain, airports along the way, and glide range — against the shortest straight line.

Source: PHAK ch. 16

– Frequency and navaid selection is part of planning: the VORs, CTAF/tower, and ATC frequencies for each leg are picked before flight, not hunted for in the air.

Source: PHAK ch. 16

– An EFB may replace paper charts for VFR flight if the pilot verifies the chart and database currency before flight.

Source: AC 91-78

– EFB failure must be planned for: charge state, a backup device or paper chart, and heat/sunlight shutdown risk.

Source: AC 91-78

– Cruising altitude must clear terrain and obstacles along the whole route; the quadrangle MEF on a sectional gives the elevation of the highest feature in that quadrangle.

Source: PHAK ch. 16

– The MEF is not a safe cruising altitude by itself — it carries no buffer; the pilot adds a clearance margin above it.

Source: PHAK ch. 16

– Higher cruising altitude increases glide distance and the number of landable options after an engine failure.

Source: PHAK ch. 16; POH glide data

– In level VFR cruise more than 3,000 ft above the surface, a magnetic course of 0–179° requires an odd-thousand MSL altitude plus 500 ft.

Source: 14 CFR 91.159

– In level VFR cruise more than 3,000 ft above the surface, a magnetic course of 180–359° requires an even-thousand MSL altitude plus 500 ft.

Source: 14 CFR 91.159

– Forecast winds aloft change groundspeed and fuel burn with altitude; altitude selection weighs wind advantage against terrain and climb cost.

Source: PHAK ch. 16

– Time en route for a leg equals leg distance divided by groundspeed.

Source: PHAK ch. 16

– Groundspeed is true airspeed corrected for wind: a headwind component lowers it, a tailwind component raises it.

Source: PHAK ch. 16

– Climb segments are planned from POH climb data: time, fuel, and distance to top of climb differ from cruise values and are budgeted separately.

Source: POH/AFM sect. 5

– A descent is planned backward from the destination: choose a descent rate and groundspeed, then compute the distance needed to lose the altitude.

Source: PHAK ch. 16

– Flight-plan times and ETAs are figured in UTC (Zulu); local time converts to UTC by the zone offset, watching the date change.

Source: AIM 4-2-12

– METARs, TAFs, and briefings all timestamp in UTC, so the nav log converts once and stays in one time system.

Source: AWH FAA-H-8083-28

– Leg fuel equals leg time multiplied by the POH fuel-burn rate for the chosen power setting.

Source: POH/AFM sect. 5

- Total fuel required is taxi/runup plus climb plus cruise legs plus descent plus the legal reserve — and the tanks' usable fuel must cover all of it.

Source: 14 CFR 91.151; POH

- Day VFR fuel minimum: enough to fly to the first point of intended landing plus 30 minutes at normal cruising speed.

Source: 14 CFR 91.151(a)

- Night VFR fuel minimum: enough to fly to the first point of intended landing plus 45 minutes at normal cruising speed.

Source: 14 CFR 91.151(a)

- The 91.151 reserve is a legal floor, not a plan; North Aero planning sets a larger personal fuel reserve, fixed before flight.

Source: 14 CFR 91.151; personal minimums doctrine

- Usable fuel, not total fuel, is the planning number: unusable fuel cannot reliably reach the engine in flight attitudes.

Source: POH/AFM sect. 2

- A VFR flight plan exists for search and rescue: it tells Flight Service where to look and when to start looking.

Source: AIM 5-1-4

- A VFR flight plan is not required for most VFR flights, but filing one is the cheapest safety net on a cross-country.

Source: AIM 5-1-4

- A VFR flight plan carries: aircraft ID and type, departure point and time, route, altitude, destination, ETE, fuel on board, souls on board, and contact information.

Source: AIM 5-1-4

- Filing does not activate a VFR flight plan: the pilot opens it after departure by radio, phone, or EFB link to Flight Service.

