



# Category E Training Aid

All training to be conducted by instructors of the:



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# Learning How to Spot

## One Jump at a Time

Before earning a USPA A license, you are expected to learn to spot in routine conditions. "Spotting" simply means choosing the opening point and guiding the pilot to the correct position over the ground for exit. You can calculate the spot from a winds-aloft report. FAA Flight Service provides these reports, which you can get from the pilot. StartSkydiving.com posts these reports outside of manifest daily.

When you're in the door before exit, spotting starts with determining exactly what's straight down and how the plane is moving across the ground. A good spotter's training never ends.

Here are some tips for beginners:

- 1. Be familiar with the DZ and surrounding area**, including the correct exit and opening points for the day's conditions. The USPA Instructor will simply tell you at first and then show you how to figure it for yourself later.
- 2. Look out of the aircraft**, obviously done best with the door open and your head all the way outside. Small aircraft give you more opportunities to practice spotting. In larger aircraft, your instructor will arrange some door time. First, just get comfortable looking out. Put your head all the way out into the wind stream.
- 3. Identify the DZ**, the climb out point, and exit point from the open door of the aircraft. Point them out to your instructor or coach.
- 4. Look straight down**, using horizon reference points. Avoid using the aircraft as a reference. On jump run, the plane is often climbing, banking, skidding, or crabbing.
- 5. Determine the track of the aircraft**. Once you can identify two points straight below the plane on jump run, you know the actual path of the aircraft across the ground. If you see that it will take you too far to the left or right, suggest a correction to the one supervising your jump, who will relay your corrections to the pilot.
- 6. Allow enough time (distance)** for your climb out and set-up to separate you from other jumpers. Learn when to climb out.

Soon, you'll give directions to the pilot under supervision. After a while, the USPA Instructor or Coach won't interfere unless your spotting appears unsafe.

Your spotting training will require several jumps, and the staff will log your progress. Spot as often as you can during your training as a student so you'll feel confident later when you're on your own.



## Category E

### Two jumps

This is the last category that distinguishes between students of different disciplines. Once you have demonstrated the ability to regain stability and control within five seconds after initiating a disorienting maneuver, a USPA Instructor in your discipline may clear you to jump without instructor supervision in freefall. At that point, any USPA Instructor may perform gripped exits with you, as well.

From Category E on, a USPA Instructor makes sure you are properly trained and supervised on each jump. In Category E, you practice non-poised (door) exits and aerobatics to increase your confidence, awareness, and control in freefall. You should by now be jumping from the highest altitude available at your drop zone. Under canopy, you'll practice for softer landings by looking for the "sweet spot" in the flare stroke that provides the best lift for that canopy. The goal is to flare your canopy to fly as flat as possible until you begin to touch down. The USPA Instructor will also remind you of your responsibility (and every jumper's responsibility) to observe and steer clear of other canopies. By the end of Category D, you should have been able to land within 50 meters of the target with minimal assistance. In Category E, you should be able to do it on your own.

Part of the emergency procedure review includes a detailed discussion on preventing premature openings in freefall and more detailed procedures for two open canopies. A rigger or USPA Instructor will introduce you to the open parachute system to identify its key components, along with the FAA's rules for packing parachutes. Supervised packing begins in Category F.

You'll discuss weight, balance, airspeed, jump run procedures, and aircraft emergency procedures, usually with a jump pilot. A jump pilot or USPA Instructor also shows you how to read a winds-aloft report. From that information, you'll learn to calculate the best opening point over the ground. In Categories E through H, you're expected to select and prepare your equipment for jumping (with the supervising USPA Instructor's advice), including obtaining all recommended pre-jump equipment checks. You're also learning to spot, where to sit in the aircraft, and to allow enough distance between the jumpers exiting before you. You should know the surface winds and plan the appropriate landing pattern.

### **Learning and Performance Objectives**

- Non-poised (door) exit.
- Recovering stability and awareness.
- Freefall aerobatics.
- Canopy stalls.
- The canopy's "sweet spot".
- Two canopies deployed (review).
- High-wind landings.
- Reserve static line.
- Open parachute orientation.
- Parachute packing and supervision.
- Wind limits for students.
- Aircraft briefing.
- Aircraft emergency procedures.
- Selecting the opening point.

