Point A to Point B

Enroute

In the first part of From Point A to Point B, the Preparation and Departure phases of cross country flight planning were discussed. Preparation includes the time spent researching and planning the trip. Typically done at home, the time is spent well in advance of the flight and includes all aspects of the trip.

The Departure phase includes the time just prior to the trip through arrival at the first checkpoint. This includes the preflight planning done at home and at the airport on the day of the trip. The objective is to update all of the data covered in the Preparation phase for actual conditions. For a review of the Preparation and Departure phases, see From Point A to Point B in the October issue of UltraFlight Magazine. This month the focus is on the Enroute phases of the trip.

The Enroute phase is the time between the first checkpoint and the last checkpoint. This is the longest portion of the cross country, both in time and distance. This may also be the most enjoyable part of the trip as you have an opportunity to view the countryside and enjoy flying. "Fly the Aircraft!" and safety are the first concerns, but you should still have time to enjoy the scenery.

There are, however, some tasks to perform during the Enroute phase. They consist primarily of navigating and reviewing the flight log. Each checkpoint is an opportunity to confirm your location and validate the earlier calculations of time and fuel required to complete the flight.

Checkpoints

As you arrive at the first checkpoint, note the time in the navigation log. As discussed in Part One, simple time/distance/speed calculations can be used to determine the actual ground speed to the first checkpoint. Use the actual ground speed to calculate the time remaining to the destination. Knowing the time remaining, the fuel required can be updated. The question you need to answer at each checkpoint is: Do you have enough daylight and fuel to complete the flight to the destination? If the updated calculations suggest the answer is no, start considering the alternatives. The alternatives will be discussed a little later.

Navigation

- Pilot's Handbook of Aeronautical Knowledge FAA H 8083-25

Chapter 14 – Navigation
www.faa.gov/library/manuals/aviation/pilot_handbook/media/faa-h-8083-25-4of4.pdf

Sectional Chart

The primary navigation tools are the sectional chart and compass. Use the sectional chart to keep track of your progress. Draw your course line on it and note your checkpoints. Mark each checkpoint on the chart as you pass it and make a time entry in the flight log. Take a moment to find points of interest and features located on the ground on the chart. Reverse the process and locate items from the sectional chart on the ground. Not all features on the ground are on the chart and some points on the chart may be hard to locate on the ground. Power transmission lines are a good example. Not all transmission lines you see on the ground are on the chart. The symbol for transmission lines is easily recognizable on the chart, but finding them on the ground can be a challenge.

Review your route on the sectional chart before you leave the ground. Keep track of your position on the chart as you are flying the route.

Sectional Chart

- Pilot's Handbook of Aeronautical Knowledge FAA H 8083-25

Chapter 14 – Navigation
www.faa.gov/library/manuals/aviation/pilot_handbook/media/faa-h-8083-25-4of4.pdf

- Virtual Skies – http://virtualskies.arc.nasa.gov/navigation/tutorial/tutorial8.html

Dead Reckoning

Dead reckoning is navigation based solely on time, ground speed, distance, and direction. A description of magnetic course (MC) and magnetic heading (MH), both components of dead reckoning, can be found in Chapter 14 of the Pilot's Handbook of Aeronautical Knowledge. An understanding of dead reckoning is required for good navigation. Magnetic heading is flown using the compass. Magnetic course is used for cruising altitude decisions.

Dead Reckoning

- Pilot's Handbook of Aeronautical Knowledge FAA H 8083-25

Chapter 14 – Navigation

www.faa.gov/library/manuals/aviation/pilot_handbook/media/faa-h-8083-25-4of4.pdf

Magnetic Compass

The compass is the flight instrument that will help keep you orientated and headed in the correct direction. Check your compass often to confirm that you are holding the correct heading to the next checkpoint.

The magnetic compass has a number of operational quirks. Compass operation and errors are described in Chapter 6 of the Pilot's Handbook of Aeronautical Knowledge. This is good reading to better understand how this simple but very important instrument works.