Source: AIM 5-1-4

- Closing a VFR flight plan is the pilot's job; tower controllers do not close it for you.

Source: AIM 5-1-14

- If a VFR flight plan is not closed within 30 minutes after ETA, search and rescue procedures begin.

Source: AIM 5-1-14

- An intercepted aircraft follows the interceptor's visual signals: rocking wings from the interceptor means "you have been intercepted — follow me."

Source: AIM 5-6

- If intercepted: maintain a steady course, attempt contact on 121.5 MHz, squawk 7700 if unable to communicate, and notify ATC.

Source: AIM 5-6

- The Pilot leg of PAVE on a cross-country adds duration exposure: fatigue, food and water, and currency for the length and conditions of the trip.

Source: PHAK ch. 2

- The Aircraft leg asks whether this airplane is equipped and legal for this route: avionics, lighting for the arrival time, inspections current, performance adequate.

Source: PHAK ch. 2

- The enVironment leg is evaluated leg by leg — weather, terrain, airspace, and obstacles along the whole route, not just at the endpoints.

Source: PHAK ch. 2

- A reason you "must" arrive is itself a risk factor; the mitigation is alternatives arranged before takeoff — an extra day, a backup ride, a planned alternate.

Source: PHAK ch. 2

- VFR flight following is workload-permitting: ATC can refuse or drop it, and radar and radio coverage have floors — it is a service, not a guarantee.

Source: AIM 4-1-15

- No ATC service relieves a VFR pilot of see-and-avoid, terrain avoidance, or airspace compliance.

Source: AIM 4-1-15; 14 CFR 91.113

- Night cross-country planning raises the altitude floor: terrain and obstacles you cannot see demand a larger clearance margin than day.

Source: AFH night ops ch.

- Night cross-country checkpoints must be lighted or self-announcing — airports, beacons, towns, major highways — never section lines or dry creeks.

Source: AFH night ops ch.

GOING DEEPER

- An EFB is an aggregator: its weather and NOTAM feeds carry the limits of the underlying products, so the raw product — not the app's summary — is the authority when they disagree.

Source: AC 91-92

- VFR cruising altitudes key to magnetic course, not heading: the wind correction you fly never changes which altitudes are legal.

Source: 14 CFR 91.159

- The common private-pilot intercept cause is an unchecked TFR; the preflight NOTAM check is the mitigation.

Source: AIM 5-6; 14 CFR 91.103

- A fuel decision point is computed before flight: a named point where, if fuel is below plan, the flight lands and refuels — the decision is made on the ground, not renegotiated in the air.

Source: AC 91-92 §8 doctrine

- Night cross-country routes favor lighted corridors and staying within glide of lighted airports, even at some distance cost.

Source: AFH night ops ch.

THE REGULATIONS BEHIND THIS MODULE

14 CFR 91.103 – Preflight action

Before each flight the pilot in command must become familiar with all available information about that flight. For a flight away from the vicinity of an airport that information includes weather reports and forecasts, fuel requirements, and known ATC delays. It also includes the alternatives available if the flight cannot be completed. For each flight it includes runway lengths and takeoff and landing distance data.

Where it goes deeper: This module, in the first Leg.

14 CFR 91.151 – Fuel requirements for flight in VFR conditions

No person may begin a flight in an airplane under VFR unless, considering wind and forecast weather, there is enough fuel to fly to the first point of intended landing and then, at normal cruising speed, for 30 minutes by day or 45 minutes at night.

Where it goes deeper: This module, in the fuel Leg.

14 CFR 91.159 – VFR cruising altitude or flight level

In level VFR cruise more than 3,000 feet above the surface and below 18,000 feet MSL, a magnetic course of 0 through 179 degrees takes an odd thousand plus 500 feet, and 180 through 359 degrees an even thousand plus 500 feet, unless ATC authorizes otherwise.

Where it goes deeper: This module, in the altitude Leg.