LESSON 6
EMERGENCY PROCEDURES

Aim: To provide the knowledge to enable the pilot to deal with emergency situations in the Aerochute

EMERGENCY HANDLING

Emergencies in the Aerochute are a rare occurrence. If an abnormal situation develops it is important to deal with the situation in a methodical manner and prioritize your actions. The following is a suggested sequence of events when dealing with any emergency.

1. FLY THE AIRCRAFT

Don't let an unusual situation distract you from you primary task of continuing to fly the Aerochute safely. This means fly at a safe height and in a safe direction. There have been many accidents attributed to the pilot being distracted by a problem and flying his aircraft into the ground!

2. ANALYZE THE PROBLEM

Take the time to analyze exactly what the problem is.

3. CARRY OUT ANY ESSENTIAL ACTIONS

Carry out any actions that may minimize or correct the situation.

4. LAND THE AIRCRAFT

Make a plan to land the aircraft in a safe area with minimum risk to yourself and others.

ENGINE EMERGENCIES

The Rotax engine has developed a reputation of reliability and engine failures due to a mechanical fault are very rare.

Most problems with the engine can be avoided by ensuring that:

1. Thorough pre-flight inspections are conducted.
2. Engine maintenance according to the manufacturers recommendations is carried out.
3. Correct handling and storage of fuel and oil is observed.

Note: Make it a practice to store the Aerochute with a near full tank of fuel, especially in cold months of the year. This will minimize the chance of water condensing out of the air in the fuel tank.

What can cause engine failure? Some of the possibilities are:

- Running out of fuel.
- Fuel starvation.
- Wrong fuel/oil mixture.
- Faulty, old or incorrect type of spark plugs.
- Ignition problems (wiring/wear and tear).
- Engine seizure.

Note that an engine failure may not be a complete loss of power

ENGINE EMERGENCIES

Since no activity is without risk, in aviation we aim to minimize the level of risk to as low as possible.

How can we minimize the risk involved with an engine failure?

Always fly the Aerochute assuming that the engine can fail at any time. This means:

1. Use the full length of the take-off field. This ensures there is the maximum amount of field ahead of the aircraft if the take-off needs to be aborted.

2. Plan your path after take-off over the lowest terrain. This will ensure that, if the climb rate after take-off is marginal, obstacles are avoided.

3. On a cross country trip fly over open country or within gliding range of a suitable landing area.

4. Only low fly over a suitable landing area and if there is any significant wind, low fly into wind.

5. When landing, plan your approach path to the field over suitable terrain.

ENGINE EMERGENCIES

Remember:

1. Due to its design the Aerochute is very forgiving in an engine failure situation.
2. Without the engine operating we can land the Aerochute using the parachute.
3. The Aerochute glide distance is approximately 4 times its height.

ENGINE FAILURE ON TAKE-OFF

Preparation: Use the entire length of the field and takeoff into the wind.

Actions:

- If possible, turn the Aerochute into the wind.
- Full flare approximately 15-20 feet above the ground to arrest the rate of descent.

Note: Due to the attitude overswing, immediately after the engine failure the Aerochute will have a high rate of descent until the glide is stabilized.

ENGINE EMERGENCIES

ENGINE FAILURE IN THE CIRCUIT

Preparation: Plan the circuit direction over the most suitable terrain and fly the circuit at suitable heights in preparation for an engine failure.

Actions:

- Turn towards a suitable landing area (a 180° turn will loose about 200 feet).
- Land into the wind if possible.
- Avoid turning close to the ground.
- Full flare approximately 15-20 feet above the ground to arrest the rate of descent.

Note: If landing with a strong tailwind component the parachute may pull the cart over forwards after landing.

ENGINE EMERGENCIES

ENGINE FAILURE ON A CROSS COUNTRY

Preparation: Always fly over open country or within gliding range of a safe landing area. Fly at a suitable height to give as many options to glide to as possible (1,000 feet AGL). Always be aware of the wind direction.

Actions:

- If height permits, turn into the wind and look for a suitable landing area.
- If you are low, turn immediately to the nearest achievable landing area.
- If high and you have a landing area identified, position the Aerochute on the downwind side of the field and manoeuver the aircraft to lose height to land in the first 1/3 of the field.
- Avoid turning at low level.
- Full flare approximately 15-20 feet above the ground to arrest the rate of descent.

