Point A to Point B

Flight Planning

Cross country flying is one of the most enjoyable aspects of the flying adventure. Flying from Point A to Point B may even be more enjoyable than the time spent at Point B. For many, it's the trip, not the destination. Proper flight planning will enhance the enjoyment of the trip and may well prevent it from becoming a very bad experience.

Flight planning can be divided into four phases: Preparation, Departure, Enroute and Arrival. Each phase has topics that must be checked, calculated, reviewed and complied with. Allowing time for this process enhances completeness and accuracy. Thorough flight planning will result in a safer trip.

This month the Preparation and Departure phases will be discussed.

Preparation

Preparation is the first step in cross country flight planning. It begins days before the flight, rather than hours. The objective is to develop the big picture of the flight. The process begins with the selection of a destination, the route and checkpoints along the route. For this discussion, the destination, Point B, is your final destination or your first stop, whichever you will arrive at first. This flight could be the first leg of a multiple leg trip.

Airport/Facility Directory (A/FD)

Use the Airport/Facility Directory to check the destination airport. Field elevation, runway length & orientation, calm wind runway, noise abatement, fuel services, FBO hours of operation and ground transportation will be items of interest at Point B. The A/FD also includes frequencies, phone numbers (AWOS), traffic pattern altitude & direction and lighting information. Review all of the information as it pertains to your category of aircraft and pilot needs in advance of the flight. The intent is to minimize surprises upon arrival.

Airport/Facility Directories can be purchased from the government over the internet and from private companies.

Links to Airport/Facility Directory for purchase:
- US Government – www.naco.faa.gov/index.asp?xml=naco/catalog/charts/supplementary/af_directory
- Flight Guide – www.flightguide.com
- mypilotstore.com – www.mypilotstore.com/MyPilotStore/chart/FAA_Airport_Facility_Directory.asp

- JoePilot.com – www.joepilot.com/items.asp?Cc=AFD&iTpStatus=0&Tp=&Bc

Links to online Airport/Facility Directory:
- US Government – www.naco.faa.gov/index.asp?xml=naco/online/d_afd
- AOPA (membership required) – www.aopa.org
- Aeroplanner.com – http://map.aeroplanner.com/mapping/chart/aptsel.cfm
- AirNav – www.airnav.com
- My AFD (beta) – www.myafd.com/airport

Sectional Charts

Using a current sectional chart is a safety element and required by the CFRs. Frequencies, elevations and other data changes over time. Airspace depiction can only be found on the sectional chart. Review the "Legend" for symbols that are used. Check the "Obsolete for use in Navigation" date on the chart. Make sure the chart is current! Sectional charts can be purchased at most airports or over the internet.

Purchase Sectional Charts:
- mypilotstore.com – www.mypilotstore.com/MyPilotStore/chart/FAA_VFR_Sectional_Charts.asp
- JoePilot.com – www.joepilot.com/items.asp?Cc=Sectionals&iTpStatus=0&Tp=&Bc

View the Sectional Charts:
- Aeroplanner.com – www.aeroplanner.com/tools/dlcharts.cfm?tab=sectionals
- SkyVector.com – www.skyvector.com.

Plotting the Course

Plot the route on the appropriate sectional chart by drawing a strong line from your departure airport, Point A, to your destination airport or airport of first landing, Point B. A strong line on the sectional will make locating your position while navigating (pilotage) easier. Measure distances & courses to your checkpoints & destination and enter them in the navigation log.

Navigation Log

The next step is entering the course, checkpoints and distances in the navigation log. The aircraft flight characteristics, including range, airspeed and fuel consumption

rate should be noted. Using a no wind condition, you can make an initial estimate of the time and fuel required for the trip. If the calculations show that distance to the destination is not within the range of the aircraft, plus a reserve of one hour, change the initial destination and plan for a flight of multiple legs. More about one hour reserve later.

You can make your own custom navigation log, copy one from your ground school text book or use flight planning software. In any case, all of the key information should be entered, calculated and reviewed.

Sample Navigation Log:
• FirstFlight – www.firstflight.com/extras/FFnavlog.pdf

Airspace

Next, review the airspace that your course will take you through. Do you, the pilot, have the necessary training and endorsements for the airspace you intend to fly through? Does the aircraft have the communications and navigation equipment required by the airspace? If not, you may have to alter your course to avoid airspace that you or the aircraft are not qualified for. Specifically I am speaking of the communications and endorsement requirements of Class B, C and D airspace the transponder requirements of Class C and B airspace and the surrounding area.

