



## **Canopy Formation & Canopy Relative Work Briefing**

The Canopy Formation (CF) and Canopy Relative Work (CRW) ground briefing is designed to educate jumpers with the knowledge required to participate in near or with other jumpers while under canopy. **The purpose of this document is to provide the safety foundations and is not intended to instruct CF or CRW activities.**

This Ground Briefing is to be administered by a Coach 2 (preferably with CF experience) or a Coach 3 - CF. The briefing is meant to be a ground briefing and although not a requirement for the B CoP, contains valuable information for jumpers working towards their B CoP.

In this document, you will find related safety topics to be discussed during this ground briefing, as well as a detailed explanation of each one:

- 1) Planning
- 2) Equipment
- 3) Spotting
- 4) Communication
- 5) Safety Considerations, Unusual Situations & Emergencies

### **Introduction**

CF/CRW is an advanced method of canopy flying involving intentionally flying canopies near (flocking) or in contact with others. Before you attempt your first jump, it is vital that you understand the extra safety precautions that will be required. It requires special considerations to exit orders, equipment, planning and communication. If you are flying near someone, you are conducting relative work under canopy.

The following is an explanation of the basic information required to safely begin your path towards flying with others under canopy. This document does not replace instruction from a qualified coach in accordance with Technical Recommendation 3.20. In fact, coaching is very important and strongly recommended.

### **1. Planning**

CF/CRW requires advanced planning. When beginning to learn, it is important that all activities are pre-planned and not just “spur of the moment”, and are done with someone who is experienced and proficient in CF/CRW.

Planning should include:

- Equipment compatibility
- Similar wingloading as partner
- Local DZ rules

- Being well aware of winds, directions, hazards and outs
- Intentional CRW jumps require coordination with the DZ and pilot when planning your spot
- Understanding your canopy glide ratio ahead of time
- Discuss exit separation and pull delay
- Brief the pilot on the desired jump run course, altitude and distance.
- Make sure that the CRW pilot navigation allows for all participants to remain at al altitude and a distance to reach the DZ for landing.
- Make sure that the flight path of the canopy formation remains away from the next jump run axis and following freefall jumpers.

## **2. Equipment**

There is no special equipment required to intentionally fly near someone, however when participating in linked canopy formations there are a number of equipment considerations and equipment specially made for CF:

- CF canopies are typically a 7-cell canopy with nose cells that are reinforced for the additional stress that linking canopies cause
- Many CF canopy designed are not intended to be opened in terminal velocity and may not utilize a deployment bag
- CF lines are typically made of a high abrasion resistant material such as Dacron. As some formations in CF involve a jumper sliding down lines, abrasion resistance is important
- The centre A and B lines are non-cascaded in order to facilitate sliding down the lines without entanglement
- Cross connector straps may be installed for jumpers to “hook” their feet into between front/ rear risers
- Using jump data instruments may aide the new jumper in understanding the performance characteristics of their canopy
- The use of RSLs may not be desirable
- Jumpers may utilized radio headsets for communication
- 2 hook knives are required when docking

## **3. Spotting/ Exiting**

Spotting for CF/CRW involves:

- Predetermining and understanding the winds at various altitudes while on the ground
- Exit order will be determined by which altitude that you are planning on doing CF/CRW from – if a team is doing CF/CRW from full altitude, it is not required that they exit last
- It may be desirable for CF/CRW jumpers to be on a separate pass.
  - If more than one pass required: It may be necessary to offset the second pass and to change the exit altitude. Plan the other jump run offset path and altitudes.
  - If more than one aircraft is used for a big formation, advise the pilots of the trailing aircraft the optimum horizontal and vertical distance required from the lead aircraft for a safe and efficient exit.
- Your exit position will depend on the wind direction and strength
- If winds are light – CF/CRW may exit first heading towards the dropzone. If winds are strong – CF/CRW may wish to exit last, to let the wind fly them backwards to the dropzone.
- Avoid turbulent areas and areas of poor visibility
- Maintain heading control, visual contact and give a good, stable reference to other members of your CRW team

#### 4. Communication

Communication plays an important factor in CF/CRW jumping for both a safety aspect and in order to conduct the planned CRW activities. The purpose of this briefing is to cover basic communication signals as it pertains to safety:

##### A. Verbal Communications

As jumpers will be flying near one another, verbal communications may be used. Verbal communication should be short, easy to understand and shouted to ensure clear, effective communication.

**Incoming:** Shouted by anyone who is second or two canopies away from docking on another jumper. This alerts the jumper so they are ready to accept the dock.

**Get out:** The command given to someone who is trying to dock on a formation in an unsafe manner.

**Complete:** Shouted by the person making the final dock in the formation, this signals that the point has been built.

**Drop-me:** Lower jumper wants to be let go from the formation.

**Hold-me:** The command given in CF when a jumper does not want to be let go from the formation.

**Starburst:** The command given by the pilot, to which everyone responds. The pilot then begins a countdown. At two, everyone has their hands on the controls. At 'break', everyone separates.