Note: If landing with a strong tailwind the parachute may pull the cart over forwards after landing.

ENGINE EMERGENCIES

PRECAUTIONARY SEARCH AND LANDING

A precautionary search and landing pattern is practiced so that in the event of you needing to land at an unplanned field, it can be done with minimal injury or damage.

What are some of the reasons that may cause you to make a precautionary search and landing?

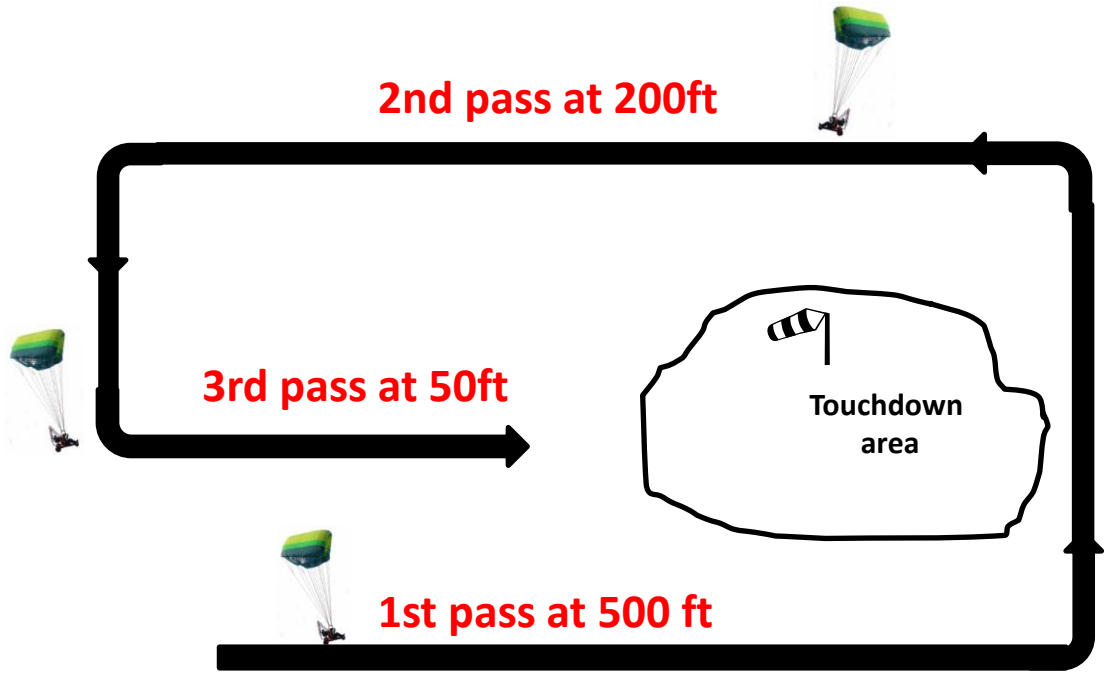
- Running low on fuel.
- Engine troubles.
- Approaching sunset.
- Bad weather.

Note: If a problem arises you need to make a decision to land ASAP or continue to your planned landing area. It is better to select a suitable landing area early and land safely than to be forced into a rushed landing, possibly without power.

