

# Guidelines for mountain flying at Skydive Voss

## Abbreviations

### HFL – Ground Control

Responsibilities – Communication with plane and manifest. Make sure all jumpers are accounted for.

### HL – Jump leader

Responsibilities – Make sure the jump operation is according to rules and regulations. Highest authority when CCI not present.

### HI – Chief Instructor

### HM – Jump master

Responsibilities – Jumpers in the plane, from boarding to landing. Planning and organizing the load.

**Innhopp** – A jump where the plan is to land off the DZ

Mountain flying is dangerous. Last year's incidents show that experience and skill level is not enough to eliminate risk associated with this type of skydiving. It is therefore important to evaluate ATTITUDES, MOTIVATION and MENTAL CAPACITY of the jumpers.

## Requirements

### Norwegian, known jumpers

- 500 jumps.
- D license.
- Jumper must have **read the compendium "Mountain Flying"** by Hans Christian Amlie.
- Jumper must follow the guidelines as described in the compendium.
- The jumper must be approved by the guide.

### Foreign and unknown jumpers

- 1000 jumps.
- D license.
- Jumper must have **read the compendium "Mountain Flying"** by Hans Christian Amlie.
- Jumper must follow the guidelines as described in the compendium.
- The jumper must be approved by the guide.
- The jumper must be recommended by jumpers the HI know and trust

### Guide

- In-depth experience with mountain flying
- Knowledge of current routes / areas

- Completed **the mountain flying guide course** organized by Skydive Voss
- Approved by HI

## **Planning the jump**

### Operational

- The jump shall be organized in the same way as an innhopp.
- See separate instructions, for HL, HM and HFL on innhopp (only in Norwegian)
- HFL should have information where the individual jumpers plan to fly and land. It may be that the jumpers have different primary landing areas.

### **Administrative**

- A mobile phone **MUST** be worn by all jumpers. All jumpers shall have the HFL's number.
- Not all areas in the mountains have mobile coverage, so do not have this as a false sense of security when selecting alternative landing sites.

### **Technical / Safety**

- A review of past incidents should be included as part of the brief.
- It should also be made clear that the complexity of a possible rescue mission in a remote area.
- A good plan for the jump is more important here than for a normal skydive. A good plan increases safety and enable the jumper to focus on the actual flying. As a jumper you shall be conscious of the weather conditions, the terrain you plan to fly in, and the jumpers you are flying with. As with a demo jump, the area shall be inspected and assessed from the current conditions. You should make a plan for the route you intend to follow. As a minimum you should decide which area you want to fly in. The choice of area must be made on the basis of the meteorological conditions. What is the wind direction, and with what strength? Where can you expect turbulence, etc. Look at the clouds and estimate wind direction and speed.
- Where is is turbulence today in relation to wind direction and strength?
- Where are thermals?
- Could there be rotors in the area, if so, where?
- Is video available from previous flights in the area?
- After you have made your assessment about the weather, locate any obstacles in the area you plan to fly.

- Are there power lines in the area and will these be between you and any of the landing areas?
- There are many factors to consider. As an experienced skydiver, and after reading the theory in the "Mountain Flying Guide", you should be able to make good judgments.

### **Brief of pilot**

The pilot brief is more extensive in mountain flying. Good planning of run-direction, exit-altitude and desired opening point is required. Consult further with the pilot about the strength and direction of wind relative to the area you will be flying in. Does he have any advice? Local pilots often have good knowledge of the meteorological conditions in the area where you plan to fly.

### **Run, exit altitude and opening point**

Exit and opening altitude is chosen based on the cloud base. Exit altitude shall be under the clouds and 2000 feet above the highest peak within a radius of 500 meters from the opening point.

Run-direction should be parallel to the valley. All exits should be in the centre of the valley, or a minimum of 500 meters from the nearest mountain.

### **Routine after opening**

- After opening, you should:
- Locate the other jumpers around you.
- Collapse slider and any attach this.
- Loosen the chest strap.
- Locate your primary and alternate landing areas
- Fly towards your chosen route.