**In order to be cleared to student self-supervision by a USPA Instructor, you must have obtained the following skills and knowledge:**

1. Demonstrated the ability to regain stability and control in freefall within five seconds after initiating a disorienting maneuver.



2. Demonstrated sufficient canopy control skills to land safely in all expected conditions.
3. Demonstrated how to select and inspect gear before use.
4. Demonstrated ability to spot the aircraft and make a reasonable judgment regarding exit points.
5. Obtained knowledge of both normal and emergency aircraft procedures for all aircraft types in common use at StartSkydiving.com. (Cessna Caravan, Cessna 206)

## **Rules and Recommendations**

### 1. Winds:

- a. Students are limited to 14 mph (ten mph for round reserves).
- b. A USPA Safety & Training Advisor may file a waiver for students to jump in higher winds.
- c. Licensed jumpers must exercise judgment.

*Note: StartSkydiving.com is waived to 16 mph for ram-air-canopies.*

- ### 2. The FAA publishes rules for the periodic inspection and repacking of the main and reserve parachute system.

No person may conduct a parachute operation using a single-harness, dual-parachute system, and no pilot in command of an aircraft may allow any person to conduct a parachute operation from that aircraft using a single-harness, dual-parachute system, unless that system has at least one main parachute, one approved reserve parachute, and one approved single person harness and container that are packed as follows:

- a. The main parachute must have been packed within 180 days before the date of its use by a certificated parachute rigger, a non-certificated person under the direct supervision of a certificated parachute rigger, or the person making the next jump with that parachute.
- b. The reserve parachute must have been packed by a certificated parachute rigger:
  - (1) Within 180 days before the date of its use, if its canopy, shroud, and harness are composed exclusively of nylon, rayon, or similar synthetic fiber or material that is substantially resistant to damage from mold, mildew, and other fungi, and other rotting agents propagated in a moist environment or
  - (2) Within 60 days before the date of its use, if it is composed of any amount of silk, pongee, or other natural fiber, or material not specified in paragraph (b)(1) of this section.
- c. If installed, the automatic activation device must be maintained in accordance with manufacturer instructions for that automatic activation device.

## **Equipment**

1. Review the parts of an open parachute system (Page 97) and the Open Parachute Orientation (below) to prepare for packing lessons.



2. Typical characteristics of elliptical canopies, compared to rectangular canopies of the same size and material:
  - a. Flatter glide for same airspeed.
  - b. Faster turns.
  - c. Greater loss of altitude in a turn.
  - d. May continue to dive after stopping control input following a turn.
  - e. Slower, less predictable opening (some models).
  - f. Shorter toggle stroke for flare (some models).
  - g. Quicker, more abrupt stall (some models).
3. The stall speed of any wing increases with higher wing loading:
  - a. More suspended weight.
  - b. Sudden maneuvers, such as flaring hard after a dive.

## Open Parachute Orientation

A rigger or USPA Instructor will introduce you to the parachute system when it is unpacked. You will learn the common points of parachute wear and maintenance requirements during Category G. Assembly and maintenance of the three-ring release is covered in Category H.

1. Packing is a function of identifying and organizing the parachute.
2. Identify:
  - a. Pilot chute, bridle, and collapsing system.
  - b. Deployment bag or other device.
  - c. Pilot chute attachment.
  - d. Top skin and discuss the different characteristics of F-111 (0-3 cfm) and zero-P fabric.
  - e. Packing tabs.
  - f. Bottom skin.
  - g. Leading edge (nose).
  - h. Trailing edge (tail).
  - i. Center of tail (warning label or tab).
  - j. Stabilizers
  - k. Manufacturer's label (to identify end cell).
  - l. Slider stops.
  - m. Loaded and unloaded ribs.
  - n. Crossports
  - o. A, B, C, D, and brake lines.
  - p. Line cascades, including brake lines.
  - q. Slider and slider grommets.
  - r. Connector links and link protectors.
  - s. Risers and brake system.
3. Review and discuss (preferably with an FAA rigger) FAR Part 105.43.a and b:
  - a. Who may pack a main parachute.
  - b. How often it needs to be packed.
  - c. Rigger supervision of non-certified packers.



