



# **Accelerated Freefall (AFF) Category B-H Training Aid**

**All training to be conducted by instructors of the:**





This Book Belongs To:

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# Warning

## Important Note:

Sport parachuting or skydiving is a potentially dangerous activity that can result in injury or death. **EACH INDIVIDUAL PARTICIPANT, REGARDLESS OF EXPERIENCE, HAS FINAL RESPONSIBILITY FOR HIS OR HER OWN SAFETY.**

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It is the responsibility of each student to ask whatever questions are necessary for him or her to have a thorough understanding of the actions and procedures that he or she must perform in order to make a safe skydive. Each skydiver has the responsibility to exercise certain practices and perform certain actions to maintain safety for himself or herself and for other people. **STARTSKYDIVING.COM LLC AND THE JUMP INSTITUTE MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, AS TO THE INFORMATION SET FORTH IN THIS MANUAL. ALL INDIVIDUALS RELYING ON THIS MATERIAL DO SO AT THEIR OWN RISK.**

An individual's safety can be enhanced by exercising proper precautions and procedures. This manual contains a subset of the knowledge and practices included in the UNITED PARACHUTE ASSOCIATION (USPA) 2009-2010 SKYDIVER INFORMATION MANUAL (SIM) and in the opinion of USPA, will promote the safe enjoyment of skydiving.

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## **In Memory Of Harry Short**



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## **Freefall Priorities**

1. Pull, Pull, Pull.
2. Pull at the proper altitude.
3. Pull at the proper altitude while stable.

## **Landing Priorities**

1. Land with your wing level and flying in a straight line.
2. Land in a clear and open area, avoiding obstacles.
3. Flare to at least half brakes.
4. Perform a parachute landing fall (PLF).

## **Other Good Advice**

Be altitude aware. It will save your life.

If you are unsure about something, ask an instructor.

Don't get discouraged. Take it one jump at a time.

Plan the dive, dive the plan and always have a backup.

Seek professional coaching when learning new skills whenever possible.

Know when to say NO. Use good judgment to avoid dangerous situations outside of your comfort/skill level (i.e. jumping in high winds, borrowing equipment, large formation jumps, free flying, CRW, high performance landings, etc., etc.).

Have fun. ☺



# Mental Relaxation:

## The Key to Body Flight

In the early Categories, you'll hear the following phrase over and over again from your instructors: "Altitude, arch, legs, relax." Managing all four points at once is the key to controlled freefall.

After altitude awareness, relaxing is your key goal. It takes only a little push from the hips to get an effective arch, and you usually need to extend your legs only a little to get use of them in the wind. But you need to relax your other muscles at the same time.

So how can a brand-new skydiver relax in such an adrenaline-charged, exciting, and new environment?

Sports psychologists all recognize the value of staying loose and mentally relaxed for peak performance. Many describe ways to achieve a state of prepared relaxation. Each athlete learns to develop one technique to achieve a relaxed state and maintain it during every performance.

Almost all the techniques begin with slower, deeper, controlled breathing. Learn to breathe from deep in your lungs, using the muscles of your diaphragm. Practice breathing in slowly until your lungs are full and then emptying your lungs completely when you breathe out.

While you practice controlled breathing, you can use one of several suggested devices to relax your mind and your body:

- Imagine yourself in a familiar, comfortable place, trying to visualize every sensual experience that you can associate with it: sight, sound, odor, taste, and touch. Picture the colors of the background and the details, try to smell the air as it would be, imagine you hear the sounds, and feel the air on your face. Imagine you just took a sip of your favorite drink.
- Relax your body part by part, starting with your toes, then your ankles, calves, thighs, hips, abdomen, etc., spending five to ten seconds in each place while continuing your controlled breathing.
- Count up to ten with each breath and then backward to zero.

There are many other relaxation techniques you can borrow or develop, but choose one and practice it until you perfect it, even when you're not skydiving. That way, you can relax yourself quickly and effectively whenever the need arises—such as just before a skydive.

You should continue controlling your breathing as you're getting ready to jump. Move slowly and deliberately in the aircraft as you approach the door and get into position, not only for safety but to help you maintain your relaxed, prepared state for the jump.

