# UNDERSTANDING A GOOD LANDING PROFILE

One of the fundamentals of safe canopy flight is allowing the canopy to fly, prior to any input for landing (i.e. the flare). A technique used by many flight schools is to count anywhere between 5 and 10 seconds of full flight (to allow the canopy to recover) before putting any input into the flare.

The Landing Profile Diagrams:
Diagram A shows a smooth glide path - the ideal approach to maintain efficiency and speed throughout the landing approach. At the same time this glide path offers the safest approach angle and if adopted will ensure you never put yourself in the danger zone. In this case the pilot reaches his point of final input and allows the canopy to fly on full drive for between 5 and 10 seconds. This allows the canopy to recover and return to an efficient state before any landing input is made. As soon as the pilot makes any landing input the canopy is losing some of its efficiency so the more the pilot allows the canopy to fly the better the speed, the flare and ultimately the softer the landing. If you watch an aircraft coming into land they have a nice smooth descent with a slow deceleration and flare for an efficient landing. An aircraft does not dive towards the ground and then immediately induce a flare. Underneath a canopy we are looking for the same profile.

Diagram B shows a very inefficient and perhaps misleadingly, a spectacular descent profile. In this case the pilot reaches the final point of input too close to the ground to allow the parachute to recover to an efficient wing before there is input for the landing flare. This is a great indication that the pilot is too low. This leads to loss of speed, a poorer range of flare and ultimately further into the danger zone.

Student versus Experienced, Swooper versus Non Swooper.
The landing profile in diagram A can be adopted regardless of whether you are experienced, just off student status, a swooper or if you never want to swoop in your skydiving career. It is also irrelevant as to which canopy you fly – a fast performance canopy or a slow docile one. What this landing profile gives you is an efficient wing at the time when you need it most – when you are coming in to land.

“I want to go faster”
The difference between someone doing a straight in approach and a pilot doing a high performance landing is what they do to the canopy before the point of final input. A good pilot will build up the speed by performing a manoeuvre above the point of final input and will allow that speed to be carried for as long as possible without interruption. A good pilot knows how high the final point of input is above the ground for his type of canopy, at that dropzone, in those weather conditions, after that particular input, for his weight. If you do not know this information about your canopy then you should question as to whether you should be attempting high performance landings.

A pilot approaching as with the landing profile shown in diagram B will never achieve safe, efficient, long landings. This profile is incredibly inefficient especially if the pilot is trying to build up speed. All the speed built up in the turn is immediately removed as the

canopy decelerates to transfer forward speed into lift to ensure the canopy recovers in time. It is due to this transfer of forward speed to lift each time that the pilot who has this descent profile will never get any further distance with a landing until a different technique is adopted.

Take the Test

Go out onto your dropzone and watch someone land. Make a note of the last point at which they have put input into their canopy. This could be due to a turn or adjustments on a straight in approach. A good technique is to watch the shape of the wing rather than the pilots movements – this often tells more of a story. Start counting, one thousand, two thousand…until the pilot puts input into their canopy to start the landing flare. If there is input before you reach five, the pilot is flying their approach as in diagram B, not allowing the canopy to recover and will be too low – not necessarily dangerously low but too low.

What is Too Low?

Dangerously low is where the pilot has to make sudden inputs to save himself from injury. Too low is not necessarily dangerously low. Too low means that the pilot is using input to fly the canopy out of the natural recovery. Too low is also when the pilot is not allowing the canopy to give him optimum landing performance or flare.

If you imagine your full flare range as having a value of 100% - If you do not allow for a good landing sequence i.e. the recovery time of 5-10 seconds your are entering your landing flare with a reduced flare range. It now maybe only 80%, 60% or in the worst cases maybe only 30% or 20%. Now if you find yourself dangerously low and need to save yourself how much flare range would you prefer?

As the canopy pilot becomes more proficient the definition of too low becomes much more subtle. In competition, if I have to make adjustments during the recovery and flare sequence it means that I am reducing my speed and distance and ultimately I become less competitive. I may be well within my safety margins but I am not getting the optimum efficiency through my landing approach. I can become more competitive by turning higher so no small adjustments are needed. Top pilots have the ability to build up a great deal of speed up high and maintain that speed through the landing approach for as long as possible.

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Even if you are never going to attempt a high performance landing be aware that you will at some point find yourself dangerously low to the ground and you must have the survival skills for this situation (get yourself on a canopy course!). However regardless of your experience if you re-learn your landing approach and work towards the landing profile show in diagram A you will hopefully limit the number of times this might occur. In addition to the benefit of this added safety margin, you will find your canopy's performance will increase, your flare range will increase and ultimately the distance you can cover in a high performance landing will increase.

Whatever your approach to landing safely these diagrams should help you recognise the difference between a safe and efficient landing sequence and a potentially dangerous, inefficient one.

Case Study:
A jumper with 270 jumps joined a canopy course complaining that she was getting no flare from her canopy and landing hard. The mid to high performance canopy was fairly new and she was loading the 160 square foot canopy lightly. After vid eoing her landings a couple of times it was apparent her problem lay in two areas, Firstly her timing and technique of the flare - she had a habit or waiting too long before starting the flare and once she flared it was too aggressive and quick as though s he was flying slow docile canopy. Secondly (probably due to her expectation of a hard landing), on her final approach she had constant input using her toggles to slow the canopy down, right up to the point of flare. The shape of her canopy was therefore ne ver allowed to be efficient and therefore she had lost a great deal of her usable flare range.

She then made a couple of jumps adjusting her flare technique and using the approach sequence in diagram A by counting between 5 and 10 seconds of full flight before her flare. Her landings were immediately transformed into softer, and more controlled landings.

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