## Learning to Spot

### 1. Spotting:

- a. How to read a winds-aloft report.
- b. Jump-run procedures.
- c. Spotting corrections.
  - (1) Manual (hand signals, shoulder taps).
  - (2) Electronic (spotting buttons and lights).
  - (3) Verbal

### 2. The effect of winds during canopy descent:

- a. A canopy descends at approximately 1,000 feet per minute.
- b. Divide the opening altitude by 1,000 feet to determine time of descent, e.g., 3,000 feet = three minutes of descent.
- c. Estimate in miles per minute the amount of drift during descent, as in Table E.1:

<b>MPH Miles per Minute Drift from 3,000 feet</b>		
60	1	n/a
30	1/2	n/a
20	1/3	1 mile
15	1/4	3/4 mile
10	1/6	1/2 mile
5	1/12	1/4 mile

Table E.1 - Estimating drift from 3,000 based on wind speed.

3. Calculate the drift under canopy from 3,000 feet, based on the average of the known winds and a canopy descent rate of 1,000 feet per minute, to choose the correct opening point-example:

#### **Winds (forecasted and observed):**

<b>Altitude</b>	<b>Heading</b>	<b>Speed (mph)</b>
3,000 AGL	280	20
Surface	260	10
Average	270	15

Use Table E.1 above to estimate the canopy's drift during a 3-minute descent in winds averaging 15 miles per hour:

#### **Drift:**

<b>Open</b>	<b>Time</b>	<b>Distance</b>	<b>Heading</b>
3,000 AGL	3 min	$\frac{3}{4}$ mi	from 270

Average the wind direction and velocity to estimate drift after opening at 3,000 feet above the ground.



## Alternate Method for Calculating Freefall and Canopy Drift

Example for Calculating Freefall Drift:

Altitude	Heading	Speed (mph)
3,000 ft	250	15
6,000 ft	260	18
9,000 ft	270	20
12,000	290	25
<i>Average</i>	<i>270</i>	<i>19.5</i>

To simplify the process, convert mph to mile per minute (mpm) (assuming a 1-minute freefall)

$$\frac{19.5 \text{ mph}}{60} = 0.33 \text{ miles}$$

Freefall drift is equal to .33 miles at 270 degrees.

Example for Calculating Canopy Drift:

Altitude	Heading	Speed (mph)
Surface	180	12
3,000 ft	200	18
<i>Average</i>	<i>190</i>	<i>15</i>

$$\frac{15 \text{ mph}}{60} = 0.25 \text{ miles}$$

Assume 4,000 ft opening altitude (i.e. 4 minutes under canopy):

$$0.25 \text{ miles} \times 4 \text{ minutes} = 1 \text{ mile @ } 190 \text{ degrees.}$$

- Canopy descent time from 3,000 feet (at 1,000 feet per minute): three minutes
- Total (uncontrolled) drift at 1/4 mile per minute: 3/4 mile
- Ideal opening point: 3/4 mile due west

4. Observe and ask jumpers on a previous load about the wind conditions and spot.

5. Jumper procedures during jump run.

- The pilot determines when the door may be opened and may prefer to operate the door.
- Look below to:
  - Check for clouds.
  - Check for aircraft.
  - Verify the jump run is correct.
- When the pilot gives the OK to jump (green light near door will illuminate), verify that the aircraft is the desired distance from the drop zone and begin exit procedures.

6. Be sure to establish communications for spotting corrections with the pilot prior to flight.



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## **Aircraft Briefing**

The following briefing for Category E students covers the interaction between the jumpers, the aircraft, and the pilots:

