



# Paragliding

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## About the Tutorial

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Paragliding is an extreme sport that requires daring and a strong heart to play. A player has to fly above a huge height from the ground and needs to show his/her skill.

Though the content of this tutorial is not broad enough to cover all the aspects of paragliding, it has sufficient details to supplement an unknown user with necessary details.

## Audience

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This tutorial is meant for anyone who wants to know about paragliding. It is prepared keeping in mind that the reader is unaware about the basics of the sport. It is a basic guide to help a beginner understand paragliding.

## Prerequisites

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Before proceeding with this tutorial, you are required to have a passion for paragliding and an eagerness to acquire knowledge on the same.

## Copyright & Disclaimer

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# 1. Paragliding – Overview

Paragliding is a sport in which the players fly in the air using paragliders. These paragliders are light in weight and are foot launched. There is a harness in the glider on which the paraglider sits. This harness is interconnected to the glider with baffled cells. We will learn various aspects of this adventurous in the chapters that follow.

To compete in this sport, the player must have adequate license for paragliding and all other related documents present with him before the competition. The distance covered by the player is transformed into points through computer in IGC format.



## A Brief History of Paragliding

The passion of paragliding was started by **Garvit Sharma**, who designed advanced gliding parachutes. Later in 1961, it was modified technically and soon the phase of para commander started. In the same line, **sail wing** was modified by **David Barish** which was used for recovering NASA space capsules. After 1980's, equipment started to modernise and this sport got a new dimension.

World's first paragliding championship (unofficial) was organised at Switzerland in the year 1987. Soon after that Federation of Aeronautic International (FAI) sport gave official nod to paragliding and organised first official world championship in Kossen, Austria in 1989.

## Participating Countries

PMA (Paraglider manufacturer association) published an interesting fact according to which currently there are 1, 27,000 paragliders all over the world. The sport has its huge fan following in Europe, followed by Asia and Latin America.

The countries that participate in this sport include Japan, Germany, Australia, France, New Zealand, Switzerland, South Korea, Brazil, China, Mexico, Taiwan, USA, India, Canada, Indonesia, Russia, Malaysia, and South Africa.

## **Paragliding – Environment**

Paragliding demands jumping from high heels and to ski in the air for long hours. Therefore, a hill station having a stiff peak and a wide area for surfing in the air will be a suitable environment. If it will be played in any normal crowded area, then it is obvious that the user will face difficulty while paragliding.



The area must also be free from any airline path so that the player should not face any emergency landing system due to an airplane approach. Adequate safety and protection must be taken care of before flying so that player can fly comfortably for long hours.



## 2. Paragliding – Equipment

In this chapter, we will discuss about the equipment used in paragliding.

### Wing

The wing or canopy of the paraglide is also known as **ram air airfoil** in aeronautical engineering. There are two sets of fabric on a canopy and it is connected in such a way that it forms an internal support material by forming row cells. The wings are made either of rip ton polyester or of nylon fabric.

### Harness

Harness is attached to the wing through baffled cells. The pilot use the harness to stand or sit and cover long distances. Nowadays harness also work as a backpack so pilots do not have to carry one. Airbag protectors or foam is below the seat which provides protection during failed launch or landing.



### Variometer

The variometer helps a pilot to gain height and also to get the location of rising air when he is sinking. As pilots cannot detect the rising and sinking air, variometers can do the job through short audio signals like beep. It also displays the altitudes.

## **Radio**

Radio is needed to communicate with other pilots and other assistants to paragliding. Different countries have different range of frequencies based on their system. In certain situation the pilots talk with the airport control and air traffic controller.

## **GPS**

The GPS or Global Positioning System is a must in paragliding as it helps the pilot to check for the area geographically and also other pilots track the movement of each other which helps them to track each other and learn each other movements.

### 3. Paragliding – Launching

In paragliding launching and the landing is done with the wind. The wind is used as an airstream by running, being pulled or with the help of existing wind. The pilots are moved in a place from where they can be lifted.

There are three different launching techniques: Forward Launch, Reverse Launch, and Towed Launch.

#### **Forward launch**

In this type of launch, the pilot has to run forward with the wings hanging behind. This process inflates the wing due to air pressure.



It is the easiest method of launch as in this case the pilot will only have to run forward and doesn't have to look backward. He can only notice the wing when it will launch upon his head.

#### **Reverse launch**

In this method the pilot runs facing the wing and bring it into the position of flying. The pilot then turns around to launch the glider. In reverse flying the pilot can inspect the condition and position of the wing. This method also helps the pilot to resist the force of wind during running.





### Towed launch

In this method, the pilot gets towed while launching. The pilot will be towed and when reaching the optimum mark, the pilot will be released. But this type of launch need separate training.



## 4. Paragliding – Landing

Landing in paragliding requires special techniques and patterns of traffic.

### Traffic pattern

In comparison to launch, landing needs coordination among pilots and they have to land in a group.