Airspace Review for pilots:
• AOPA – https://www.aopa.org/forms/content/
?priority=FX07WP1PP&keyword=ppairban0707

Special Use Airspace (SUA)

Reviewing the sectional chart, look for Special Use Airspace (SUA) that your course may cross or come close to. Prohibited, Restricted, Military Operating Areas (MOA), Alert areas that are active will require you to alter your course. Not all SUA is active all the time. Check for SUA activity on the anticipated date of your flight. If the airspace is not active, you can transition that area without permission or communication with the controlling agency. If the SUA is active, permission may be required from the controlling agency before entering. Make sure of the status well before nearing Special Use Airspace.

Special Use Airspace (SUA) Status:
• US Government – www.sua.faa.gov
• Flight Service – 1 800 WX BRIEF
Special Use Airspace (SUA) Review for pilots:
• AOPA – https://www.aopa.org/forms/content/
?priority=FX07WP1PP&keyword=ppairban0707

Temporary Flight Restrictions (TFR)

Temporary Flight Restrictions are now a way of life for all pilots. Even in the preparation phase, check for TFRs along your route of flight. Some TFRs are known in advance and made available to pilots. Other TFRs may not be known until the day of flight or even after departure. On the day of flight, check TFRs as part of the Standard Briefing from Flight Service, (1 800 WX BRIEF.) Sporting events, forest fires, air shows and VIPs traveling account for most of the TFRs. As the election season draws closer, more flights will be made by VIPs, resulting in more TFRs.

TFR Status:
• US Government – www.tfr.faa.gov
Flight Service – 1 800 WX Brief
TFR Review for pilots:
• AOPA – https://www.aopa.org/forms/content/
?priority=FX07WP1PP&keyword=ppairban0707

Weather & Forecasts

As you fly longer distances from your home airport there is a higher probability that the weather will change during the flight. Checking current weather and the forecast is necessary in order to anticipate changes that could affect the safe completion of your flight.

For flight preparation, the long term weather forecast and trends should be consulted. You are looking for the big picture. Note the weather systems that will move into or out of your planned route of flight. Forecasts of storms, low visibility and high winds may be reasons to alter your flight plans. Seven, five and three day forecasts are available on the internet. The Weather Channel has national and regional seven day forecasts available. Five day forecasts of local weather can be found at Weather Underground. Enter your zip code to get started.

Both weather sites give general, non aviation forecasts, but the information will allow us to make long range decisions. Many other weather sites are available for long range forecasts and weather trends. Choose the site you like and use it.

Long Range Forecasts - National & Regional:
• The Weather Channel - www.weather.com/maps/
weeklyplannerusnational.html
Five Day Forecasts – Local:
• Weather Underground - www.wunderground.com

Flight Planning Software

Flight planning software is available on the internet and as a program that runs on you desktop, laptop, PDA and now cell phone. The program will plot the course & measure distances; gather weather & winds aloft; and calculate headings, flying times and fuel burn. Examples can be found below. www.aeroplanner.com, www.rmstek.com and www.hiltonsoftware.com. EAA and AOPA have flight planning software available for their membership. In addition, there are many other flight planning programs and internet sites available. Try them all. Find one that you like. Use it to do the number crunching and information (weather) retrieval.

Flight Planning Software:

- AeroPlanner.com • www.aeroplanner.com On the internet
- RMS Technology - www.rmstek.com   Desktop/Laptop
- Hilton Software - www.hiltonsoftware.com PDA/Cell phone

Weight & Balance

Calculate the Weight & Balance for your trip. The gross weight, empty weight and center of gravity for the aircraft you will be flying can be found in the Pilot Operating Handbook (POH). A W&B worksheet, calculation tables and examples are also available. Knowing the empty weight of the aircraft, the weights of the pilot, passengers, baggage and fuel quantity on board, the takeoff weight can be calculated. Check to make sure that you do not exceed the Gross Takeoff Weight or the Center of Gravity Limits as published in the POH.

These calculations can be done during the preparation phase to estimate your expected W&B. Actual weights should be used for your calculations on the day of flight.

Weight & Balance Calculator:
- Aeroplanner.com - http://www.aeroplanner.com/calculators/wandb.cfm

GPS

Planning to take a GPS with you? The preparation phase of flight planning is the best time to program your GPS. Rather than push a lot of buttons just before you preflight the aircraft or worse yet, while you are enroute, do it now. You have the comfort of your favorite chair while trying to figure out why the last 3 buttons pushed didn't do what you wanted or what the destination airport identifier really is.