1. Sufficient airspeed is necessary for flight; without it, the aircraft wing stalls.
2. Weight:
  - a. Aircraft weight limits are specified in the aircraft owner's manual and other documentation and, by law, may not be exceeded.
  - b. Weight includes:
    - (1) Fuel
    - (2) Occupants
    - (3) Skydiving equipment.
    - (4) Other (jump seats, oxygen systems, etc.)
  - c. The weight must be calculated for each load.
3. Weight distribution (center of gravity):
  - a. The load in an aircraft must be distributed within center of gravity limits to fly.
  - b. Limits are published in the owner's manual and other documentation.
  - c. The pilot must calculate and monitor weight distribution for each flight.
  - d. Jumpers moving around the aircraft can place the load out of limits:
    - (1) In aircraft with a door in the rear, some jumpers must remain forward as groups congregate near the door.
    - (2) Large groups planning to exit together should inform the pilot.
4. Seat belts:
  - a. Prevent injuries in an emergency.
  - b. Maintain the load within the center-of-gravity limits.
5. Jumpers outside the aircraft:
  - a. Can block air flow to the control surfaces.
  - b. Add drag that makes it harder to maintain the necessary airspeed.
  - c. When floaters (outside the aircraft) are out, jumpers must exit quickly to reduce the effect of drag.
6. Apply the concept of weight, balance, and drag to aircraft at the DZ. (Cessna Caravan, Cessna 206)
7. Aircraft emergency procedures.
8. Discussion on the sections of FAR 91; only the sections pertinent to skydiving are included there.



## **Exit and Freefall**

1. Stable door (Non-poised) exit:
  - a. Position for the best launch.
  - b. Present the front of your hips to the relative wind.
  - c. Exit in a neutral position with your legs slightly extended (better stability).
  - d. Maintain your arch as the relative wind changes from ahead to below after exit.
2. Recovering from exit and freefall instability:
  - a. Altitude, arch, legs, relax (review).
  - b. If falling stable back to earth although arching, briefly retract one arm and look over that shoulder at the ground to return face-to earth (half barrel roll).
3. Barrel rolls, back loops, and front loops (instructor's preferred technique):
  - a. Try barrel rolls first, because they have a built-in recovery component from back-to-earth.
  - b. Any two disorienting maneuvers with recovery and reorientation within five seconds qualify you for self-supervision in freefall (the same one may be used twice).
  - c. Demonstrate full control by completing all three maneuvers within 60° of the initial heading.
4. Rolls, loops and other freeflying maneuvers result in faster and erratic fall rates; check altitude often.
5. Visual altimeters, especially when chest-mounted, may be unreliable during inverted positions.

## **Emergency Procedure Review**

1. Preventive measures for two open canopies:
  - a. Deploy the main parachute at the correct altitude to avoid AAD activation.
  - b. Initiate malfunction procedures high enough to cut away safely and avoid AAD activation.
  - c. Maintain and correctly operate hand-deployed pilot chutes, especially collapsible pilot chutes.
  - d. Protect your equipment before exit to prevent pins or handles being knocked loose.
2. Various scenarios can result in having both parachutes deploy with one of the following outcomes.
3. One canopy inflated, another deploying.
  - a. Attempt to contain the deploying reserve or main canopy and stuff it between your legs.
  - b. If the second canopy deployment is inevitable and there is sufficient altitude, disconnect the reserve static line and cut away the main.
  - c. If the second deployment is inevitable and there is insufficient altitude for a cutaway, wait for inflation of the second canopy and evaluate the result:
    - (1) The two open canopies typically settle into one of three configurations, biplane, side-by-side, or downplane.
    - (2) Trying to force one configuration into a more manageable configuration is typically futile and can be dangerous.



4. Stable biplane:

- a. Release the brakes on the front canopy or steer the canopy gently using rear risers.
- b. Leave the brakes stowed on the rear canopy.
- c. Steer the front canopy only as necessary to maneuver for a safe landing.
- d. Use minimal control input as necessary for landing.
- e. Perform a parachute landing fall (PLF).

5. Stable side-by-side:

- a. Release the brakes of the dominant canopy (larger and more overhead) or steer the canopy gently using rear risers.
- b. Steer the larger canopy only as necessary to maneuver for a safe landing.
- c. Use minimal control input as necessary for landing.
- d. Land without flaring and perform a parachute landing fall (PLF).

6. Downplane:

- a. Disconnect the reserve static line if altitude permits, cutaway the main canopy and steer the reserve to a normal landing.

7. Main-reserve entanglement:

- a. Attempt to clear the problem by retrieving the less-inflated canopy.
- b. Perform a parachute landing fall (PLF).

8. Procedures for high-wind landings:

- a. Before landing, disconnect the RSL as a precaution in case a cutaway becomes necessary to prevent being dragged.
- b. Choose a point to the side or well downwind of any obstacle that may generate turbulence.
- c. Land using a PLF and pull one toggle in as quickly as possible until the canopy collapses.
- d. After landing, cut away if necessary.