Take another breath just before you actually launch from the aircraft and again to help you settle into freefall as soon as you let go. Make breathing part of every sequence, especially as you go through your "altitude, arch, legs, relax" sequence.

While skydiving is inherently a high-speed sport, you'll notice that the best skydivers never do anything in a hurry.





## Category B

### One Jump

In Category B, you learn to be more comfortable in the skydiving environment. Training in this category reviews and expands your understanding of the canopy landing pattern and the airport environment, with attention to avoiding aircraft on or approaching the runways. You help with pre-flight planning and the use of the written flight plan, including opening point, the projected wind line and the landing pattern. Also, you learn to use the runway as a reference for direction and distance when observing the drop zone from the aircraft or under canopy. You also become more responsible for your equipment, particularly while moving around and inside the aircraft. Study topics introduce USPA Basic Safety Requirements (BSRs) for student jumps.

### **Learning and Performance Objectives**

- Relaxing in the skydiving environment
- Heading awareness
- Parachute deployment
- More on the landing patterns
- Written flight plan
- Airport orientation
- Protecting handles
- Equipment emergency review

### **Rules and Recommendations**

**Review the USPA Basic Safety Requirements (BSRs) on supervision and progression requirements for students.**

1. All student training programs must be conducted under the direction and oversight of an appropriately rated USPA Instructor until the student is issued a USPA A license.
2. A person conducting, training, or supervising student jumps must hold a USPA instructional rating according to the requirements that follow.
3. First jump course:
  - a. All first-jump non-method-specific training must be conducted by a USPA Instructor or a USPA Coach under the supervision of a USPA Instructor.
  - b. All method-specific training must be conducted by a USPA Instructor rated in the method for which the student is being trained.
4. All students must be trained in the following areas:
  - a. Equipment
  - b. Aircraft and exit procedures
  - c. Freefall procedures
  - d. Deployment procedures and parachute emergencies
  - e. Canopy flight procedures
  - f. Landing procedures and emergencies



5. Advancement criteria for AFF students:

- a. All students must jump with two USPA AFF rating holders until demonstrating the ability to reliably deploy in the belly-to-earth orientation at the correct altitude with assistance.
- b. All students must jump with one USPA AFF rating holder, exit safely, maintain stability, and deploy at the planned altitude without assistance prior to attempting disorienting maneuvers.
- c. All students must jump under the direct supervision of an appropriately rated USPA instructor until demonstrating stability and heading control prior to and within five seconds after initiating two intentional disorienting maneuvers involving a back-to-earth presentation.

6. Student training for group freefall (Coach or AFF):

- a. Student freefall training for group freefall jumps must be conducted by either a USPA Coach under the supervision of a USPA Instructor or USPA D license holders provided there is a minimum ratio of one D license holder to one student with a maximum of a 4-way.

7. No skydiver will simultaneously perform the duties of a USPA instructional rating holder and pilot-in-command of an aircraft in flight.

8. All student jumps must be completed between official sunrise and sunset.

## **Review the BSRs on wind limits for students**

1. For solo students, maximum ground winds are:

- a. 14 mph for ram-air-canopies
- b. 10 mph for round reserves

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

2. For licensed skydivers, there are no wind limitations.

## **Review the BSRs on minimum required deployment altitudes**

1. Minimum container opening altitudes above the ground for skydivers are:

- a. Tandem jumps: 4,500 feet AGL (Above Ground Level)
- b. All students and A-license holders: 3,000 feet AGL
- c. B-license holders: 2,500 feet AGL
- d. C and D-license holders: 2,000 feet AGL

## **Review the BSRs on drop zone requirements for students and what is considered a landing hazard**

1. Areas used for skydiving should be unobstructed, with the following minimum radial distances to the nearest hazard:

- a. Solo students and A-license holders: 100 meters
- b. B and C-license holders: 50 meters
- c. D-license holders: unlimited



2. Hazards are defined as telephone and power lines, towers, buildings, open bodies of water, highways, automobiles, and clusters of trees covering more than 3,000 square meters.
3. Manned ground-to-air communications (e.g., radios, panels, smoke, lights) are to be present on the drop zone during skydiving operations.

