IFR Cross Country Flight Planning Guide

Day before the flight*:* Gather current low enroute charts, approach charts, Chart Supplement, navigation log, POH performance data, flight computer, etc.

1. **Destination Airport:**
   - **Weather:** Can you and do you want to go based on current and forecast data? Which approach does the wind, ceiling and visibility dictate is most likely? Which runway is best for landing with a headwind?
   - **Approach plates:** Review the minimums for straight-in and circling. What are your approach navigation options (VOR, ILS, GPS) and which is your aircraft equipped with? What are the options for getting established on the approach (i.e. IAFs or feeder routes near your anticipated direction of arrival)? Based on forecast weather (wind, ceiling, visibility), which approach do you expect or want? Are there nonstandard alternate or takeoff minimums; if so, review these.

2. **Enroute:** Select your route from the IAF/feeder route back to your departure airport. Based on your anticipated approach, where does your IAF or feeder route connect to the low enroute chart? Now work backward to departure airport and consider the following:
   - **Preferred routing:** Published in the Chart Supplement are a list of Preferred Routes. You can also find recently cleared and recommended routes in most flight planning apps. ForeFlight has a Route Advisor in the Flight Plan section under "Routes." This is useful in knowing what you are *likely* to receive for a clearance.
   - **Altitude(s):** Review the MEAs, MRAs, MCAs, and OROCAs along your selected route. Altitude is based on your magnetic course – MC of 000 through 179 require an odd altitude (5000, 7000, etc.) and MC of 180 through 359 require an even altitude (4000, 6000, etc.) Are you able to fly these altitudes without icing or performance issues (minimum climb of 500 fpm)? If not, are there optional routes with lower minimum altitudes that you are able to choose? If you lost communication, would you be able to hold an altitude or need to continually climb/descend?
   - **Airspace:** Avoid prohibited, restricted airspace and TFR.
   - **Terrain:** Make sure you are familiar with terrain along your route and near your departure and destination airports. Review the MSAs for both as well.

3. **Departure Airport:** Are there departure procedures (SID or ODP)? Where (which fix) do we want to connect to the enroute phase? If there is no DP, are we expecting radar vectors?
   - **Climb requirements:** Are there minimum climb requirements? If not, what airspeed and climb rate do we need to meet the default climb requirement of 300' per NM?
   - **Turns:** At what altitude (MSL) do we begin our turns? If an altitude is not published, use the default of 400' AGL.

4. **Alternate:** Based on the forecasts at your ETA, are you required to file an alternate (1-2-3 rule)? If the weather *anytime* around your ETA is possibly IMC, I recommend filing an alternate to be more prepared (flight planning in the air in IMC is tough, especially if you are worried about fuel)!

5. **Fuel:** Do you meet the requirements of FAR §91.167? At what fuel indication would you divert for fuel? How much are you landing with? Does your destination have fuel services and available 24 hours? Do you have any fuel options along your route and what is the weather forecast there?

6. **Required Equipment:** Is your aircraft equipped with the navigation necessary for the departure, route, and approach you selected? Do you meet the VFR, IFR, DAY (and NIGHT if applicable) requirements of FAR §91.205? Have you verified AROW and that all required manuals are on board? Is your GPS up-to-date? Are your charts current? Was your last VOR check within 30 days? Is your altimeter current within 75'?