Enter your departure airport, destination and waypoints (checkpoints.) Save the route with a name you will remember. Recheck all entries.

If your GPS has an internal aviation database, check the date of the data. If the database is out of date, load the current data via internet connection.

While using a GPS, remember that your primary navigation tool the sectional chart (pilotage) and your source of airspace information is also the sectional chart. The GPS should only be used as a secondary navigation tool. Batteries can and do go bad and handheld GPS units have been lost while enroute.

Emergency Procedures

Review the emergency procedures for your aircraft. They can be found in the Pilot Operating Handbook (POH). Take the opportunity to review them now while things are quiet.

Checklists

If the aircraft you are flying does not have a set of checklists, now is an opportunity to purchase a set or develop your own. Preflight, Engine Starting & Taxi, Engine Run up & Departure, Landing and Emergency are the basic checklists. You may find

them in the POH. Checklists are there to help you remember what you otherwise might forget. Use them.

Aircraft Logbooks & Required Documents

Although the cross country flight is no different than any other flight, take a moment to review the paperwork for the aircraft you will be flying. Annual Condition Inspection, 100 hour Inspection and AROW (airworthiness certificate, registration, Operations limitations, weight & Balance) should be current and in the proper place. Not all are required in the aircraft, but have to be available.

Even though you may not be the aircraft owner, as PIC you are responsible for making sure the required paperwork is in order prior to your flight.

Departure

The departure phase of flight planning begins on the day of the flight and continues to the first checkpoint. Information that was gathered during the preparation phase will be reviewed, updated and actual conditions entered into the navigation log or flight planning software and weight & balance calculations.

Weather & Forecasts

Check actual and forecast weather conditions at the departure airport, destination airport and enroute for the estimated flight time. Make sure the ceiling & visibility are at or above legal minimums, your personal minimums and are forecast to stay above those minimums. In addition, check that surface winds will not exceed your capability. Check or calculate density altitude for aircraft performance and runway length. Use the winds aloft forecast to calculate ground speed. With speed/distance calculations, determine the flight time (plus 1 hour) and fuel required. This is the second check to assure that the destination airport is within the range of the aircraft and that you will have enough daylight to arrive safely. If the numbers do not work, shorten the distance for this leg of the trip by selecting a new destination airport that is still along or close to your intended path of flight. There are no awards for using every drop of fuel or rushing to get to a destination.

Aviation weather websites should be used to check current conditions and forecasts on the day of the flight. Flight planning software may have built in links to assist in the process. FAA official weather briefing sites include DTC DUAT, CSC DUATS, WeatherTap and Flight Service. Although not considered official briefing sites, other internet sites may have a high accuracy and easy to use formats. They may serve as a source of weather information to supplement an official briefing.

Live radar (approximately 6 minuets old) is now available at many websites. In the case of weather, having a picture is truly

worth a thousand words. Utilize the live radar sites to develop the big picture.

Find weather websites you like and use them. Be they free of charge, subscription or membership required, they all have valuable information for flight planning.

Official FAA Flight Briefing sites:
• DTC DUAT - www.duat.com
• CSC DUATS - www.duats.com
• WeatherTap - www.weathertap.com
• Flight Service - 1 800 WX BRIEF
Internet Weather Sites:
• US Government - www.aviationweather.gov
• Air Sports Net - www.usairnet.com
Live Radar Sites:
• US Government - http://radar.weather.gov
• Weather Underground - www.wunderground.com/radar/map.asp
• WeatherTap - www.weathertap.com

Winds Aloft Forecast

Winds at the cruising altitude directly affect ground speed and thus impact the flight time and fuel consumption. Use the Winds Aloft Forecast to choose a cursing altitude that optimizes groundspeed. If your cruising altitude is predetermined, use the winds aloft for that altitude in your calculations. The Winds Aloft Forecast can be obtained from Flight Service. The briefer will use the forecast that coincides with your time of flight.   Winds aloft are harder to locate on the internet and may not current.

Winds Aloft Forecast:
• Flight Service - 1 800 WX BRIEF

Navigation Log

Enter the winds forecast for the chosen altitude into the navigation log and calculate flight times to each checkpoint and the destination. Based on the times, calculate the fuel required. Review the entire navigation log. Do you have enough fuel onboard the aircraft, at the beginning of the flight, to fly to the destination airport and have a minimum of one hour fuel reserve?