Magnetic Compass

- Pilot's Handbook of Aeronautical Knowledge FAA H 8083-25

Chapter 6 – Flight Instruments
www.faa.gov/library/manuals/aviation/pilot_handbook/media/faa-h-8083-25-2of4.pdf

Fuel Requirements – Safety Topic

In the Preparation phase, the fuel required for the trip, plus one additional hour of flight, was calculated. At each checkpoint the calculation is updated. Knowing how much fuel was on board at the start of the flight, the burn rate (gph) and the time flown, the fuel remaining in the tanks can be calculated. This calculation should verify what the fuel gauges show. With the updated ground speed, distance remaining and burn rate, the fuel required to the destination can be calculated. The result of all these calculations should be that there is enough fuel remaining in the tanks to arrive at the destination and have a reserve for at least one hour of flight. If the calculations, at any point in the flight, show that there is not enough fuel to arrive at the destination and have a reserve, an alternative plan of action should be flown. Alternative Plan of Action is discussed later.

Although a fuel reserve of one hour is strongly suggested, the CFRs only require thirty minutes for day, VFR flights. Remember – "Because you're legal, doesn't make you safe"

Fuel Requirements

- 14CFR91.151 - Fuel Requirements in VFR Conditions
  www.flightsimaviation.com/data/FARS/part_91-151.html
- 14CFR91.151 - Fuel Requirements in VFR Conditions
  www.airweb.faa.gov/REGULATORY_AND_GUIDANCE_LIBRARY/RGFAR.NSF/0/8333A51DA144CF9E852566CF00618289?OpenDocument
- Pilot's Handbook of Aeronautical Knowledge FAA H 8083-25

Chapter 14 – Navigation
www.faa.gov/library/manuals/aviation/pilot_handbook/media/faa-h-8083-25-4of4.pdf

Sunset

An aircraft may not be operated during the period from sunset to sunrise unless it has lighted position lights. If the updated time of arrival is after sunset and the aircraft does not have position lights, an alternative plan of action should be flown. Aircraft categories include airplane, weight shift, powered parachute and others.

Aircraft Lights

- 14CFR91.209 - Aircraft Lights
  www.flightsimaviation.com/data/FARS/part_91-209.html
- 14CFR91.209 – Aircraft Lights
  www.airweb.faa.gov/REGULATORY_AND_GUIDANCE_LIBRARY/RGFAR.NSF/0/4EFFE4F92B644EBF852566CF00679791?OpenDocument

Night

Sport Pilots are not allowed to operate at night. As a result, the flight should be completed before the end of Evening Civil Twilight, when night begins. If your updated arrival time is at night, an alternative plan of action should be flown.

Night

- 14CFR Part 1 Section 1.1 Definitions - Night
  www.flightsimaviation.com/data/FARS/part_1-1.html
- 14CFR Part 1 Section 1.1 Definitions - Night
  http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgFAR.nsf/0/64EC916CE4EB78F086257384006CAF70?OpenDocument

See and Avoid – Safety Topic

Most of the Enroute phase will be flown straight and level as you navigate from checkpoint to checkpoint. At the same time, other pilots will be navigating to their Point B. At cruising speeds, two aircraft can close the distance between themselves very quickly. As you navigate, you are still responsible to "See and Avoid" other aircraft. Don't become so distracted with the navigation that you forget to scan for traffic. If you have not already reviewed scanning techniques recently, take a minute before the flight to do so.

As you approach another aircraft or they approach you, only one has the right of way. Review 14CFR91.113 Right-of-way rules. The other pilot is expecting you to be familiar with the regulation. As in any right of way situation, if you have the right of way and the other pilot is not yielding, take immediate action and get out of his way. He may not see you.

Midair Collision Avoidance

- US Government
  http://www.alaska.faa.gov/ata/MACA.htm
- AOPA / Air Safety Foundation
  http://www.aopa.org/asf/publications/sa15.pdf

Right of Way

- 14CFR91.113 - Right of way

http://www.flightsimaviation.com/data/FARS/part_91-113.html
- 14CFR91.113 – Right of way
http://www.airweb.faa.gov/REGULATORY_AND_GUIDANCE_LIBRARY/RGFAR.NSF/0/934F0A02E17E7DE086256EEB005192FC?OpenDocument

Operating near Other Aircraft
- 14CFR91.111 Operating near other aircraft
http://www.flightsimaviation.com/data/FARS/part_91-111.html
- 14CFR91.111 Operating near other aircraft
http://www.airweb.faa.gov/REGULATORY_AND_GUIDANCE_LIBRARY/RGFAR.NSF/0/962A5F17CD0CBBB8852566CF00614B41?OpenDocument

VFR Cruising Altitude – Safety Topic

To assist the pilot in collision avoidance, the regulation 14CFR91.159 specifies cruising altitudes for straight and level flight. The rule applies to all aircraft flying more than three thousand feet Above Ground Level (AGL).

