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BASE Oriented Canopy Control

Introduction: Fixed Object (BASE) jumping is a demanding pursuit. Safe participation depends on an ability to accurately evaluate many variables, manage your equipment, understand your limits and possession of a fundamental skill set. Without question the most important skill to posses is an ability to control your canopy in the demanding and high-pressure environment of a BASE jump.

These skills are best learned and perfected in the relatively safe environment of a skydive.
The following canopy control drills all represent real world situations. Practicing these drills using the canopy you will BASE jump will make you a safer, smarter and more confident BASE jumper.

All the following maneuvers should be executed and repeated to perfection on a Hop and Pop skydive. CR recommends a minimum opening altitude of 8000' AGL. Do not perform radical maneuvers or stalls below 500' without first practicing the maneuver at a safe altitude.

All drills that call for the loss of one or both steering toggles should be simulated by simply allowing the toggle(s) to retract against it's guide ring. To better simulate the actual loss of a steering toggle it is possible to use specially made toggles that allow the safe release of the steering line after deployment. Avoid the temptation to simply deploy the parachute with steering lines routed through the slider but not the guide ring as a premature toggle release in this situation can result in a severe slider entanglement.

HEADING AWARENESS:
One of the most common and potentially most dangerous canopy related problems is an off-heading opening. Being instantly aware of your deployment will speed your reaction and ability to promptly regain control.

Drill: On every opening anticipate your heading before the parachute has deployed. Be able to accurately recall the exact deviation. Learn how to steer your opening by shifting your weight in the harness.

HEADING CORRECTION:
When (not if) you open off heading on a BASE jump, you must be able to quickly bring the canopy back onto heading, or at a minimum, flying away from the object. The preferable method of accomplishing this is with the steering toggles. However, this is not always the fastest method. In some cases a riser correction is faster. However, radical riser input with the steering toggle stowed can easily stall a canopy. Learning the proper amount of riser to pull without stalling is a valuable skill. An opening canopy that has been deployed with a slider will turn much faster while the slider is still above the cascades. Thus it will have a greater tendency to open off heading if deployment speeds are too low.

Drill: After opening, with the brakes still stowed, initiate a hard 180 turn using a rear riser. Note how the canopy responds. At what point of riser input does the canopy turn the fastest? When does it stall or partially stall? Repeat this drill until you can accurately use riser input to turn the canopy back on heading without inducing a stall.

Drill: With toggles stowed, practice depressing both risers simultaneously in an effort to stall the canopy backward from an object. This technique is used to avoid an immanent object strike. After the canopy has slid away from the object, release riser input on one riser to generate a turn away from the object. **WARNING: This maneuver consumes a lot of altitude. Be cautious about executing it close to the ground especially on a BASE jump.**

STALL RECOVERY:

BASE canopies are traditionally packed with the deployment brake setting relatively deep. It is possible that a canopy with brakes set too deep can open in a stall. A stall is also very possible as a result of radical maneuvers executed to avoid an object strike. Occasionally you may want to intentionally stall your canopy to help with a difficult landing approach. All of these situations dictate that the jumper be capable of a controlled and rapid stall recovery. A proper BASE jumping canopy will posses excellent stall recovery characteristics. And exhibit a minimum loss of altitude when recovering.

The first part of stall recovery is stall recognition. A violently stalled canopy will rock backwards and often buck or surge forward in an effort to find it's equilibrium. This is easy to recognize. A canopy experiencing partial flow separation will not exhibit such marked behavior. The clue that the canopy is entering a stall is noticeable only from an accelerated rate of decent and lowered toggle pressure. Close to the ground this can be very dangerous.

Drill: After opening with the brakes still stowed, pull down both rear risers until the canopy stalls. Slowly release the risers only to the point that the canopy begins to pitch nose-down and starts flying forward. Do not radically release the risers during stall recovery, as this will cause the canopy to pitch forward losing altitude and further delaying your ability to control the canopy.

Drill: From full flight, slowly depress the toggles until the canopy slows and stalls. Practice stall recovery both from the point of stall recognition and also from the point within the stall that the canopy begins to slide backwards. The more violent the stall - the more violent the recovery. However, proper riser control will minimize this effect.

ASYMETRICAL HEADING CONTROL:

Due to the fact that we pack our canopies for slider down deployments with the steering lines routed outside the guide rings it is possible that you will find yourself with one toggle stowed and the other missing. This can occur as a result of a premature toggle release during deployment, inadvertently dropping a toggle after unstowing or even control line failure. Additionally, in the event of a line-over malfunction the jumper will intentionally release one or both toggles to clear the line-over.

Flying with one toggle stowed and the other missing will generate a noticeable turn. It is important that you are comfortable maintaining proper heading until the remaining toggle can be safely unstowed.

