VFR NAVIGATION LOG

Aircraft Number	N	Notes

Check Points (Fixes)	VOR Ident / Freq.	Course (Route)	Altitude	Wind Dir. / Vel. / Temp	CAS / TAS	TC / -L / +R WCA	TH / -E / +W Var.	MH / ± Dev.	CH	Dist. Leg / Rem.	GS Est. / Act.	Time Off ETE / ATE	ETA / ATA	GPH Fuel / Rem.
									Totals »					

Flight Plan and Weather Log on Reverse Side

Airport & ATIS Advisories

Departure		Destination
	ATIS Code	
	Ceiling & Visibility	
	Wind	
	Altimeter	
	Approach	
	Runway	
	Time Check	

Airport Frequencies

Departure		Destination	
ATIS		ATIS	
Ground		Approach	
Tower		Tower	
Departure		Ground	
CTAF		CTAF	
FSS		FSS	
UNICOM		UNICOM	
Field Elev		Field Elev	
Block In		Log Time	
Block Out			

WEATHER LOG

	Ceiling, Visibility and Precipitation — Reported	Ceiling, Visibility and Precipitation — Forecast	Winds Aloft	Icing and Freezing Level	Turbulence and Cloud Tops	Position of Fronts, Lows and Highs
Departure						
Enroute						
Destination						
Alternate						

FLIGHT PLAN

1. Type (VFR / IFR / DVFR)	2. Aircraft Identification	3. Aircraft Type/ Special Equipment	4. True Airspeed Knots	5. Departure Point	6. Departure Time Proposed (Z)	Actual (Z)	7.Cruising Altitude

8. Route of Flight

9. Destination (Name of airport and city)	10. Est. Time Enroute Hours	Minutes	11. Remarks

12. Fuel on board Hours	Minutes	13. Alternate Airport(s)	14. Pilot's Name, Address, Tel # & Aircraft Home Base	15. # Aboard

16. Color of Aircraft	17. Destination Contact / Telephone (Optional)

CLOSE VFR FLIGHT PLAN WITH ____________________ FSS ON ARRIVAL

Special Equipment Suffix

/X-No Transponder
/T-Transponder with no altitude encoding capability
/U-Transponder with altitude encoding capability
/D-DME, no transponder
/B-DME, transponder with no altitude encoding capability
/A-DME, transponder with altitude encoding capability
/R-RNAV, transponder with altitude encoding capability
/C-RNAV, transponder with no altitude encoding capability
/W-RNAV, no transponder
/G-Global Positioning System (GPS)/Global Navigation Satellite System (GNSS) equipped aircraft with ocianic, enrout, terminal, and GPS approach capability.

Notes and NOTAMs

Position Report

Acft. Ident.	Position	Time	Alt.	IFR/ VFR	Est. Next Fix	Name Following Fix

Report Conditions Aloft - Cloud Tops, Bases, Layers, Visibility, Turbulence, Haze, Ice, Thunderstorms

Abbreviation	Significance	Significance
TC	True Course	The angle between your course and true north.
MC	Magnetic Course	The angle between your course and magnetic north.
Var	Magnetic Variation	The number of degrees left or right used to correct a true course to a magnetic course.
WCA	Wind Correction Angle	The correction applied to a course to correct for wind drift. See Using the E6-B Flight Computer to calculate.
Dev	Magnetic Deviation	Each magnetic compass has built-in errors due to magnetic fields in the airplane affecting the compass's accuracy. The compass deviation
CH	Compass Heading	This is the compass heading you will fly for a specific leg of your flight in your specific airplane.
ETE	Estimated Time Enroute	You will calculate the amount of time you expect to fly each leg using deduced reckoning.
ATE	Actual Time Enroute	You will record the actual amount of time each leg took to fly. You'll use a timer in the airplane to measure this.