Based on the magnetic course you calculated in the preflight planning, your altitude enroute should be flown at an even thousand plus 500 feet or an odd thousand plus 500 feet. Examples:
- On a magnetic course of 0° through 179°, any odd thousand foot MSL altitude +500 feet (such as 3,500, 5,500, or 7,500)
- On a magnetic course of 180° through 359°, any even thousand foot MSL altitude +500 feet (such as 4,500, 6,500, or 8,500)

To fine the magnetic course, use the true course form the navigation log and add westerly variation or subtract the easterly variation. The variation can be found on the sectional chart.

Choice of a VFR cruising altitude should be made during the preflight preparation and may determine the altitude used for the Winds Aloft Forecast. If you elect to change your cruising altitude for any reason (turbulence, stronger than anticipated winds, cloud clearance) you must choose an altitude that complies with 14CFR91.159. Other pilots and air traffic control (ATC) expect that you will comply with this regulation when flying straight and level at more than three thousand feet AGL.

VFR Cruising
- 14CFR91.159 - VFR Cruising Altitude or Level Flight
www.flightsimaviation.com/data/FARS/part_91-159.html
- 14CFR91.159 - VFR Cruising Altitude or Level Flight
www.airweb.faa.gov/REGULATORY_AND_GUIDANCE_LIBRARY/RGFAR.NSF/0/5A982143832AE11A86256E00004F6E35?OpenDocument

Cloud Clearance – Safety Topic

During the Enroute phase you may be tempted to fly close to clouds to maintain a cruising altitude. As you get closer to clouds, your ability to "See and Avoid" traffic is significantly reduced. Although sport pilots are restricted from flying in clouds, pilots on an instrument flight plan are not. The cloud obstructing your visibility may contain another aircraft or obstructions.

Minimum visibility and cloud clearance are in-flight requirements as well as on the ground and are contained in 14CFR91.155. The distances required by the regulation are there to assist in the "See and Avoid" process and enhance safety. They are regulatory minimums. Your personal minimums may be higher.

Cloud Clearance & Visibility
- 14CFR91.155 - Basic VFR Weather Minimums
www.flightsimaviation.com/data/FARS/part_91-155.html
- 14CFR91.155 - Basic VFR Weather Minimums
www.airweb.faa.gov/Regulatory_and_Guidance_Library%5CrgFAR.nsf/0/074608A2FA18B48A86256EEB006704EF?OpenDocument

Enroute Weather

While enroute, the weather could change from the forecast. The longer the flight the higher the probability that something - winds aloft, visibility, suffice winds, cloud heights, etc. will change. A forecast is just that, a forecast. Even the best forecaster can be wrong.

There are a number of sources to update weather conditions along the route of flight and at the destination. AWOS, Flight Watch and Flight Service are a few and to take advantage of them, an aviation band radio is required.

Automated Weather Observation Systems (AWOS) are located at a growing number of airports and may be the most available weather update source. As you passing near an airport along the route of flight, check the sectional chart to determine if they have an AWOS (ASOS, ATIS) located on the field. If so, tune to the frequency and listen to the advisory. Wind direction & velocity, altimeter setting, cloud height, temperature and dew point are transcribed and updated every minute. Reception is within 25 miles of the airport.

Weather updates can also be received by contacting Flight Watch on 122.0 MHz or Flight Service (FSS) on 122.2MHz. Other FSS frequencies may be available and within range. Check the sectional chart and/or the Airport/Facility Directory. Reception can vary depending on the altitude of your aircraft and the location of the transmitter. In general, higher altitude, means better reception.