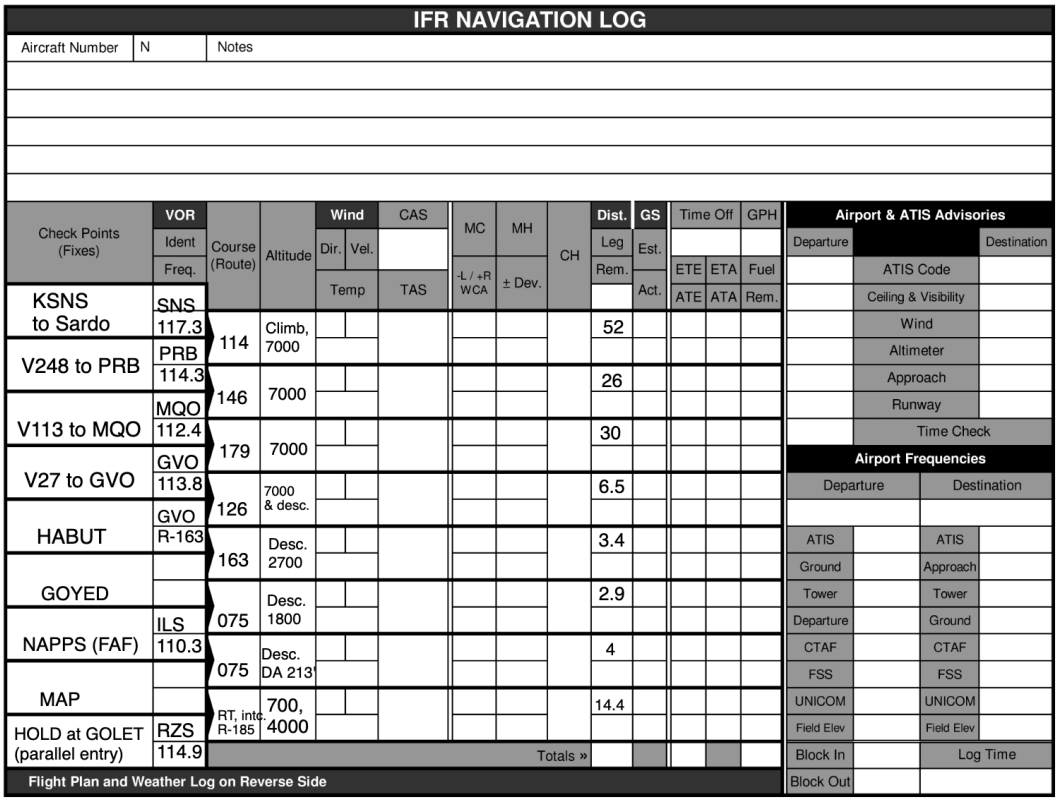
7. **Pilot Currency:** Review FAR §61.57(c) regarding instrument currency.

8. **Emergencies:** Always have an "out" along the route. Weather can deteriorate, ice can happen, instruments can fail, and it's best to be prepared to divert. In case of an instrument malfunction or engine issue, where is the nearest VFR option?

9. Fill out as much of the navigation log as you can. On the day of departure, we will enter wind to calculate heading, ground speed, time, and fuel.

First, remember that this log is for ***your*** use. No sense in filling it with so much info it is unreadable. Second, flight planning is done primarily to calculate fuel, time, and distance and to familiarize you with route, airspace, and alternate airport options.

Here is an example of the way I plan an IFR flight. If an alternate is indicated, I would make a separate flight plan from the hold to the alternate airport, including the alternate approach details. This is to ensure I am familiar with the approach at both destination and alternate, and I calculate fuel as closely as possible. Many people forget the fuel consideration to shoot an approach and go missed, especially if they only plan direct to an airport. I recommend planning the most likely route, but have enough fuel for the longest route. That way, if you get shortcuts you have extra fuel, rather than get an amended route or hold and now having to worry about fuel.



IFR NAVIGATION LOG

Aircraft Number	N	Notes

Check Points (Fixes)	VOR Ident / Freq.	Course (Route)	Altitude	Wind Dir. / Vel. / Temp	CAS / TAS	MC / -L / +R WCA	MH / ± Dev.	CH	Dist. Leg / Rem.	GS Est. / Act.	Time Off / ETE / ATE	ETA / ATA	Fuel / GPH Rem.
KSNS to Sardo	SNS 117.3	114	Climb, 7000						52				
V248 to PRB	PRB 114.3	146	7000						26				
V113 to MQO	MQO 112.4	179	7000						30				
V27 to GVO	GVO 113.8	126	7000 & desc.						6.5				
HABUT	GVO R-163	163	Desc. 2700						3.4				
GOYED		075	Desc. 1800						2.9				
NAPPS (FAF)	ILS 110.3	075	Desc. DA 213'						4				
MAP		RT, intc. R-185	700, 4000						14.4				
HOLD at GOLET (parallel entry)	RZS 114.9												
									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			

-The top section can be used for performance data, clearances, or any other data you need to remember.