Based on your estimated departure time and calculated flight time, will you arrive at Point B before your desired arrival time or sunset, whichever is earlier? (Sunset allows a time buffer before evening civil twilight). If you cannot answer YES to both questions, rethink your departure time, destination and/or route.

Do not depart if you can not arrive within conservative estimates of time and fuel.

Leave yourself an out.

TFR & SUA

Check the TFR and Special Use Airspace information for your route. The status of both can be obtained from Flight Service. During the Preparation phase, you were looking at the big picture. Now you are checking the airspace status for the time you will be in flight. Allow an ample time buffer on both the starting and ending times of TFRs and SUA activity. A TFR is not over until it's over. If the dignitary is running late, the TFR remains active until the dignitary leaves the airspace, regardless of the published ending time. Better not to have a visit from an F16.

If you are intercepted by a military aircraft, tune your radio to the Emergency Frequency (121.5) and comply with all instructions. If you do not have a radio, follow the intercept procedure and signals. The interception procedure and aircraft to aircraft signals can be found in the Aeronautical Information Manual, chapter 5-6-2.

Review Airspace Status:
• TFR - www.sua.faa.gov
• SUA - www.tfr.faa.gov
• Flight Service -1 800 WXBRIEF
Intercept Procedure:
· Aeronautical Information Manual -
www.faa.gov/airports_airtraffic/air_traffic/publications/atpubs/aim/

A/FD

Recheck the airport data for the departure and destination airports in the Airport/Facility Directory. With density altitude information available, recheck runway lengths. Review the airport diagram for orientation and location of runways, taxiways and facilities. Airport information that has changed since the last publication of the A/FD will be updated by NOTAM.

Chapter 12—Airport Operations
• Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25
http://www.faa.gov/library/manuals/aviation/pilot_handbook/media/faa-h-8083-25-3of4.pdf

NOTAM

NOTAMs for the departure and destination airports can be received as part of the Standard Briefing from Flight Service. NOTAMs advise the pilot of airport facilities, lighting and navigational aids that are out of service, closed or otherwise changed since the last publication of the Airport/Facility Directory.

Published NOTAM:
• www.faa.gov/airports_airtraffic/air_traffic/publications/

notices/2007/NTAP07AUG30/
NOTAM
• Flight Service - 1 800 WX BRIEF

Flight Briefing

A flight briefing can be obtained on the day of flight from Flight Service. The standard briefing includes current and forecast weather for the departure and destination airports and along your route of flight. The briefer will advise on winds aloft, NOTAMs, TFRs, pilot reports.

For a telephone briefing, identify yourself as a pilot and request a Standard Briefing. The briefer will request the following information from you:

1. Is the flight is visual flight rule (VFR) or instrument flight rule (IFR)
2. Aircraft identification and type
3. Departure point
4. Estimated time of departure (ETD)
5. Flight altitude
6. Route of flight
7. Destination
8. Estimated time en route (ETE).
Chapter 11 - Weather Reports, Forecasts, and Charts
Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25

"When VFR flight is proposed and sky conditions or visibilities are present or forecast, surface or aloft, that in the briefer's judgment would make flight under visual flight rules doubtful, the briefer will describe the conditions, affected locations, and use the phrase *"VFR flight not recommended."* This recommendation is advisory in nature. The final decision as to whether the flight can be conducted safely rests solely with the pilot." AIM 7-1-4-2

Although much of this data is available on the internet, Flight Service is an official source and the briefer can add commentary and answer your questions. Flight Service is the only official source for TFRs. The preflight briefing is outlined in the Aeronautical Information Manual Chapter 7-1-4. The call to Flight Service is also an opportunity to file a flight plan.

Chapter 11—Weather Reports, Forecasts, and Charts
• Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25 - http://www.faa.gov/library/manuals/aviation/phandbookilot_handbook/media/faa-h-8083-25-3of4.pdf

Aeronautical Information Manual Chapter 7: (link & scroll down)
• http://www.faa.gov/airports_airtraffic/air_traffic/publications/atpubs/aim/Chap7/aim0701.html#7-1-4
Note
On the day of departure I gather most of the required information over the internet and then call Flight Service. The Standard Briefing confirms my planning and I make sure TFRs are discussed. It never hurts to have a second weather review

for long trips and when conditions are forecast to be marginal.

Flight Plan

With the preparation work checked and updated with actual data and the navigation log completed, an FAA Flight Plan can be filed. All of the required flight plan information is known by the pilot or taken from the navigation log. After the standard briefing by Flight Service, you can file the Flight Plan with the briefer. As an alternative, a flight plan can be filed at one of the official FAA briefing websites. Remember to activate the flight plan after departure and within one hour of filing the Flight Plan.