## **Equipment**

1. Parachute deployment with opportunities for malfunctions explained:
  - a. Lost or unrecoverable deployment handle
  - b. Impossible deployment handle extraction
  - c. Pack closure (closing sequence, bridal routing, pin orientation, etc.)
  - d. Pilot chute hesitation
  - e. Pilot chute in tow
  - f. Premature deployment (hand deploy)
  - g. Pilot chute entanglement.
  - h. Horseshoe
  - i. Bag lock
  - j. Streamer
  - k. Line-over
  - l. Fabric or line failure sufficient to interfere with control and flare.
  - m. Slider hang-up
  - n. Control-line entanglement
2. Review parachute retrieval after landing.

## **Spotting and Aircraft**

1. Minimum, careful movement in the aircraft helps prevent premature activation.
2. Winds are described by their direction of origin, said as a compass heading (for example, "The winds are two-seventy," means the winds are blowing from the west).
3. Runway lengths and headings (use of a compass):
  - a. The runway heading provides a reference for direction (north, south, east, and west).
  - b. The runway length provides a reference for judging distance from the air.

*Note: The Middletown Regional Airport runway is oriented 005°-230° (NE-SW) and is 6100 ft. in length.*

4. Avoid runways and approaches, including getting clear of a runway after landing on or near one.
5. Crossing the runway:
  - a. Know the airport and drop zone rules about crossing a runway.
  - b. If allowed, look both ways and minimize the time spent on the runway.



6. Discuss local aircraft traffic approach altitudes and landing patterns and their relationship canopy approach and landing patterns (see Illustration B.1).

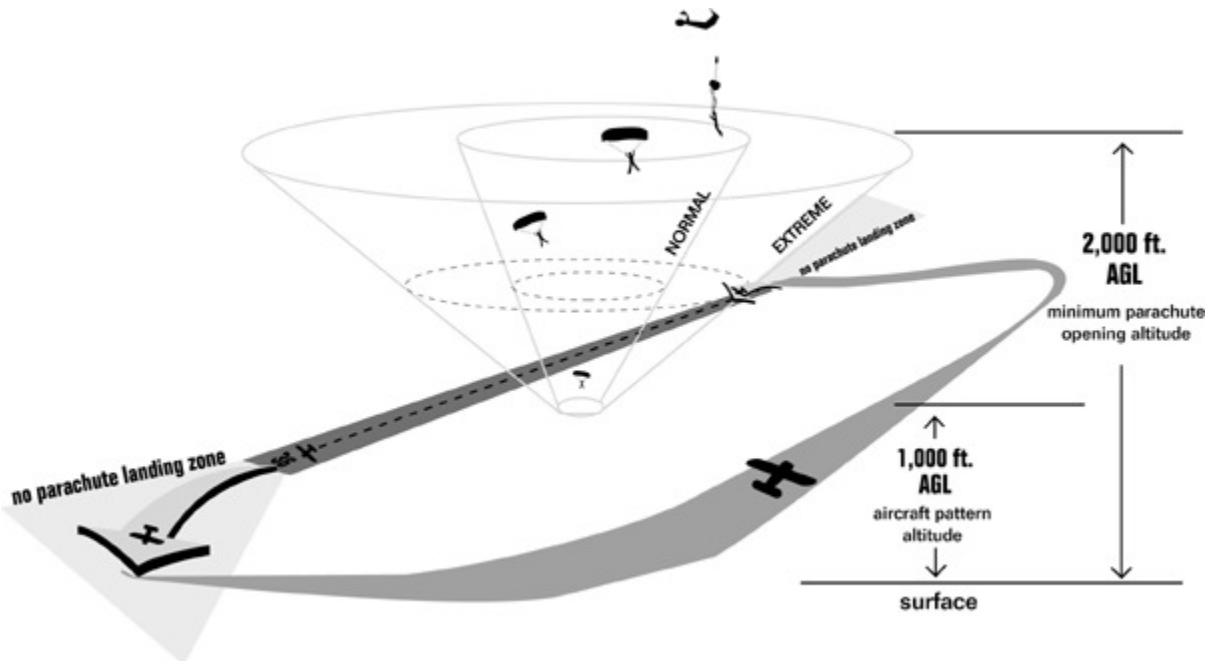


Illustration B.1 - Normal flight practices separate aircraft and parachutes at airports, but jumpers need to respect the runways and approaches.