Drill: From full flight, release one toggle and allow it to retract against the guide ring. Practice maintaining heading by using the rear riser. From this configuration, practice left and right turns, stalls and stall recovery.

BRAKED TURNS:

A canopy turned from full flight will carve an arc. This uses a lot of vertical and horizontal space.
A braked turn involves initiating a turn when the canopy is being flown in at least 30% brakes.
These types of turns require much less altitude and horizontal space. This technique works very well for a low turn or turning in a confined space. There is however, a greater possibility of inadvertently stalling the canopy.

Drill: From half brakes initiate a turn by depressing one toggle while leaving the other at 50%. Note how the canopy pivots more than carves. Repeat this maneuver with the canopy in progressively deeper brakes and note the point at which the turn creates a partial stall. To minimize or eliminate this, release some input on the other toggle as you make the turn. Generally, the slower the canopy is flying when you initiate this maneuver the more opposing control stroke you will need to release.

DEEP BRAKE APPROACHES AND NON-FLARED LANDINGS:

Many BASE jumps have small landing areas requiring a steep final approach to landing. Often there is insufficient room to allow the canopy to fly at full speed prior to flare. It is important to become familiar with how your parachute flies while in deep brakes so as increase your accuracy ability and avoid unintentional stalls close to the ground. A proper BASE canopy will be capable of landing safely with out a full flight flare. However, this requires some practice and an awareness of conditions to safely execute.

Drill: At a safe altitude practice flying the canopy in 75% brakes making slow S-turns and noting the canopy's of decent. On landing, fly the entire landing approach in at least 50% brakes and flare from this position. After gaining confidence with this technique try it with progressively steeper approaches. NOTE: landing into the wind makes this type of landing very easy. Landing downwind makes this type of landing hurt. Also, it is not recommended to attempt this drill using a highly loaded canopy.

FRONT RISER LANDINGS:

Airspeed is converted into lift when we initiate a dynamic flare. Given this, if we build airspeed prior to landing the canopy will land in a more dynamic fashion. This technique can be used to improve landing performance when landing at high altitudes.

Drill: During the last 100' of your final approach, pull both front risers down several inches while simultaneously holding the steering toggles. At your normal flare altitude release the front risers and commence your flare. It is strongly recommended that you hold the toggles while pulling the risers to avoid the possibility of missing a toggle at flare time.

REAR RISER LANDINGS:

In the event of lost or broken steering lines or after clearing a line-over malfunction you may find yourself forced to fly and land your canopy using rear risers. A canopy will fly very differently from rear risers especially if the control lines have been released. The control lines act as support for the rear 25% of your canopy. Without them the canopy will tend to pitch nose down and generate less lift. Additionally, control input from the rear risers has a very different effect on your canopy than does toggle input. Toggle input increases drag and momentarily increases lift on one side of the canopy. Conversely riser input distorts the rear of the canopy, drastically compromising lift and causing the canopy to turn.

Drill: Practice this maneuver at altitude by flaring the canopy from full flight with the rear risers. Do not attempt to release or untie a steering toggle. This is a simulation only. Most canopies will require only a few inches of riser input to generate a flare. The canopy will momentarily pitch nose up and then stall. For this reason, when actually landing with rear risers you should commence your flare later than normal. Also, In an actual emergency if you have possession of one steering toggle, flare using the riser and toggle. The benefit of this, as mentioned above, is by keeping the toggle your canopy will fly and land better.

FLYING A CLASSIC LANDING PATTERN:

A classic landing pattern is one that utilizes a downwind, base and final leg. This structured approach to your landing area will provide the highest degree of consistency to your accuracy as well as the safest way to judge your position in space. Not all BASE jumps allow for this approach but understanding the principals and application of this technique will improve your canopy control and landing accuracy.

Drill: As you fly down - wind of your intended landing area, take note of your ground speed so that your next 90 degree turn onto the base leg can be properly timed. Make your turns onto both base and final legs from 50% brakes. This will allow you the luxury of either slowing (steepening) or speeding (flattening) your approach to the target.

PARACHUTE LANDING FALL:

The Parachute Landing Fall or PLF is a technique used to spread the load if impact over the largest surface area possible thereby minimizing damage to your body. It is not often needed but knowing how to properly execute a PLF can save you from injury in an emergency. In the event you find yourself forced to land a crippled canopy or simply slip off a ladder a good PLF can make the difference between a bruise and a cast.

Drill: The PLF can be practiced on the ground in any grassy or soft area. Start by standing on the ground and, as your technique improves, jump from a chair. With your feet and knees together, knees slightly bent, practice “hitting and rolling”. Think of five point of contact: feet, calves, thighs, shoulder and back. The idea is to dissipate the force of impact along the long axis of your body and then convert the momentum onto a roll across your back. Be sure to keep your arms and elbows at your side.