AWOS, ASOS, ATIS
- Airman's Information Manual (AIM):
4-3-26. Operations at Uncontrolled Airports With Automated Surface Observing System (ASOS)/Automated Weather Observing System (AWOS)
- Airman's Information Manual (AIM):

7-1-12. Weather Observing Programs
- Airman's Information Manual (AIM):
  4-1-13. Automatic Terminal Information Service (ATIS)

Flight Service Stations
- Airman's Information Manual (AIM)
  4-1-3. Flight Service Stations
- AFSS Pilot Information Portal
  www.afss.com/service/?svc=inflight

Communications

Frequencies used for enroute communications can be found on the sectional chart and in the Airport/Facilities Directory. Radio phraseology and techniques can be found in the Aeronautical Information Manual. The key to good radio communications is to listen before you key the mike. You may hear another aircraft request the same information you are about to request. Listening first will also help prevent you from blocking another aircraft's transmission. Practice the call in your mind, then make the transmission.

As a note, the air to air communication frequency is 122.75.

Communications
- Aeronautical Information Manual

Section 2
http://www.faa.gov/airports_airtraffic/air_traffic/publications/ATpubs/AIM/chap4toc.htm

Alternative Plan of Action

The alternative plan of action is the answer to the "what if "question.

At each checkpoint, verify your location, calculate the ground speed. With the ground speed and distance remaining to the destination, the estimated time enroute (ETE) can be calculated. The fuel and daylight required to complete the trip can be calculated using the ETE. All are simple time/distance / speed calculations, but it is very important to update the calculations at each checkpoint.

If any of the calculations yield a result that is not within the estimates of the original plan or your personal limits, it is time to review your alternatives. Do you have enough fuel to complete the trip? Do you have enough daylight to complete the trip? Will the weather remain as anticipated until you reach the destination? Are you experiencing a mechanical problem with the aircraft? What is your alternative plan of action?

Alternatives may include, but are not limited to:
- Changing altitude to increase ground speed
- Altering your course
- Changing the destination to an alternate airport
- Landing at the nearest airport
- Returning to the departure airport

The alternative you choose will depend on the item of concern – fuel, daylight, weather, mechanical or other problems. It is imperative that you have alternatives, select the best alternative for the circumstances and then fly the alternative plan.

Lost

The most common problem during navigation is disorientation. Not knowing your specific location or how to get back on course can be stressful.

Attention to your location and direction of flight as you depart the airport area will get the trip off to a good start. As you navigate between checkpoints, attention to heading and landmarks will keep you on course. Use the sectional chart and mark your progress. Keep yourself orientated.

If you become distracted from the navigation task, you may fly off course. If caught in time the correction to get back on course may be small. If not caught in time, you may loose your orientation to the planned course or be lost.

The first step to re-orientate yourself is to make a 360 degree turn. In the process look for landmarks that are on the sectional chart or that you may have already flown over. This simple process will work in most cases.

If still disorientated after the 360 degree turn, then use the 4-Cs:
- Climb - Climb to a higher altitude and make a 360 degree turn. More landmarks will be visible and radio communication is better at altitude .
- Confess - After climbing and turning, if you are still disorientated, confess to yourself that you may need some assistance. Do not waste valuable time and fuel on this step. If you are lost, ask for help
- Communicate – If not already in contact with Flight Service (FSS) or Air Traffic Control (ATC), use the emergency frequency, 121.5 MHz, to communicate your problem. ATC, FSS, airlines and other pilots monitor the emergency and can assist you. By using the emergency frequency, you are not declaring an emergency. The phrase "PAN-PAN" can be used to indicate that there is a need for assistance and that it is not a life threatening situation. Assistance is the function of 121.5.
- Comply – In response to your radio call, assistance will be offered. If you have communicated your situation accurately, it is suggested that you heed their advice. As Pilot in Command (PIC), you know your exact circumstances and the decision is yours.