## **Exit and Freefall**

1. Student-led exit (all students):
  - a. Review the exit set-up from Category A.
2. "Altitude, arch, legs, relax," Repeat to establish and maintain awareness, stability, and control:
  - a. Know your altitude.
  - b. Check your arch (hips forward a little).
  - c. Check your legs (most beginners need to extend their legs a little and point their toes).
  - d. Relax.
    - (1) Breathe consciously to release tension.
    - (2) Use this technique just before and after releasing from the aircraft.
3. Maintaining a heading:
  - a. First, relax into a comfortable neutral body position.
  - b. Find a point ahead on the horizon as a heading reference.
  - c. If turns are performed:
    - (1) Check the altitude.
    - (2) Turn head to the side and pick new heading 90° to current heading.
    - (3) Initiate turn by changing the level of your upper arms to deflect air to one side.
    - (5) Stop turn by returning to a neutral body position.
    - (4) Repeat in the opposite direction if time permits.



4. Altitude awareness to recognize and act at the assigned pull altitude is the most important task in freefall.
5. Leg awareness:
  - a. Practice leg awareness by extending legs while arms remain in a neutral position.
    - (1) Extending the legs from the neutral position adds more drag in the back, lifting your lower body.
    - (2) The off-level attitude causes you to slide forward on the deflected air.
    - (3) Hold the position for three seconds and return to neutral to cancel the effect.
    - (4) Finish all maneuvers 1,000 feet above wave-off altitude or 6,000 feet, whichever comes first.
6. Deployment:
  - a. Perform at least three practice touches or until comfortable with locating the deployment handle in freefall.
  - b. Wave-off to signal deployment.
  - c. Pull at the correct altitude without prompting from the instructor.

## **Emergency Procedure Review**

1. Deploy at the correct altitude, regardless of stability.
2. Review common problems in the training harness:
  - a. Correct response to line twist:
    - (1) Spread the risers and kick to untwist, but release the brakes only after clearing the twist.
    - (2) If spinning, twist the risers to untwist the lines and stabilize canopy, then kick to untwist the risers.
    - (3) By 2,500 feet, be sure line twist can be corrected at a safe altitude, or initiate emergency procedures.
  - b. The correct response to slider up:
    - (1) Bring both toggles to the bottom of the stroke to slow the canopy and pump at the bottom of the control range.
    - (2) Alternatively, pump the back risers.
    - (3) The slider needs to be at least halfway down for landing.
    - (4) Repeat remedial procedures twice or until reaching the decide-and-act altitude of 2,500 feet.
  - c. End-cell closure:
    - (1) Pull both toggles to the bottom of the stroke and hold them until the end cells open, then release them smoothly.
    - (2) Alternatively, hold down both back risers.
    - (3) If the end cells can't be cleared, evaluate controllability and flare before reaching the decide-and-act altitude of 2,500 feet.
  - d. If the canopy has opened normally but turns on its own, be sure both brakes are released.
  - e. Evaluate controllability and flare before reaching the decide-and-act altitude of 2,500 feet for:
    - (1) Broken steering line: Use back risers.
    - (2) Broken suspension line(s).
    - (3) Pilot chute entangles with canopy or lines.
    - (4) Damage: Canopy rips or tears.



3. Review deployment problems for manual activation:

- a. Make only two attempts to correct the problem before initiating reserve procedures.
- b. Lost deployment handle:
  - (1) Hip or chest handle location: Follow harness webbing for two seconds only.
  - (2) Bottom of container location: Sweep bottom of container, then side of container to corner for two seconds only.

*Note: StartSkydiving.com only uses bottom-of-container (BOC) main deployment handles.*

- c. Hard pull:
  - (1) Hip or chest handle location: Try again with two hands.
  - (2) Bottom of container: Place elbow against container for leverage.
- d. Pilot chute hesitation:
  - (1) Twist while looking over the right shoulder to modify the airflow.
  - (2) Repeat over the left shoulder.