Step	Description
Plot Your Course	Using your plotter, draw a course line on your sectional chart. Use a pencil or better yet, an erasable highlighter so that its easier to view your course line. Note that you don't always go directly from your departure to your destination airport. You may need to fly around terrain or airspace, navigate using radio navigation radials, or choose a route that is over airports. After drawing your course, examine the terrain and airspace along your route. You may find that you need to alter the course. Also, this examination is the first step in developing situational awareness about your flight. Are there airports along your route of flight that are suitable for diversion? Are there any types of special use airspace, MTRs, parachute operations, wilderness areas, obstructions, or other unique features?
Identify Checkpoints	Checkpoints should be clearly identifiable landmarks along your route of flight, spaced every 10-20 miles. Try to pick checkpoints that you'll be able to see from your previous checkpoint, as this will give you an object to point the airplane towards in-flight. Airports can also make great checkpoints because they'll help you learn how to spot airports in flight, and they help you maintain situational awareness of your closest alternate airport. As you approach your destination airport, you should identify a 10 NM and 5 NM checkpoint to aid you in identifying the airport. They will also serve as triggers for making radio announcements at a uncontrolled field, or establishing contact with the tower at a tower controlled field.
Measure Distances and True Course	Using your navigation plotter, determine the true course along your course line, and measure the distances between checkpoints. Enter these values in the navigation log, and total the distances.
Obtain winds aloft	You can obtain a weather briefing from LMFS/DUAT/DUATS or look up just the Winds & Temps Aloft for the Pacific Coast. Find the reporting stations along your route of flight. If you unfamiliar with the station identifiers, searching for the identifer using flight planning website such as AirNav.
Determine cruising altitude	The optimum cruise altitude for any flight depends on a number of factors. • **Obstacle Clearance** – Compare the field elevation of your departure airport, destination airport and all terrain and obstructions 10 miles each side of your planned course to determine the height of the tallest obstruction. Add 2000 ft to this altitude. This is your minimum safe altitude that will ensure obstacle clearance, give you a few miles of glide range if the airplane experience engine failure, and will help you see checkpoints and your destination airport. This is a minimum altitude, not the optimum altitude. • **Winds Aloft** – Compare the true course for your flight with the winds aloft. Recall that the winds aloft are aligned with true north. Determine if specific altitudes have a favorable headwind or unfavorable tailwind. Generally, winds will increase as you climb. If flying against a headwind, stay low; if flying with a tailwind, climb and take advantage of the 'free' groundspeed. • **Fuel Burn vs TAS** – Using the Cruise Performance table or chart in Chapter 5 of your airplane's flight manual, determine the optimum altitude by comparing fuel burn to TAS. Generally, cruise power settings are between 65-75% BHP (brake horsepower), TAS increases as altitude increases due to the reduction in drag due to decreasing air density, and normally aspirated airplane engines cannot develop 75% BHP above 8500 ft due to the reduction in air density (and thus oxygen) at altitude. Generally, 8500 is going to be the most efficient altitude for a normally aspirated engine, balancing the highest TAS with least amount of fuel burned per knot of TAS. • **VFR cruising altitude** – 14 CFR 91.159 requires use of a VFR cruising altitude when 3000 AGL or higher and in cruise flight. Select an even altitude + 500 ft for a magnetic course between 180-359°, and an odd altitude + 500 ft for a magnetic course between 350 and 179°.
Convert True Course to Magnetic Course	Look for an isogonic line on the sectional chart closest to the drawn course. For long flights, its possible that you'll fly over multiple isogonic lines, and will need to use different magnetic variations. Recall that westerly variations are added to the true course to convert to magnetic course, and easterly variations are subtracted from the true course to convert to magnetic course. Easterly variations are found west of the agonic line, because magnetic north lies east of true north from any position west of the agonic line. Westerly variations are found east of the agonic line, because magnetic north liest west of true north from any position east of the agonic line. The memory aid 'West is best, East is least' can be used to recall this.
Calculate Wind Correction Angle (WCA) and Groundspeed (GS)	Use the wind side of your flight computer to determine the WCA and GS for each leg. See Using the E6-B Flight Computer for assistance in calculating the WCA and GS
Correct for Magnetic Deviation	Magnetic fields in the airplane affect the compass's accuracy, and the magnitude of the error may vary depending on the orientation of the airplane. Each compass installation must be calibrated and deviation card is produced to inform the pilot of the expected error. The deviation card is typically located in a holder next to the compass. During your preflight planning, you'll need to make a copy of this course.
Calculate Estimated Time Enroute (ETE)	Using the computer side of the E6-B, we'll solve a Rate-Time-Distance problem to determine the amount of time it will take to fly each leg at the calculate groundspeed.
Calculate Top of Descent (TOD)	There are two approaches to planning when to initiate a descent. First, determine the amount of altitude that you'll need to lose to descent from your cruise altitude to your destination's field elevation. Then select one of the two methods below: **Method 1: Variable ROD, approx. 3° Slope** Altitude to lose / 300 = miles out to start your descent Groundspeed * 5 = Rate of Descent **Method 2: Constant 500 FPM ROD**
Calculate Fuel Burn	Using the computer side of the E6-B, we'll determine the fuel requirements for each leg. Refer to the Using the E6-B Flight Computer guide for assistance in solving fuel burn calculations.
Total Distance, Time and Fuel Columns	To understand the total distance, time and fuel, sum up each column and enter it at the bottom of the navigation log table.