All the pilots land at the same time, as it is very important in the pattern. They have to follow the light path in a pattern of rectangle till the landing zone. This requires sync between the pilots as it is very important for a pilot to know what will be the next move of his fellow pilot.

### Techniques

The technique of landing comprises of approaching the wind and at the point before touching down, the wing is flared to minimize the speed from both axes. Before arriving on ground, the brake is shifted from 0% to 100% before touching the ground.

When the wind is light then landing can be done by running mildly. In faster wind landing is done without the forward speed and sometimes the pilot has to go backward.

Two methods of landing are flapping the wing to lose the performance and descend faster by using alternate braking. It is a professional technique so should be used only by experienced paraglider. Second method is collapsing the wing at the moment of touchdown.

## 5. Paragliding – Control

### Brakes

The pilot holds the brakes in his hand and it is connected to the edge of the trail on the both sides of the wing. They provide the control in paragliding as controlling is the most important part when it comes to aerodynamics. These brakes are used to adjust the speed, shifting weight, and also helps in flare during the landing.



### Weight Shift

Apart from manipulation of the brakes, the pilot has to lean to steer the paraglide properly. Such shifting of weights helps in eliminating various moves when brakes cannot be used, which eventually helps in limiting the steering. Weight shifting is also helpful during controlling all advance techniques.



## Speed Bar

Speed bar is the word as similar to accelerator. It is a type of foot controller attached to the harness through which a pilot takes the paraglider to a new speed. It decreases the angle of attack of the wing which gives the paraglider a boost of speed. One can't apply brakes as it will slow down the wing.

Some of the advanced move is to manipulate the risers of the paragliders. By using the BIG EAR technique, which involves the rate of the descent can be increased by folding under the wingtips by inducing the wing's leading edge with the line connecting on the outermost of the par gliders.





## 6. Paragliding – Fast Descents

Fast descents are the condition of getting down during unexpected change of weather or when the situation of lift is very good. There are three types of fast descent methods.

### **Big ears**

In this technique the out A-lines are pulled out when there is no acceleration, the flight will fold the wing in an inward manner which will then reduce the angle of glide while mildly decreasing the forward speed.



As the wing area gets reduced, the loading of wind increases and then the wing becomes more stable. But this method will increase the angle of attack and the craft will go into a stall speed and it will then increase the descent rate but that can be rectified by applying the speed bar which will help the descent rate to increase and the wing will re-inflate.

### **B-line stall**

In this method, the riser of the second set is pulled out from the leading edge or the front of the B-lines independently from the others. It puts a crease in the wing and then it separates the airflow from the surface of upper part of the wing. It reduces the lift which were being produced from the canopy and increases the rate of descent.



### Spiral dive

This is the most fast and effective method of fast descent. It can give up to a sink rate of 25m/s. This method holds all forward progress and left the craft to air down and then the pilot pulls the brakes and shifts his weight on one side and then take a sharp turn. After few turns the wing reaches pointing directly towards ground. When the driver reaches his desired height, he then slowly pulls the brakes and shifts his height towards outside.





## 7. Paragliding – Flying Types

In this chapter, we will discuss about the types of flying in paragliding.

### Soaring

This kind of flight is done with the help of wind which is directed upward with the help of a fixed object like **ridge** or **dune**. In this kind of slope soaring, the pilot flies by help of air lift. The pilot flies along with the slope and the lift is being provided by the air. Slope soaring totally depends upon the steady wind along with the speed of the wind and the skill of the pilot.



### Cross-country flying

Cross-country flying is moving from one thermal to the next available thermal. A pilot has to recognize the thermal by the land features and also by identifying a cumulus cloud where humid air reaches and cumulates to a cloud.



Cross-country flying needs extreme knowledge of air law, flying regulation, and aviation maps which show any restricted airspace etc.

## Thermal Flying

The ground and the surrounds becomes hot due to sunlight. These surroundings include buildings, rocks, and many others. Due to this, the thermals are set up which rise with air. While rising, these thermals are detached from their source and form a new thermal. These thermals help a paraglider to fly in circle and tries to reach the center of the circle as the speed of wind is faster at the center. This speed helps a paraglider to rise.



Thermal flying is a technique which needs precision, persistence and time to learn. A good pilot can fly with the core up through the cloud.

## 8. Paragliding – Championships

Federation of Aeronautic International (FAI) is the governing body who conducts fair play of this sport all over the world. In the same way, all participating nations have their own governing body too those who organise championships within their nation.



Some of the major championships of paragliding are:

- FAI World Paragliding Championship
- European Paragliding Accuracy Championship
- British Paragliding Competition
- Australian Paragliding Championships
- Swiss Paragliding Championship

Players such as Frank Brown from Brazil, Nevil Hulett from South Africa, Aijas Valic from Slovenia, hold world records in paragliding. Peggy McAlpine is the oldest paraglider who glided from 2400 ft. at the age of 104.