4. Practice for deployment handle problems and pilot chute hesitation.

5. Review premature container opening in freefall for hand deployment:

- a. Attempt to locate and deploy the pilot chute first.
- b. If the pilot chute can't be located after two tries or if deploying the pilot chute results in a partial malfunction, cut away and deploy the reserve.

6. Practice for recognizing and responding to total and partial malfunctions (from Category A procedures).

7. Review minimum cutaway altitude and reserve deployment without cutaway if necessary:

- a. Decide to cut away by 2,500 feet and act.
- b. If below 1,000 feet without a functioning canopy, deploy the reserve. (Do NOT cutaway)
- c. If in a canopy entanglement with another jumper below 1,000 feet and it appears the canopies cannot be separated in time for a safe landing, deploy the reserve.
- d. Both parachutes deployed:
  - (1) Biplane--do not cutaway; steer the front canopy gently using toggles or leave the brakes stowed and steer by pulling on the rear risers; leave brakes stowed on the back canopy; PLF.
  - (2) Side-by-side--do not cutaway; steer the dominant (larger) canopy gently using toggles or leave the brakes stowed and steer by pulling on the rear risers; Leave the brakes stowed on the other canopy; PLF.
  - (3) Downplane--cutaway the main canopy, regardless of altitude.
- e. Premature deployment in aircraft:
  - (1) Attempt to contain the open parachute and inform the instructor.
  - (2) If your parachute goes out the door, follow it immediately, before being extracted.



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## Canopy

1. Using a DZ photo (Page 98) or taking a walk in the field, you'll preview with an instructor the expected opening point and prepare a written flight plan together.
  2. Review the descent strategy:
    - a. Determine position and altitude upon opening.
    - b. Locate the target and establish a line to the pre-planned 1,000-foot pattern entry point.
    - c. Divide the line logically according to the remaining altitude (halfway down, halfway back); for example, if open at 4,000 feet:
      - (1) Divide the line in thirds and fly over the first third of the line until 3,000 feet.
      - (2) Fly over the second third of the line until 2,000 feet.
      - (3) Fly over the remaining third of the line until reaching the pre-planned pattern entry point at 1,000 feet.
  3. Look first in the direction of a turn under canopy.
  4. Fly to the instructor-assigned pattern entry at 1,000 feet, as identified on the written flight plan.
  5. Fly the pre-planned pattern using downwind, base, and final approach legs, with specific points to fly over at specified altitudes.
  6. Fly a straight-in final approach without S-turns (S-turns present a hazard to other traffic).
  7. Flare at 10-12 feet, based on Category A experience.
- Note: Flaring is covered in more detail in Categories C and F.*
8. Review the PLF and its value to protect against a hard landing.



## Category B Quiz

(Must be passed before Category B jump)

**1. Who must directly supervise your student training jumps?**

- a) USPA Instructor rated for my discipline.
- b) The local Safety and Training Advisor.
- c) Drop zone owner/operator.

**2. What is your most important task when in freefall?**

- a) Correctly complete planned dive flow.
- b) Altitude awareness to recognize and act at the assigned pull altitude.
- c) Fall stable and on heading.

**3. What are the maximum winds in which any student may jump?**

- a) 15 mph
- b) 10-15 mph, depending on conditions and individual student ability.
- c) 10 mph for a round reserve canopy; 14 mph for a ram-air reserve, waivable by an S&TA.

**4. How would you clear a pilot chute hesitation?**

- a) Pull harder.
- b) Wait for the AAD to fire.
- c) Change body position to modify the air flow over my back.

**5. In the event of a canopy problem, students should decide and act about executing emergency procedures by what altitude?**

- a) 2,000 feet
- b) 2,500 feet
- c) 3,000 feet

**6. How would you address the following routine opening problem: Twisted lines?**

- a) Before releasing the brakes, spread risers or twist risers to transfer line twist to risers, kick in opposite direction, watch altitude to 2,500 feet.
- b) Cut away and deploy the reserve.
- c) Pump rear risers or steering controls at the bottom of the stroke while watching altitude to 2,500 feet.