**Break:** Separation

**Break it Down:** A signal that can be triggered by any jumper. The aim of which is to dismantle the formation in the reverse order of its construction.

##### B. Non-verbal Communications

Despite being relative to one another, it may be difficult to clearly understand verbal communications. There are a number of widely used hand and leg signals such as:

**Crossing legs:** No more CF

**Moving left or right leg:** Turn left or right

**Waving legs:** Break off

**Pointing up:** Rear riser

**Pointing down:** Front riser

**Zig-zag with hands:** Sashay

**Rotating the ankle left and right:** the tension on the ankle is too strong (get light).

**Raising and lowering the foot:** the tension on the ankle is not sufficient (heavy or trim)

## 5. Safety Considerations, Unusual Situations and Emergencies

### A. Safety Considerations

It is important to recognize that there is an increased safety risk involving CF/CRW. Review all emergency procedures regularly particularly as it pertains to canopy wraps and entanglements. Some basic safety considerations as a beginner in CF/CRW include:

- Do not get tunnel vision and be aware of other canopies around you
- Do not attempt to dock below 2000'
- Keep groups small. Limit to one other person when beginning
- Dedicate full jumps to focus on CF/CRW
- Be aware of turbulence generated from behind other canopies
- Do not attempt CF/CRW with a reserve parachute
- Avoid clouds and do not dock in a cloud
- Break formations above 1500' unless you intend to land them
- The CRW formation pilot must keep an optimum situational awareness including his position relative to the jump run and the dropzone in order to remain clear of the other jumpers vertical flight path and be at an horizontal and vertical position allowing all CRW jumpers to reach the DZ for landing.

### B. Unusual Situations/ Emergencies

Unusual situations in canopy formation can be divided into two categories: entanglements and wraps. An entanglement occurs when two or more canopies become entangled with each other. A wrap occurs when a canopy becomes wrapped around another jumper's body. In spite of precautions taken to avoid them, wraps and entanglements do sometimes occur.

The first step toward surviving an emergency situation is to have a plan prior to the onset of the emergency. Your plan should take into account the experience of those who have come before you, as well as careful analysis of errors committed by others, and by yourself. You should not, however, limit yourself to one course of action. A primary plan is necessary, but don't limit yourself to a single emergency procedure and convince yourself that it is going to work every time.

The second step toward surviving an emergency situation is to practice your emergency procedures. You should go over your plan until it becomes second nature to you. Review your emergency procedures before each skydive.

In any CF/CRW emergency, communication is key. Clear words should be used and avoid using words that may be misinterpreted – "Don't cut away" may be misheard as "Cut away. The best way to avoid a CF/CRW emergency is to take a slow, staggered approach, do not rush "getting in" and if things aren't working out its best to back off and try again. Theres always another jump! Poor docks are often the cause of a wrap or entanglement.

#### **Wraps:**

A wrap can be compared in severity to a low-speed malfunction. With sufficient altitude, there will be time to consider the situation and deal with it one step at a time. The canopy of the top jumper should remain inflated, giving you substantially more time to deal with the situation than you would have in a high-speed malfunction.

The most important rule in dealing with a wrap is that the bottom jumper must cut away first and must cut away only when instructed to do so by the wrapped jumper. It is very important that the bottom jumper does not cut away without specific instruction from the wrapped jumper. The cut-away canopy may behave unpredictably and can make a tricky situation much worse.

- Usually, the wrapped jumper can extricate themselves from the wrapped canopy by sliding it down their body. If they are unable to do this, it may be necessary for the bottom jumper to cut away in order to release tension on the canopy. This decision belongs to the wrapped jumper. The lower jumper should ask about progress. In the absence of a response or progress, the lower jumper should ask themselves “What is the simplest thing I can do now to make the biggest change?” The lower jumper can decide to cutaway upon reaching the critical point of Decision Altitude (DA) that has been pre-determined by the group. If a problem happens below the DA, then the jumper has until the Hard Deck to cutaway, otherwise they will be landing together.

Always maintain altitude awareness in an emergency situation. Just like a low-speed malfunction, there is a limited amount of time to deal with a wrap.

If the wrapped jumper cannot completely extricate themselves, and if altitude is running out, they may simply control the fabric of the wrapped canopy as best as possible, and then give the command for the lower jumper to cut away. The wrapped jumper may land with the wrapped canopy tucked between their legs.

### **Entanglements:**

An entanglement occurs when a skydiver's body or canopy passes through the lines of another canopy. This causes the two canopies to become entangled, with the jumpers dangling beneath the partially inflated or completely collapsed canopies.

In an entanglement, the two jumpers will usually orbit around the entangled canopies. The rotation may be very rapid, and the jumpers may tumble violently as the canopies fight for control.

Entanglements will often not clear themselves. Altitude permitting, jumpers may take a moment to determine if the canopies will disentangle on their own.

The general rule with entanglements is that the top jumper should cut away first. If the bottom jumper cuts away first, their risers and lines may recoil into the top jumper, which could make the situation much worse.

In dealing with an entanglement, it is important to maintain altitude awareness and communicate with other jumpers involved in the entanglement.