## **Canopy**

1. Types of stalls:

- a. An aerodynamic stall is a stable, steady-state stall, or sink, with decreased glide and increased rate of descent:
  - (1) Associated with older designs and specialized accuracy canopies.
  - (2) May not be achievable with newer, flatter-gliding canopies, which often fly flatter almost until a full stall.
- b. A dynamic stall occurs at the end of a flare when the jumper begins to rock back under the canopy and the canopy begins to nose forward:
  - (1) Associated with a sharp dive.
  - (2) May signal a full stall.



- c. A full stall occurs when the trailing edge (tail) is pulled below the leading edge (nose) and the canopy begins to fly backwards:
  - (1) Collapses the canopy.
  - (2) May result in unrecoverable line twist in smaller, more highly loaded wings stall with the toggles (a back riser stall may be more controllable).
  - (3) May be contrary to the manufacturer's recommendations.
  - (4) May result in entanglement with the jumper if released too abruptly.
  - (5) May result in injury if done too low.
2. Raise the controls smoothly after any stall to avoid diving and partial collapse.
3. Proper flare technique:
  - a. Keep your feet and knees together to maintain heading during the landing flare (level harness).
  - b. Flare with the hands in front to provide visual feedback for level control.
4. Discovering the best landing flare ("sweet spot") for the canopy being jumped (nine practice flares):
  - a. From full glide, flare to a mid-point in the toggle range:
    - (1) Approximately the bottom of the rib cage.
    - (2) At a medium rate of flare.
  - b. Feel the amount and duration of lift before the stall.
  - c. Return gently to full flight for at least ten seconds.
  - d. Repeat to the same depth:
    - (1) Once at a faster rate.
    - (2) Once at a slower rate.
  - e. Compare the strength and duration of the lift before the stall.
  - f. Flare at three different speeds to a point deeper in the toggle stroke, approximately at the hips.
  - g. Flares at three different speeds to a higher point in the toggle stroke, approximately at the shoulders.
  - h. Compare the flares to determine the stroke rate and depth that produces the maximum combined strength and duration of lift for that canopy.
5. Best flare height above the ground:
  - a. Use the best flare procedure (discovered during the nine practice flares) upon landing, beginning one body height above ground.
  - b. Flare to minimum descent (or flat) and hold that toggle position when the glide begins to flatten.
  - c. Smoothly continue the toggle stroke to maintain the flat glide.
  - d. If the canopy begins to stall and drops several feet, begin the flare that much lower on the next jump.
  - e. If you don't achieve the flattest glide before landing, begin to flare slightly higher on the next jump.
  - f. If you flare to high, never return your canopy to full flight. Raise your hands to waist height and PLF.
6. Review of traffic avoidance procedures:
  - a. Watch for other traffic, especially upon entering the landing pattern.
  - b. The most dangerous point of the pattern occurs when two jumpers on opposite base-leg approaches turn to final approach.
  - c. The lower canopy has the right of way, but one jumper should not maneuver to assert right of way over another.
  - d. It takes two people to have a collision, but only one to avoid it.



## Category E Quiz

(Must be passed before Category E jump)

- 1. What happens to a jumper's fall rate when performing rolls, loops, or other freeflying maneuvers?**
  - a) Increases.
  - b) Decreases.
  - c) Stays the same.
- 2. What happens to a visual altimeter when it's in the jumper's burble?**
  - a) Reads unreliably.
  - b) Nothing.
  - c) Reads high.
- 3. What is the best way to recover from a canopy stall to full glide?**
  - a) Quickly counteract with toggle input.
  - b) Pull legs up into a tight ball.
  - c) Smoothly raise the controls.
- 4. Describe an aerodynamic stall as it applies to a ram-air canopy;**
  - a) Sudden state of increased glide and increased rate of descent.
  - b) Stable state of decreased glide and increased rate of descent.
  - c) Stable state of increased glide and decreased rate of descent.
- 5. When does a dynamic stall occur?**
  - a) When the front risers are pulled down quickly.
  - b) At the end of a flare when the jumper begins to rock back under the canopy.
  - c) At the beginning of a flare.
- 6. What happens after a dynamic stall if the tail is held lower than the nose?**
  - a) Recovery.
  - b) Continued dynamic stall.
  - c) Full stall.
- 7. What is the best way to determine a canopy's optimum flare speed and depth for landing?**
  - a) Practice different rates of flare entry at different depths of flare.
  - b) Divide exit weight by the canopy's square footage.
  - c) Contact the manufacturer.
- 8. Describe your procedure for landing in high winds;**
  - a) Stay well downwind of any obstacle, face into the wind early, disconnect the RSL, land with a PLF, pull one toggle down completely, and after landing, cut away if necessary.
  - b) Do not attempt a stand-up landing; PLF
  - c) Enter downwind leg at 3/4 brakes and smoothly continue to full brakes.
- 9. How many A-lines does a nine-cell canopy have?**
  - a) Nine
  - b) Ten
  - c) Eleven