PRECAUTIONARY SEARCH AND LANDING

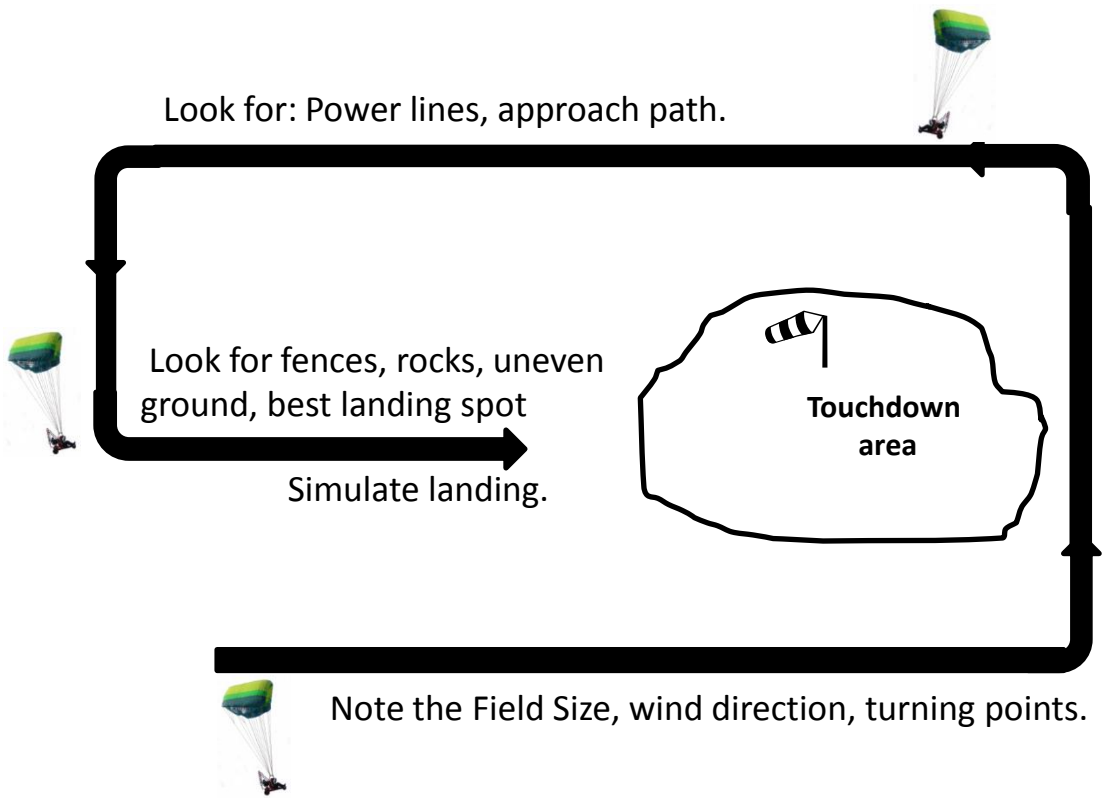
The pattern is flown by selecting a suitable landing area and flying 3 passes with the final pass into wind. Note that the passes should be wide enough to give the pilot time to asses the touchdown area for suitability and plan his circuit so he is not rushed.

The first pass is flown at 500ft AGL, the second at 200ft AGL and the final pass in the landing direction is at 50ft AGL.



AIRMANSHIP: Orientate the passes so you land into the wind

PRECAUTIONARY SEARCH AND LANDING



During the 3 passes you are assessing the field for suitability as shown on the diagram.

Remember that small things such as power lines, rocks in the field, bull holes etc. may not be visible until low on the last pass.

When assessing the field use the 7 "S" rule too remind you what to look for:

Size
Shape
Slope
Surface
S.W.E.R (Single wire earth return power lines)
Sun
Stock

During the 3rd pass if the field looks suitable, land ahead. Otherwise go-around and fly a circuit to land. In addition to the pre-landing checks (check harness tight) it may also be necessary to complete the following:

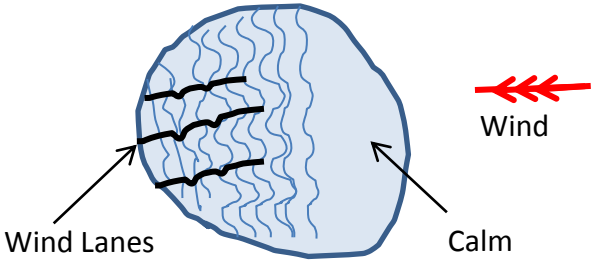
- Passenger brief.
- Radio call if fitted.

Remember: Don't panic, it's the pilots decision to land. If the field is no good then find another field.

WIND ASSESSMENT

When conducting a precautionary search at a field different to the one you took of from you will most likely not have the use of a wind sock to assess the landing direction. Also, when conducting a cross country flight it is good airmanship to constantly asses the direction of the wind so you may be better prepared to make a quick landing into the wind should you need to do so. The following are some methods of assessing the surface wind.

Dams/Lakes/Rivers



The upwind side of a body of water will usually have calm water before the ripples form. In addition, if the wind is strong enough “wind lanes” may form from froth which show the direction of the wind.

Other wind indicators are:

- Trees.
- Crops in fields.
- Smoke from fires.
- Dust blown up from paddocks.
- Cloud shadows. The movement of the shadows give a rough indication of the wind direction however, the clouds need to be close to the ground to ensure they are effected by the same wind.