### **Canopy flight**

- Always give yourself an exit during flight so that you can get out in the open air. Always have the opportunity to fly out from the ground.
- This is not the time to test new steering methods. Fly your canopy like you're used to.
- When you fly down a mountainside, the terrain will be steeper than the glide angle of your parachute. If not, you will land in the mountain, and you've chosen a bad place to mountain fly. When the terrain is steeper than your glide angle, the terrain has to be traversed. Fly back and forth and keep the route you planned to fly. By traversing this way you always have the opportunity to fly out to safety, by flying straight out from the mountain and into the valley. But how can we decide if the mountain is steep enough? This is difficult to judge on the basis of planning using map and contour lines. Using the Accuracy Trick can help you determine if the mountain is steep enough. When flying in one direction, the terrain will move in different directions. The point that is stationary will be the point we will land if we fly in the same direction and the wind is constant. We can use this trick also when mountain flying. One can easily check if a slope is

steep enough using the Accuracy Trick. As long as the point not moving is down at the landing site the glide angle of your canopy will take you down to where you want. Approach towards your planned route should therefore be such that one should not make more than 90 degree turn to start the route. If you for example fly 180 degrees on the scheduled route you have no ability to see when you have to turn in order to make the landing area and you are not able to use the Accuracy Trick.

- If you fly in terrain that can be categorized as the hills rather than mountains, the terrain can be too shallow to safely mountain fly. If you have no other option than to land in the hillside, the landing is often more successful if you land across the slope, not downhill or uphill. Trees are softer than the rocks.
- When flying in the mountains, the focus is on the canopy flight and terrain. Mountain flying is often associated with narrow and challenging landing areas. Therefore, during mountain flying, the final turn to landing shall be limited to a 90 degree approach. This is because landing sites are often unknown, combined with several skydivers landing within a short period of time.

### **Routine after landing**

- After landing, we must get control of our equipment and notify the HFL. HFL shall report back to the DZ and notify the HL / HFL on the status after jumping. Status is as follows:
  - Jumpers and canopies OK!
  - or:
  - Current status of jumpers landing off the planned landing areas. If jumpers have landed in the mountainside, appropriate action must be taken. Emergency rescue service is one option.
- It is often tactically wise to greet the landowner if he/she is at the site, and thank them for using the landing area, or apologize for landing off. Remember, there are probably other people that wants to use the same landing area in the future. Good contact with the local community is important for the parachute club. Notify the HL when landing outside the planned landing area and in case of any injury.
- A fixed schedule of feedback described in the “Veileder fjellflyving debrief” (below) shall be used in the debrief of the jump. Every video that can be meaningful to watch shall be debriefed.

### **Opening of new locations / routes**

Establishment of new locations / routes for mountain flying requires good preparation. This is to protect us against dangerous objects, and thorough reconnaissance of topographical and meteorological conditions is needed. Overview of established sites and routes will be established electronically and shall be available on request to HI.

### **Routines when opening new routes (in order):**

- **Preparation of open sources:**

- Google Earth / map
- Satellite Images
- Map
- **Contact the local landowner / locals:**
  - Collection of Info
    - Zip lines
    - Power lines/cables/wires
    - Other relevant info
  - Obtaining approval / landing permission from the landowner
- **Review of route:**
  - Go up the route on foot / overflight by helicopter
  - Fly route with sufficient height (above wires / zip lines)
- **Test Flying:**
  - Conservative flight to make yourself familiar with the route
- **Documentation of Information:**
  - Video / Photo
  - See next section

The following should, as a minimum, be documented in an electronic document (.doc including a relevant selection of the map):

**Position:**

- Placement of route and location / explanation
  - RT assignation as MGRS or UTM

**DROP point**

- Proposed point of DROP shall be specified
  - Described as LAT / LONG

**Route description**

- Flight route(s) shall be plotted on the map
- Described briefly in text form

**Challenges:**

- Hazardous area
- Dangerous objects
- Metrological challenges
  - Wind
  - Thermals
  - Etc.
- Lowest point / height for transportation to the landing area

# Guide for debrief of mountain flying

This guide is used during the debriefing of video as a reference point for dialogue.

The objective of using the gradient is to make the jumper and the debrief- group aware of each other's perception of risk and understanding of risk, and that it should be easy to communicate perceived risk.

The guide shall supervise the group debrief and provide feedback on how they categorize the flying.

Agenda for the debrief:

- Brief intro from the guide about the purpose and method for debriefing.
- Comments from the jumper before the video is shown: Plan for the jump, how the jumper flew the route, and their own assessment of the flight with the use of the color scale.
- Feedback from the guide on how to guide experienced the flight. Use the color scale.
- Feedback from the rest of the group on how they experienced the flight.



With the **risk awareness** means an intellectual understanding of a risk, as there is for example a high risk associated with mountain flying. This understanding is an evaluation based on all available information. The **perception of risk** is defined how a subjective experience or feel the risk. One can for example have a good knowledge of

the risk and understand this intellectually well (risk awareness), but the emotional experience of risk may be completely absent.