Emergency Procedures
- Pilot's Handbook of Aeronautical Knowledge FAA H 8083-25

Chapter 14 – Navigation
www.faa.gov/library/manuals/aviation/pilot_handbook/media/faa-h-8083-25-4of4.pdf
- Airplane Flying Handbook

Chapter 16 - Emergencies

www.faa.gov/library/manuals/aircraft/airplane_handbook/media/faa-h-8083-3a-7of7.pdf

- PAN – PAN – Wikipedia http://en.wikipedia.org/wiki/Pan-pan

Emergencies

An in-flight emergency may include problems with the aircraft, the pilot or passengers. Pilot and passenger difficulties will be covered in the Aeromedical section. Aircraft problems might include malfunction of the flight controls, instruments, engine or airframe. In all cases, there are some basic steps to be followed:

- Fly the airplane! - Do not become so distracted by the problem that you loose control of the aircraft. Remain calm, think things through and act decisively.
- Emergency Landing – If an off airport landing is required, select the location and begin to maneuver toward it.
- Changes in configuration – Did you change something in the aircraft that may have caused the problem? Fuel selector, magneto switch(s), mixture control, and primer are some examples. Correct the change.
- Emergency Checklist – Use the emergency checklist to address the problem and/or prepare the aircraft for an emergency landing.
- Use the 4 C's as described in Lost

o Climb - Climb to a higher altitude if able

o Confess - Acknowledge the problem and the need to correct it. The aircraft can be replaced, people can not.

o Communicate - If not already in contact with Flight Service (FSS) or Air Traffic Control (ATC), use the emergency frequency, 121.5 MHz, to communicate your emergency. Use the term Mayday Mayday Mayday!
If the aircraft has a transponder, change the setting to 7700, the emergency code.

o Comply - In response to your call, assistance will be offered. You best know your exact circumstances, but if you have communicated your situation accurately, you will receive assistance from qualified people. If time allows, it is suggested that you heed their advice.

With the exception of Fly the Aircraft!, always the first response, the exact order of the above steps may vary. If your altitude is low, you may only have time to select a place to land. With a higher altitude, you may have time to fully diagnose the problem before having to select a place to land. Remember to use the emergency checklist. Its use may lead to quick correction to the problem.

Emergency Checklist

- Pilot's Handbook of Aeronautical Knowledge FAA H 8083-25

Chapter 7 – Flight Manuals and Other Documents
www.faa.gov/library/manuals/aviation/pilot_handbook/media/faa-h-8083-25-2of4.pdf

Distress Signal

- Mayday! Mayday! Mayday! - Wikipedia http://en.wikipedia.org/wiki/Mayday_(distress_signal)

Emergency Frequency

- Wikipedia – http://en.wikipedia.org/wiki/Aircraft_emergency_frequency

Transponder Operation & Codes

- Wikipedia – http://en.wikipedia.org/wiki/Transponder_(aviation)

Engine Problems

If the engine quits, the problem is most likely fuel, air or spark.

- Fuel - Fuel problems are divided into two areas – fuel starvation and fuel exhaustion.

o Fuel starvation is when there is fuel in the tank, but no fuel flowing to the engine. Some causes include

- The position of the mixture control
- The position of the fuel selector valve or fuel shut off valve
- The mechanical fuel pump may not be working
- A fuel line may be plugged or broken

o Fuel exhaustion is no fuel remaining onboard the aircraft. The fuel tanks are empty.
You may be able to correct fuel starvation, but you will not correct fuel exhaustion. When you depart the airport, depart with full tanks. Visually check the tanks prior to departure and check you fuel status often enroute.

- Air - Air must pass through the carburetor for proper engine operation. Carburetor ice can block normal airflow and cause engine failure. Know and recognize the conditions for carb ice and use carb heat.
- Spark - The magneto switch(s) must be in the on or both position depending the type of mag switch(s).

Oil temperature, oil pressure, exhaust gas temperature (EGT) and cylinder head temperature (CHT), if available, should be monitored at engine start and during the entire flight. If any exceed the operating range specified by the engine manufacturer, corrections should be made immediately to bring them back into range. If it is not possible to maintain the proper engine operating conditions, a precautionary landing should be considered.

Fuel Management

A number of the Light Sport Aircraft (LSA) are equipped with a fuel selector valve that allows fuel to be drawn from the LEFT tank or the RIGHT tank individually. Some also include a BOTH position, draining from both tanks simultaneously.