Note: The direction windmills face is not always a reliable indicator as they may be “locked” and not be pointing into the prevailing wind.

CANOPY EMERGENCIES

CANOPY STALL

Under normal circumstances canopy stall is not possible due to the configuration of the canopy and the anti-stall rings

Q. What causes the stall?
A. Angle of attack is too great.

If the stall happens then 2 things can occur:

1. Dynamic Stall where the parachute remains open but there is a loss of lift and the canopy oscillates left and right.
2. Full Stall where the canopy may collapse.

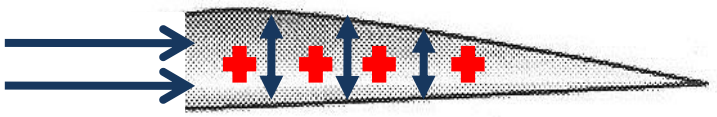
The recovery actions are aimed at reducing the angle of attack and restoring airflow. Recovery Actions:

1. Reduce power to reduce the angle of attack.
2. Move your weight forward as much as possible.
3. Reach up and attempt to pull the leading edge lines down.
4. If a full stall - pump the toggles to attempt to regain airflow into the front of the cells to re-inflate them.

CANOPY EMERGENCIES

CANOPY COLLAPSE

The canopy is being inflated due to the forward motion of the air and the higher pressure inside the canopy. Flying in severe turbulence may disturb this airflow but generally not to the extent of canopy collapse.



Airmanship: You shouldn't be flying in conditions of severe turbulence.

The most likely time you will see canopy collapse is when the canopy is opening on take-off. This can be caused by stray air currents or use of the wrong toggle.

Recovery actions if the canopy collapses when opening on take-off:

1. Pump the steering line on the collapsed side.
2. Apply opposite flap to the collapsed side.

Recovery actions if the canopy collapses airborne:

1. Keep power constant.
2. Apply flare to the opposite side of the collapse.
3. Pump the steering lines on the collapsed side.
4. Try to turn downwind then into wind to inflate the cells.

CANOPY EMERGENCIES

CANOPY CELL BLOW-OUT

If the air inside the cell is allowed to escape then the cell cannot maintain its aerodynamic shape

It is highly unlikely it will happen due to the strength of the canopy. Risk of a blow out can be minimized by:

- Thorough pre-flight inspections.
- Have the canopy inspected every 50hrs.
- Try to avoid landing in fields with ground cover or obstacles that may tear your chute.

Recovery actions if a cell blows-out:

1. Try to keep into wind.
2. Pick a safe landing area.
3. Control the descent with power.
4. On landing flare and use power to arrest the possible higher sink rate.

CANOPY EMERGENCIES

STEERING LINE BREAKAGE

It is highly unlikely it will happen due to the strength of the lines.
Watch for wear on the steering lines, especially through the eyelets.

In the event of a breakage at the ring stop the lines will trail far behind the parachute.

On the side of the unbroken line, turning can still be achieved by using the toggle.

On the side that the steering line is broken a turn can be achieved by gently pulling down on the **rear outside trailing edge** line.

Note: Only a gentle pull is required.

Flare is not available for landing so a shallow, powered approach is used.

Recovery actions if a steering line breaks:

1. Use power to maintain height.
2. Assess the situation by looking at the chute and lines to ensure the propeller will not be fouled by the lines.
3. Use the outside trailing edge line and opposite toggle to steer.
4. Land using power only to cushion the landing.

Revision

1. What is the first priority if you encounter a problem airborne in the Aerochute?
2. For the take-off, what actions can we take to minimize the risk of an engine failure?
3. For the landing, what actions can we take to minimize the risk of engine failure?
4. On a cross country flight, what actions can we take to minimize the risk of engine failure?
5. You are at 300ft AGL downwind in the circuit when you experience and engine failure. List your actions.
6. What is the primary cause of a canopy stall?
7. What actions can we take to unstall a canopy?
8. What are your actions if you look up at the canopy airborne airborne and notice that the trailing edge of one of the cells has “blown out”?
9. How can we steer the Aerochute if the left hand steering line breaks?
10. How can we land the Aerochute with a broken steering line?