- Check Points: Your departure airport should be the first checkpoint. A check point should be listed any time there is a change in course direction, a crossing restriction, a change-over-point, VOR, or any other important fixes.

- VOR Freq/Ident: If you are using VORs for navigation, either on airways or as checkpoints, enter the VORs ID (name) in the top half of the box and the frequency in the bottom half of the box.

- Course: Magnetic course is the track we fly over the ground. It determines our altitude and is also what VORs display. Magnetic course is the course information (i.e. radials and routes)given on all IFR charts.

- Distance: List the distance between each check point. These are given as nautical miles on charts.

Day of the flight:

1. Go to www.aviationweather.gov. Under the "Tools" tab, select "Standard Briefing" and review all.
2. Use METARs, TAFs, and Winds Aloft to calculate takeoff, climb, en route and decent performance, WCA, and GS.
   * Remember that winds aloft are given in True direction and in Knots. Convert wind direction to magnetic before determining WCA, and if your airplane's airspeed is given in MPH, I suggest converting it to KTS when entering it into flight planning data.

3. Refer to NOTAMs, TFRs, GFA, Prog charts, AIRMETs, SIGMETs, Convective SIGMETs, PIREPs, and TAFs to make a go/no-go. Just because you can legally fly doesn't always mean you should.

4. Calculate when/where TOC will occur and complete flight plan boxes for ground speed, time, fuel burn, and magnetic heading. Calculate when you want to begin a decent for the approach.

5. Once you have determined Mag Heading (MH) and know which airplane you will fly, calculate Compass Heading (CH) by applying Deviation from the "Compass Deviation Card" of that airplane.

6. Complete a Performance Sheet and Weight & Balance for each flight plan.

7. Calculate Groundspeed, CH, MH, time between waypoints, time enroute, fuel consumption, fuel required, etc. Note which power setting (RPM) you selected for cruise so you set it in flight.

8. Highlight your route of flight on the Low Altitude Enroute Chart. Circle any crossing restrictions or changes in MEA in a different color.

9. Double check everything! Does the information in your nav log match the data from your charts? Review any special considerations like NOTAMs for inoperative lighting, changes to approaches, etc.

10. File your flight plan and obtain a weather briefing.

11. Make sure you and your airplane are airworthy and current before beginning a flight.

FARs to consider for IFR
FAR §91.167: Fuel for IFR
FAR §91.169: IFR Flight plan
FAR §91.171: VOR check
FAR §91.173: ATC clearance
FAR §91.175: Takeoff & landing under IFR
FAR §91.177: Minimum altitudes
FAR §91.179: IFR altitudes
FAR §91.181: Course to be flown
FAR §91.183: IFR communications
FAR §91.185: Lost communications
FAR §91.187: Malfunction reports
FAR §91.205: Instrument & equipment requirements
FAR §91.211: Supplemental oxygen
FAR §91.213(d): Inoperative instruments & equipment without an MEL

FORMULAS

How to calculate a VDP: Height Above Touchdown (HAT) / Descent Rate = VDP Distance from RWY.

Ex: HAT = 600ft and normal rate of descent is 300ft/nm, so 600/300 = 2 nm. VDP is 2 nm before the runway. Add or subtract this 2 nm from the distance from the runway (VDP = Runway threshold + VDP distance from runway) listed on the profile view of the approach plate.

How to calculate a descent: To quickly calculate TOD using the 3-degree angle, determine how much altitude you need to lose (let's we are at 7000 ft and need to descend to 3100 ft, for a total altitude loss of 3900 ft) and divide that by 300 (3900/300) which equals 13. You would need to begin your descent at least 13 nm out.

How to calculate descent rate: A quick method to calculate rate of descent is to take your ground speed, and divide it in half, then add a zero. For example, if your ground speed is 90 KTS, dividing by 2 equals 45, add a 0 to the end = a descent rate of 450 fpm. If you were going 120 KTS, your descent rate should increase to approximately 600 fpm. **GS/2, then add zero to the end**

TH = TC +/- WCA
MH = TH +/- VAR
CH = MH +/- DEV
MC = TC +/- VAR

Wind adjustment converts course to heading.
Variation adjustment converts true to magnetic.
Deviation adjusts for errors in the compass caused by airplane systems.