The LEFT/RIGHT configuration requires that pilots keep the fuel load balanced by changing the selected tank on a regular interval. Some items for consideration:

- Use the BOTH position for take off and landing

- Use the boost pump for take off, landing and when switching tanks
- Do Not drain one tank dry before switching to the other tank
- Set a timer to help remember when to switch tanks
- Check the position of the fuel selector valve as part of the landing checklist (GUMPS – Gas, Undercarriage, mixture, prop, switches)

Aeromedical

Long cross country flying can bring on medical conditions that may not be experienced in shorter flights. Each has symptoms that can be recognized and corrected before a serious medical condition develops or damage to the aircraft caused by pilot error.

- Dehydration - Dehydration is the term given to a critical loss of water from the body. The first noticeable effect of dehydration is fatigue, which in turn makes top physical and mental performance difficult, if not impossible. As a pilot, flying for long periods in hot summer temperatures or at high altitudes increases the susceptibility of dehydration since the dry air at altitude tends to increase the rate of water loss from the body. If this fluid is not replaced, fatigue progresses to dizziness, weakness, nausea, tingling of hands and feet, abdominal cramps, and extreme thirst. Drink water early in the flight and often to prevent dehydration during long flights. Caffeinated beverages do not prevent dehydration and may add to the problem.
- Fatigue - Fatigue is frequently associated with pilot error. Some of the effects of fatigue include degradation of attention and concentration, impaired coordination, and decreased ability to communicate. These factors can seriously influence the ability to make effective decisions. Factors such as stress and prolonged performance of cognitive work can result in mental fatigue. Fatigue is the kind of tiredness people feel after a period of strenuous effort, excitement, or lack of sleep. Rest after exertion. Eight hours of sound sleep ordinarily cures this condition.
- Hypothermia -Hypothermia means that the body's inner core temperature has begun to descend significantly below the body's norm of 98.6°F. A drop of only 3° or 4° in body temperature could overload the heart, impair circulation, and lead to irreversible brain damage. Signs/symptoms of hypothermia may include gradual loss of mental and physical abilities. Dress properly for flying in open cockpit aircraft and winter flying in closed cockpit aircraft. Heaters in LSAs may not be enough keep the cold off.
- Carbon Monoxide - Early symptoms of CO poisoning are feelings of sluggishness, being too warm, and tightness across the forehead. The early symptoms may be followed by more intense feelings such as headache, throbbing or pressure in the temples and ringing in the ears. These in turn may be followed by severe headache, general weakness, dizziness, and gradual dimming of vision. Large accumulations of CO in the body result in loss of muscular power, vomiting, convulsions, and coma. Finally, there is a gradual weakening of the pulse, a slowing of the respiratory rate, and death.

Carbon Monoxide is the product of combustion may be the result of a faulty exhaust system. If you smell exhaust odors or begin to feel any of the symptoms previously mentioned, you should immediately assume carbon monoxide is present and should take the following precautions:

- o Immediately shut off the cabin air heater and close any other openings that might convey the engine compartment air to the cabin.
- o Open a fresh air source immediately
- o Avoid smoking
- o If you are flying, land at the first opportunity and ensure that any effects from CO are gone before further flight.
- o Determine that CO is not being allowed to enter the cabin because of a defective exhaust, unsealed opening between engine compartment and cabin, or any other factor

- Motion Sickness – Motion sickness, or airsickness, is caused by the brain receiving conflicting messages about the state of the body. Anxiety and stress, can contribute to motion sickness. Symptoms of motion sickness include general discomfort, nausea, dizziness, paleness, sweating, and vomiting.

If symptoms of motion sickness are experienced, opening fresh air vents, focusing on objects outside the airplane, and avoiding unnecessary head movements may help alleviate some of the discomfort. Although medications like Dramamine can prevent airsickness in passengers, they are not recommended while flying since they can cause drowsiness and other problems.