information from: https://max.aero/flight-training/private-pilot-training-program/learning-center/complete-a-navigation-log/

Calculate CAS (from IAS/TAS)

1. Find IAS: Read the airspeed indicator in the cockpit.
2. Correct for Instrument Error (to get CAS):
   - Refer to your aircraft's Pilot's Operating Handbook (POH) or performance charts for specific corrections at different IAS and flap settings
   - For simple estimates, at lower altitudes and speeds (under 200 knots/10,000 ft), IAS often closely approximates CAS.
3. Calculate TAS (from CAS using an E6B/Calculator):
   - Set your pressure altitude opposite the outside air temperature (OAT) on the E6B's altitude/temperature computer.
   - Find your CAS on the inner scale; the corresponding speed on the outer scale is approximately your TAS (or vice versa).
4. Use Rule of Thumb (TAS from CAS): Add 2% to your CAS for every 1,000 feet of altitude (e.g., at 5,000 ft, add 10% to CAS) to get a rough TAS.

Basic Formulas (D = R × T)
- Distance: Speed (Rate) × Time (e.g., 300 miles = 60 mph × 5 hours).
- Time: Distance ÷ Speed (e.g., 100 miles / 50 mph = 2 hours).
- Speed: Distance ÷ Time (e.g., 300 miles / 5 hours = 60 mph).
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Fuel Calculations (Fuel Efficiency)
- Fuel Consumption (e.g., MPG): Total Distance ÷ Total Fuel Used (e.g., 300 miles / 10 gallons = 30 MPG).
- Fuel Burn (e.g., Gallons per Hour - GPH): For aircraft, this is often a rate. If a plane burns 8 GPH:
  - Fuel for a trip: GPH × Time (e.g., 8 GPH × 2.5 hours = 20 gallons).
  - Time at a certain burn: Fuel available ÷ GPH.

Pressure Altitude = (Standard Pressure - Current Pressure)1000 + Field Elevation
Standard Pressure = 29.92

Density Altitude = (OAT - ISAT)120 + Pressure Altitude
ISAT = 15°

Calculate estimated time enroute (ETE)
- Time (hours) = Distance (NM) ÷ Speed (Kts)
- Multiply the time by 60 to get time in minutes

Calculate and record top of descent (ToD)
- Distance (NM) = Altitude loss ÷ Rate of Descent × speed ÷ 60

TC -/+ Variation = MC
TC -/+ WCA = True Heading (TH)
TH -/+ Var = Magnetic Heading (MH)
MH -/+ Dev = Compass Heading (CH)