

APPI PPG

LECTURE 8: FLIGHT PLANNING AND NAVIGATION (UK)



Introduction

The following lecture focuses on the skills required to successfully and safely complete a cross-country flight. It does not cover advanced navigation skills for larger cross-country flights. It is very important that you take down and understand the following information in order to maximise your flying and improve your safety.

Pre Flight

Equipment

- Always fully charge all of your batteries on your GPS, Variometer, Electric Start Paramotors, Radios, Mobile phones etc. There is nothing more annoying than having your batteries run out during the flight.
- Make sure you have the correct clothing for the flight including your flying suit, ankle supporting boots, gloves, helmet, sunglasses etc. It can get very cold up there so bring the correct clothing.
- Mix your fuel the day before and if in doubt always add a little bit more oil in order to avoid a seizure. It is a good idea to carry 100ml of two stroke oil which can be used in the event of having to land next to a petrol station!
- It is recommended that you carry out a full check on the equipment the day before you fly in order to ascertain any problems and fix them. On the day itself you should still carry out a pre solo flight.
- Always take the tools required to service and check the equipment as well as spare parts, particularly spark plugs. Allen keys and spark plug spanners are light and can be carried during the flight.
- Always fly with a watch to help work out how long you can fly for. In order to work the fuel burn rate you need to complete a limited fuel task and work out how long it takes to burn a litre during a standard flight. If it takes 15 minutes to burn 1 litre then the engine consumes 4 litres an hour. With a 10 litre fuel tank the max flight time should be 2 hours, leaving room for error.
- Always fly with a compass. The compass can be used to orientate yourself if you lose your bearings or your GPS fails!
- Always fly with a mobile phone. In the event of an incident the mobile phone could save your life or someone else's!

Route Planning

- Always plan the route you intend to fly the day before. The best way to do this is to create a route plan. This could be a simple out and return flight using a line feature, such as a road, to navigate. You could then reach a specific location, such as a roundabout or road junction, before turning around and following the road back.
- If making a more advanced flight plan there is the option to plot this using a GPS however this could fail. Remember to keep it simple at first and not try to fly to too far too soon.
- Remember to always fly on the right hand side of the line feature and make sure there are at least 3 emergency landing options available. During the flight remain 500ft from any person, vessel, structure or object and stay at least 1500ft from any built up areas.
- Having made a basic flight plan, check on an air map to ensure it is legal. Then contact NOTAMS to ensure there is no temporary restricted airspace, as well as informing them of your flight plan at least 8 hours in advance. For information about Temporary Restricted Airspace, namely for Royal Flights and the Red Arrows, call 0500 354 802 and for Military Mid Week flying call 0800 515 544. You should also visit the Aeronautical Information Service website: www.ais.org.uk
- Legally every pilot must fly with an up to date air map in order to avoid infringing upon restricted airspace. This is difficult to do with a Paramotor and therefore recommended that you photocopy a specific section of the 1:250,000 air map in order to take with you during the flight.

Other Pre Flight Checks

- Always ensure that you have permission from the landowner to fly and always survey the site for danger areas, emergency landing areas etc.
- Keep an eye on the weather forecast but be aware that this could change or not be accurate.
- It may be a good idea to take some food and drink with you if you plan to complete a long cross country flight.
- Make sure you visit the loo prior to going on a long flight! Even though it is legal to drop liquids from a Paramotor; it may not be the most practical or pleasant thing to do!
- Always remember to tether your radio, GPS, Variometer etc prior to flight.

In Flight

General Information

- During the flight you should fly at least 500ft above the ground at all times; preferably a little higher and at least 1500ft above built up areas. This will allow you have a good view of the surrounding area and enable you to see your way points and line features.
- Be aware that areas you are familiar with look very different from above and it is therefore very easy to loose your bearings. This is one of the reasons we should always fly with a compass. The other reason is that electronic equipment can run out of batteries and break down at any time! The compass is therefore your back up.
- If you do get lost try to regain you bearings by orientating yourself using the compass or in relation to the sun. If in doubt head back to your last known line feature or way point.
- When following a line feature always keep it on your left in accordance to international air law.
- If you have planned the flight properly your cross country flight should simply be a case of following the route plan and referencing the map in order to ensure you are on course.
- Remember that every plan goes to the cleaners on first contact; therefore always be prepared to land in the event of the weather changing rapidly, an engine failure or running out of fuel etc. It is therefore very important that you keep an eye out for emergency landing areas throughout your flight.
- If flying with others make sure you fly at different altitudes and maintain a good separation while constantly looking out for the other pilots. Never fly directly behind, above or below another pilot.

Fuel Management

- It is obviously very important that you have a good understanding of how much fuel you have. It is possible to buy certain devices which can tell you how much fuel you have burned and therefore how much you have left.
- One way of keeping an eye on the fuel is to use a small mirror. However, the most accurate way is to work out how long it takes to burn 1 litre of fuel during a standard flight.
- When you know roughly how many litres you burn an hour it becomes a lot easier and safer to plan your cross country flights. You can then monitor your flight time with a watch knowing roughly how much longer you can remain airborne.
- Yet again always allow 20 minutes grace because the motor can burn more fuel due to varying conditions, throttle settings etc.

Cross Wind Drift

- A Paramotor is similar to a boat; when a boat attempts to go across the current it can drift down stream. The same thing happens to a Paramotor.
- We must therefore track across the wind line by pointing the wing 45 degrees to the wind line, thus compensating for the drift. This is also known as crabbing and a very good way of making sure we stick to our flight plan and maintain the correct heading towards our intended way point.
- To make sure you are not drifting, keep an eye on your next way point so you can make any adjustments to stay on course. A compass can also help keep you on a true course but a GPS will give you the most accurate feedback.

Further Information

- When using gloves make sure you can still operate the controls correctly as well as the buttons on your instruments.
- Height equals safety because we have time to think and but with height comes increased wind speed!
- In the event of an engine failure at altitude you should not panic! Firstly, try to restart the Paramotor a few times while monitoring your height. If there is no success you should look for a safe landing area.
- The wind direction can be found in a series of ways; if you have height you can perform four 90 degree turns and judge your speed over the ground to work out the rough wind direction.
- Other ways of discovering the wind direction are to look for any smoke or see which way the birds are landing/taking off.
- Having finalised the rough wind direction set up at the back of the landing area doing figure of '8's and 'S' turns before committing to the final glide.
- You should be prepared so get out of the seat and be ready to run on landing. Be sure to put in a big flare on landing.
- When flying always keep a look out for wires, pylons and other obstructions.
- When flying with other pilots always keep a good look out to ensure you know where they all of the time. Remember Air Law: On the right in the right!
- When turning always look before you turn to ensure the airspace is clear. This also tells the other pilots that you are about to turn.
- In the event of another pilot going down, first assess whether they are conscious or not. If they are ok then it may be possible for you to guide in the retrieval crew from the air. If not, assess the landing area first to ensure it is safe to land without endangering the person on the ground or yourself.
- Remember, this sport is as safe as you are. Do not endanger yourself or others around you. Stick to Air Law and make safe, calculated and informed decisions. Always fly with a reserve and if you are ever in doubt do not fly!

ANY QUESTIONS?

END OF LECTURE 8