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- 10. To what part of the canopy do the steering lines (brake lines) connect?**
- a) Nose or leading edge
  - b) End cells
  - c) Tail or trailing edge
- 11. What lines go through the rear slider grommets?**
- a) A, B, and C
  - b) C, D, and brakes
  - c) A, C, and D
- 12. Where does the main pilot chute bridle attach to the canopy?**
- a) Rear center
  - b) Top center
  - c) Front center
- 13. Who may pack a main parachute?**
- a) FAA rigger, person jumping the parachute, person under rigger's supervision.
  - b) Drop zone certified packer, FAA rigger.
  - c) Anyone.
- 14. How often do the main and reserve parachute need to be packed?**
- a) Every 120 days
  - b) Every 180 days
  - c) Every 90 days
- 15. Who is in command of the aircraft?**
- a) FAA
  - b) TSA
  - c) Pilot
- 16. What are two purposes for wearing seat belts in an aircraft?**
- a) To conform to federal regulations; protection in a crash.
  - b) To prevent items from getting loose; to maintain the correct balance.
  - c) To maintain the correct balance; protection in a crash.
- 17. Who is responsible for determining if the aircraft is in condition for safe flight?**
- a) The aircraft owner.
  - b) The pilot.
  - c) FAA
- 18. Above what altitude MSL is the pilot of an unpressurized aircraft required to breathe supplemental oxygen?**
- a) 14,000 feet
  - b) 15,000 feet
  - c) 18,000 feet
- 19. Above what altitude MSL are all occupants of an unpressurized aircraft required to be provided with supplemental oxygen?**
- a) 14,000 feet
  - b) 15,000 feet
  - c) 18,000 feet



**20. In an aircraft with the exit door near the back, what must jumpers do to maintain the balance during exit procedures?**

- a) Remain forward until it is time for their group to exit.
- b) Follow the pilot's instructions on each jump.
- c) Remain as close to the pilot as possible.

**21. What is the biggest danger to a jumper when flying the canopy pattern?**

- a) Other canopies
- b) Turbulent wind
- c) Canopy malfunction

**22. What is the best way to avoid a canopy collision?**

- a) See and remain clear of other jumpers.
- b) Spiral quickly so that you are the first jumper landing.
- c) Stay in brakes so that you are the last jumper landing.

**23. How does the RSL work?**

- a) Activates a small explosion which cuts the reserve closing loop.
- b) Prevents main canopy from being cut away.
- c) Forms a separable link between the main riser and reserve ripcord so that cutting away the main activates the reserve, if the RSL is hooked up.

**24. What would happen if the main riser attached to the RSL breaks?**

- a) The reserve deploys into the main.
- b) The reserve deploys with the main still attached by the other riser.
- c) The main remains attached, creating a two-out situation.

**25. What is the best way to prevent risers from breaking?**

- a) Inspection and maintenance; correct packing, tight line stowage, and stable deployment.
- b) Replace risers every year.
- c) Remind your rigger to inspect at every reserve inspection and repack.

**26. What is one way to prevent a dual deployment?**

- a) Initiate malfunction procedures high enough to cut away safely and avoid AAD activation.
- b) Deploy the main parachute at or above the AAD activation altitude.
- c) De-activate AAD under canopy above AAD activation altitude.

