

VFR Cross-Country Planning: The Whole Enchilada

Basic Flight Parameters

1. Select trip date and departure airport.
2. Find an airport that is close to destination, with facilities (runway, fuel, FBO) needed.
3. Determine number and weight of: crew + passengers + baggage/cargo.
4. Determine if night flight (maybe get civil twilight times at departure & destination).
5. Select aircraft, considering capabilities (capacity, range, navigation systems, etc.).

Pilot Currency & Recency

Check: Flight review, Medical, TOs + Idgs past 90 days, Night TOs + Idgs past 90 days

Maintenance Status

Check that the aircraft has no outstanding maintenance that would impact the flight.

Charts

Obtain and review:

1. Current sectional charts covering entire route of flight.
2. If near class B airspace, current terminal area charts.
3. Current chart supplement entries for departure, destination, and alternate airports.
4. Current chart supplement entries for radio navigation aids used.
5. Current airport diagrams for departure, destination, and alternate airports.

Route

1. Select an alternate destination airport.
2. Select route, and determine waypoints (and, if using pilotage, visual checkpoints) along the route.
3. Review route for terrain, obstacles, and airspace (ATC airspace and special-use airspace).

Weather & NOTAMs

Estimate your time en route and pick a initial guess at a cruise altitude, and get a briefing¹:

1. Synopsis: Surface analysis chart, AFDs
2. Adverse conditions: SIGMETs, convective SIGMETs, AIRMETs, etc.
3. Current conditions along route and at departure, destination, alternate airports: METARs, SPECIs, & PIREPs
4. Forecast for flight times along route and at departure, destination, alternate airports: TAFs, GFA
5. Winds (and temperature) aloft along route
6. NOTAMs (check carefully for TFRs and airport/runway closures!)

Is the forecast getting it right? Compare current conditions to forecast for now.

What are the current trends? Look at previous METARs & SPECIs.

What are the forecast trends? Look at the TAFs & GFA beyond your flight time.

Do you need to change the plan based on the weather/NOTAMs? (Reconsider time, route, destination, alternate, etc.)

¹ Get briefing from an EFB app, the 1800wxbrief.com web site, or by calling 1-800-WX-BRIEF. For a telephone briefing, tell briefer, in this order: (1) VFR or IFR, (2) aircraft ID, (3) aircraft type, (4) departure point, (5) departure time, (6) initial cruise altitude, (7) route, (8) destination, (9) estimated time en route.

Performance Computations²

Cruise

For each leg:

1. Select: power setting³ and altitude
2. Compute:
 - 2.a. Cruise TAS
 - 2.b. Heading (with wind correction)
 - 2.c. Ground speed
 - 2.d. Time
 - 2.e. Fuel flow
 - 2.f. Fuel used
3. Fill out a nav log, with
 - 3.a. Route segment that defines this leg
 - 3.b. Distance
 - 3.c. Course (magnetic)
 - 3.d. Selected power setting and altitude
 - 3.e. The six items computed above

Climb

For climb from field elevation to cruise altitude, compute and fill in nav log:

1. Time
2. Distance
3. Fuel used

Descent

For descent from cruise altitude to field elevation⁴, compute and fill in nav log:

1. Time

2. Distance
3. Fuel used

Fuel Budget

Add up fuel budget:

1. Taxi fuel, which includes start, taxi, and run-up
2. Trip fuel, which includes:
 - 2.a. Climb
 - 2.b. Cruise
 - 2.c. Descent
 - 2.d. Approach & landing
3. Alternate fuel⁵, which includes:
 - 3.a. Climb
 - 3.b. Cruise
 - 3.c. Descent
 - 3.d. Approach & landing
4. Reserve (required reserve + any additional pilot's discretionary reserve)

For each leg, compute required remaining fuel, and record on nav log. Also, compute required takeoff fuel and record on nav log.

Takeoff

For each probable takeoff runway:

1. Obtain:
 - 1.a. Runway (or airport) elevation
 - 1.b. Runway heading
 - 1.c. Runway surface type (grass, paved, etc.)

² Flight planning software automates these computations. Consider using a tablet with an EFB app (such as the Garmin Pilot or ForeFlight Mobile apps), or a flight planning web site (such as 1800wxbrief.com or FltPlan.com).

³ For the Cessna 172, cruise at the engine speed (rpm) that produces 60%–80% of rated power.

⁴ Single-engine aircraft often don't have published descent data. In that case, you can either (1) estimate using the cruise performance tables: use your cruise speed, but fuel flow based on your descent power setting, or (2) disregard the descent, and compute your cruise all the way to the destination airport.

⁵ Alternate fuel is required only for IFR, optional for VFR.

- 1.d. Runway condition (dry, wet, icy, snow)
- 1.e. Landing length available
- 1.f. Runway slope
- 1.g. Close-in obstacle height
2. Select aircraft configuration (flaps) / takeoff type (normal, short, etc.)
3. Compute:
 - 3.a. Wind: headwind/tailwind ___ knots
Crosswind ___ knots
 - 3.b. Takeoff distance required
 - 3.c. Takeoff speeds⁶

Landing

For each probable landing runway:

1. Obtain:
 - 1.a. Runway (or airport) elevation
 - 1.b. Runway heading
 - 1.c. Runway surface type (grass, paved, etc.)
 - 1.d. Runway condition (dry, wet, icy, snow)
 - 1.e. Landing length available
 - 1.f. Runway slope
 - 1.g. Close-in obstacle height
2. Select aircraft configuration (flaps) / landing type (normal, short, etc.)
3. Compute:
 - 3.a. Wind: headwind/tailwind ___ knots
Crosswind ___ knots
 - 3.b. Landing distance required
 - 3.c. Landing speeds⁷

Weight & Balance

1. Obtain airplane's basic empty weight & center of gravity (c.g.).
2. Select aircraft loading (what goes where).
3. Check that baggage area weights are in limits.
4. Compute ramp weight, and check that it is within limits.
5. Compute takeoff weight & c.g., and check that both are within limits.
6. Compute landing weight & c.g., and check that both are within limits.

Organize

This is a ton of flight data. Organize it neatly so that you can refer to your nav log, charts, and airport data quickly while you're busy flying the aircraft.

Aircraft, Crew, & Passenger Arrangements

The destination airport may have more than one FBO, and there may be a "city ramp" with few/no services. Plan which you will park at, and consider arrangements for:

1. Fuel purchase
2. Aircraft tie-down/hangaring
3. Crew & passenger needs: food, drink, ground transport, lodging, etc.

⁶ In light piston aircraft, takeoff speeds are usually just fixed numbers that don't need to be recomputed.

⁷ In light piston aircraft, landing speeds are usually only adjusted for wind (add half the steady wind speed).