Flight Plan Form
• http://forms.faa.gov/forms/faa7233-1.pdf.
• Additional Flight Plan Form Information - www.eglinaeroclub.com/forms/FAA%20Flight%20Plan.PDF

Aircraft Performance

Calculate the Weight & Balance for the aircraft you are flying using the actual weights of people, fuel and baggage. Assure yourself the aircraft, as loaded, is under its maximum gross weight and within the center of gravity limits.

Calculate the Density Altitude and review runway requirements at the departure and destination airports. Assure yourself that you have more than enough runway length for the density altitude at the time of your flight. Mid day temperatures can have a considerable affect on aircraft performance.

Cross winds may also be a consideration if the destination airport has only one runway. Leave yourself an out.

Chapter 9—Aircraft Performance (link & scroll down)
• Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25 - http://www.faa.gov/library/manuals/aviation/pilot_handbook/media/faa-h-8083-25-2of4.pdf

GPS

Enter any last minute changes to the route or waypoints. Save the updated route. Check the batteries and the date of the database.

Additional Equipment/Plans

Depending on the length of the trip and the terrain, you may want to include some additional planning and equipment.
Cell phone:
Carrying a cell phone as a backup/emergency communication tool is a good idea. However, do not depend on coverage from your carrier. It's all in the network, but the network is not everywhere.
Water:
Long flights, flights at altitude and hot temperatures can dehydrate a pilot quickly. Carry bottled water with you and drink before you become thirsty.
"Dehydration also can contribute to fuzzy thinking, poor decision-making, dizziness and muscle fatigue. Many soft drinks, teas and juice drinks do not constitute good hydration substitutes as they contain caffeine and sugar that may compromise absorption of the water content. Thirst is not the beginning of dehydration, but a indication that you are already dehydrated." Chapter 15, FAA-H-8083-25
Chapter 15—Aeromedical Factors
• Pilot's Handbook of Aeronautical Knowledge FAA-H-8083-25 -
http://www.faa.gov/library/manuals/aviation/pilot_handbook/media/faa-h-8083-25-4of4.pdf
First Aid / Survival Gear:
A first aid kit is always a good idea. Survival gear is a function of the terrain you will be flying over. The more severe the terrain (mountains & open water) the more critical the need for good survival equipment. If you have any doubts or questions, contact an instructor or high time pilot who is flying over that terrain.
Personal Flight Plan:
Tell someone dependable that you are going flying, your direction of flight and how long you will be gone. They should know about when to expect you back and if they become concerned, who to call.

Transition

Before taxi and after checklist items have been completed, turn the GPS on and select the saved route for navigation. Place the sectional chart and any other navigation aids within easy reach. The navigation aids should not interfere with flying the aircraft.

Before take off and after checklist items have been completed, note the time on your navigation log. Fuel consumption and other calculations will be based on it. Recheck traffic and advise your intentions on CTAF before taking the runway.

The transition from the airport area to your on course heading to the first checkpoint is a very busy time period. Flying the aircraft, scanning for traffic, monitoring CTAF or assigned frequency and orienting your position on the sectional chart makes for a busy pilot. Remember - Fly the Aircraft. Once all is under control, activate your flight plan with Flight Service and proceed to the first checkpoint.

When you arrive at the first checkpoint, note the time on your navigation log. You can use simple time/distance/speed calculations to determine your actual ground speed. Because of the amount of time used for takeoff, climb and maneuvering to your on course heading, the groundspeed to the first checkpoint may be slower than estimated. More accurate calculations will be possible between subsequent checkpoints.

The actual groundspeed will be used to calculate time remaining to the destination. During the enroute phase, actual groundspeed will be updated at each checkpoint. The updates are used to determine the fuel and time required to complete the flight.

Next Month

Next month the Enroute and Arrival phases of flying from Point A to Point B will be discussed. "Leave Yourself an Out" will also be a topic. Until then, you can listen to these and other aviation topics at SweeneyCorp, Audio Presentations.
www.sweeneycorp.com/audio%20presentations.htm

Note

Most of the internet websites have selections (tabs) that offer options and enhanced views. Tab around site and find the settings that suit you. If you do not find exactly what you are looking for, search (Google) on the topic. Additional websites are available for each topic. Experiment and find the internet websites or computer program that you like and use them even though you may not be flying that day. The more you use the flight planning tools, the more you will appreciate their value and find more reasons to use them. Plan well, fly safe.