**27. What is generally the best action to take in the following two-canopy-out (Biplane)?**

- a) Release the RSL (if time) and cut away.
- b) Release the brakes on the dominant canopy only and steer that canopy gently; or release the RSL (if time) and cut away; PLF.
- c) Release the brakes on the front canopy only and steer that canopy gently; PLF.

**28. What is generally the best action to take in the following two-canopy-out (Side by side)?**

- a) Release the RSL (if time) and cut away.
- b) Release the brakes on the dominant canopy only and steer that canopy gently; or release the RSL (if time) and cut away; PLF.
- c) Release the brakes on the front canopy only and steer that canopy gently; PLF.



**29. What is generally the best action to take in the following two-canopy-out (Downplane)?**

- a) Release the RSL (if time) and cut away.
- b) Release the brakes on the dominant canopy only and steer that canopy gently; or release the RSL (if time) and cut away; PLF.
- c) Release the brakes on the front canopy only and steer that canopy gently; PLF.



## Category E-1 Dive Flow

One AFF Instructor

### Freefall Dive Flow

- Assist instructor with spotting.
- Solo door (poised) exit.
- Altitude, arch, legs, relax.
- Barrel roll.
- Altitude, arch, legs, relax.
- Back flip.
- Altitude, arch, legs, relax.
- Continue aerobatics until 5,000 feet.
- Altitude, arch, legs, relax between each maneuver.
- Wave-off at 4,500 feet.
- Pull by 4,000 feet.

## Category E-2 Dive Flow

One AFF Instructor

### Freefall Dive Flow

- Assist instructor with spotting.
- Solo diving exit.
- Altitude, arch, legs, relax.
- Barrel roll.
- Altitude, arch, legs, relax.
- Front flip.
- Altitude, arch, legs, relax.
- Continue aerobatics until 5,000 feet.
- Altitude, arch, legs, relax between each maneuver.
- Wave-off at 4,500 feet.
- Pull by 4,000 feet.

### Canopy Dive Flow

- Correct common canopy problems.
- Release brakes, conduct control check and move to the holding area
- Check altitude, position, and traffic.
- Flare to chest at a medium speed and hold.
- Recover to full flight for ten seconds.
- Check altitude, position, and traffic.
- Flare to chest at a quicker speed and hold.
- Recover to full flight for ten seconds.
- Check altitude, position, and traffic.
- Flare to chest at a slower speed and hold.
- Recover to full flight for ten seconds.
- Check altitude, position, and traffic.
- Flare to hips at a medium speed and hold.
- Recover to full flight for ten seconds.
- Check altitude, position, and traffic.
- Flare to hips at a quicker speed and hold.
- Recover to full flight for ten seconds.
- Check altitude, position, and traffic.
- Flare to hips at a slower speed and hold.
- Recover to full flight for ten seconds.
- Check altitude, position, and traffic.
- Flare to shoulders at a medium speed and hold.
- Recover to full flight for ten seconds.
- Check altitude, position, and traffic.
- Flare to shoulders at a quicker speed and hold.
- Recover to full flight for ten seconds.
- Check altitude, position, and traffic.
- Flare to shoulders at a slower speed and hold.
- Recover to full flight for ten seconds.
- Evaluate the most effective flare according to the strongest sustainable lift ("sweet spot").
- Verify landing pattern and adjust as necessary.
- Steer over correct portion of flight path until 1,000 feet.
- Follow planned pattern over landing area or alternate.
- Prepare to PLF and Flare to land.



## **Advancement Criteria**

### **Spotting and Aircraft**

- Correct calculation of the opening point given simple wind conditions.
- Active participation with spotting procedures on jump run.

### **Exit and Freefall**

- Cumulative two successive disorienting maneuvers with stability and altitude awareness recovered within five seconds.
- Cumulative one barrel roll, one back loop, and one front loop.
- One self-supervised freefall.

### **Canopy**

- Unassisted landing within 50 meters.

### **Equipment**

- Complete open parachute system orientation.
- RSL orientation.

**Note:** Once these requirements have been met and you have received the endorsement of a USPA Instructor, your training may be supervised by any USPA Instructor. You may then self-supervise in freefall, but remain under USPA Instructor supervision. A USPA instructional rating holder should accompany you in the aircraft to verify the correct spot, clearance from clouds and aircraft, exit separation, and your position in the aircraft exit order.