Aeromedical Factors

- Pilot's Handbook of Aeronautical Knowledge FAA H 8083-25

Chapter 15 – Aeromedical Factors
www.faa.gov/library/manuals/aviation/pilot_handbook/media/faa-h-8083-25-4of4.pdf

- FAA Advisory Circular AC20-32 - Carbon Monoxide
http://rgl.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/63a24427d0d8141f862573830061c88d/8251f23c84b19246862569ad00777359/$FILE/AC20-32b.pdf

Global Positioning Systems - GPS

The use of a GPS for navigation can reduce the cross country workload. Course & track depiction, distance & time to the destination and moving map are a few of the functions offered. The GPS can be a great asset but do not become so dependent

on it that you are lost without it. Batteries can go bad, the signal can be lost and the operation of can be a challenge to pilots who have not read the manual. The estimates for time enroute (ETE), time of arrival (ETA) and other calculations are based on data at the time of the observation. – a snapshot. As conditions change, the estimates will change. The GPS numbers should be used in conjunction with your calculations. Pilotage (navigation) and the sectional chart are the basic tools. The GPS should be used to supplement them, not replace them.

GPS

- Pilot's Handbook of Aeronautical Knowledge FAA H 8083-25

Chapter 14 – Navigation – www.faa.gov/library/manuals/aviation/pilot_handbook/media/faa-h-8083-25-4of4.pdf

Pilot in Command

"The pilot in command of an aircraft is directly responsible for, and is the final authority as to, the operation of that aircraft." 14CFR91.3

The safety of your passengers and the aircraft is your responsibility. You are expected to know the regulations and adhere to them. However, if following a regulation places the aircraft in an unsafe situation, you, as PIC, may deviate from the regulation. You know your situation and what action must be taken to correct an unsafe condition. You may be asked to explain your decision to deviate from the regulations, but a well thought out and executed decision to deviate for safety reasons may be all the explanation that is necessary.

PIC – Responsibility & Authority

- 14CFR91.3 – Responsibility and Authority of the Pilot in Command – http://www.flightsimaviation.com/data/FARS/part_91-3.html
- 14CFR91. 3 – Responsibility and Authority of the Pilot in Command – http://www.airweb.faa.gov/REGULATORY_AND_GUIDANCE_LIBRARY/RGFAR.NSF/0/E63BBEDC3044A110852566CF00612076?OpenDocument

PIC – Preflight

- 14CFR91.103 – Preflight Action – http://www.flightsimaviation.com/data/FARS/part_91-103.html
- 14CFR91.103 – Preflight Action – http://www.airweb.faa.gov/REGULATORY_AND_GUIDANCE_LIBRARY/RGFAR.NSF/0/8FF69D2EEBA22CF9852566CF00613B69?OpenDocument

PIC - Safety Belts & Shoulder Harnesses

- 14CFR91.107 - Use of safety belts, shoulder harnesses, and child restraint systems – http://www.flightsimaviation.com/data/FARS/part_91-107.html
- 14CFR91.107 - Use of safety belts, shoulder harnesses, and child restraint systems – http://www.airweb.faa.gov/REGULATORY_AND_GUIDANCE_LIBRARY/RGFAR.NSF/0/00802FA7C076996F862571AB0050301D?OpenDocument

PIC - Compliance with ATC Clearances and Instructions

- 14CFR91.123 Compliance with ATC clearances and instructions – http://www.flightsimaviation.com/data/FARS/part_91-123.html
- 14CFR91.123 Compliance with ATC clearances and instructions – http://www.airweb.faa.gov/REGULATORY_AND_GUIDANCE_LIBRARY/RGFAR.NSF/0/7EC350FA6F2921DB852566CF00615B7E?OpenDocument

Regulations

All of Title14 Code of Federal Regulations (14CFR) can be found at

- 14CFR – All parts http://www.flightsimaviation.com/data/FARS/
- 14CFR – All parts – http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgFAR.nsf/MainFrame?OpenFrameSet

Next Phase

The Arrival phase will be covered next. This includes the time between the last checkpoint and the tie down. Until then, you can listen to these and other aviation topics at

- SweeneyCorp, Audio Presentations www.sweeneycorp.com/audio%20presentations.htm

Links referenced in the article can be found at

- SweeneyCorp, Magazine Articles http://sweeneycorp.com/ultraflight_magazin.htm

Editors Note: To view and access links contained in this article go to www.ultraflight.com click on Sweeney Corp Link on right side of home page. Then go to Ultraflight Magazine Articles and choose the article and you will see the live links for your viewing.