**7. How would you address the following routine opening problem: Slider stops halfway down?**

- a) Pull toggles to flare position and hold (or pull down rear risers and hold) and watch altitude. If stubborn, determine controllability with turn and flare by 2,500 feet.
- b) Pump rear risers or steering controls at the bottom of the stroke while watching altitude to 2,500 feet.
- c) Cut away and deploy the reserve.

**8. How would you address the following routine opening problem: Closed end cells?**

- a) Make hard left and right turns in rapid succession to inflate each cell individually.
- b) Pump rear risers or steering controls at the bottom of the stroke while watching altitude to 2,500 feet.
- c) Pull toggles to flare position and hold (or pull down rear risers and hold) and watch altitude. If stubborn, determine controllability with turn and flare by 2,500 feet.





**9. How would you address the following routine opening problem: Broken lines or other damage?**

- a) Determine controllability and ability to flare by 2,500 feet.
- b) Cut away and deploy the reserve.
- c) Pump rear risers or steering controls at the bottom of the stroke while watching altitude to 2,500 feet.

**10. How would you address the following routine opening problem: Good canopy that is turning?**

- a) Be sure both brakes are released.
- b) Pump rear risers or steering controls at the bottom of the stroke while watching altitude to 2,500 feet.
- c) Cut away and deploy the reserve.

**11. What is the appropriate action if below 1,000 feet without a landable parachute?**

- a) Cut away and deploy the reserve.
- b) Do not cutaway, immediately deploy the reserve parachute.
- c) Wait for AAD to fire.

**12. If the pilot chute goes over the front of the canopy after it has opened, how can you tell if it's a malfunction?**

- a) If the canopy flares and turns correctly, it is probably safe to land.
- b) If the pilot chute is fully inflated, it is a malfunction.
- c) If the pilot chute is not fully inflated, it is a malfunction.

**13. What is the correct response to an open container in freefall using a hand-deployed system?**

- a) No more than two tries or two seconds to locate and deploy the main pilot chute; if no success, cut away and deploy the reserve.
- b) Cut away and deploy the reserve.
- c) Immediately deploy the reserve parachute, but not below 1,000 feet with an SOS system.

**14. If the pilot chute extracts the deployment bag from the parachute container (backpack) but the deployment bag fails to release the parachute canopy for inflation, what is the correct response?**

- a) Determine controllability and ability to flare by 2,500 feet.
- b) Do not cut away, immediately deploy the reserve parachute.
- c) Cut away and deploy the reserve.

**15. If part of the deployed parachute is caught on the jumper or the equipment (horseshoe), what is the correct response?**

- a) Immediately deploy the reserve parachute.
- b) Cut away and deploy the reserve.
- c) No more than two tries or two seconds to locate and deploy the main pilot chute; if no success, cut away and deploy the reserve.



**16. What are the three legs of the canopy landing pattern with relation to the wind direction**

- a) Downwind (with the wind), base (across the wind but downwind of the target), and final (with the wind).
- b) Downwind (with the wind), base (across the wind but downwind of the target), and final (into the wind)
- c) Downwind (against the wind), base (across the wind but upwind of the target), and final (into the wind).

**17. Why is it undesirable to land at the end of a runway?**

- a) Approaching and departing aircraft
- b) Turbulent winds
- c) FAA regulations



## Category B Dive Flow

Two AFF Instructors

### Freefall Dive Flow

- Exit in a relaxed arch.
- Circle of Awareness.
- 3 Practice deployments.
- Altitude, arch, legs, relax.
- Extend legs for three seconds and hold.
- Altitude, arch, legs, relax.
- Team turns.  
(L 90° turn, Altitude, R 90° turn, Altitude)
- Repeat as altitude permits.
- Lock on to Altimeter at 6,000 feet.
- Begin wave off at 5,500 feet.
- Pull by 4,500 feet.

### Canopy Dive Flow

- Correct common opening problems and release brakes.
- Look left, turn left. (At least 90°)
- Look right, turn right. (At least 90°)
- Flare.
- Check altitude, position, and traffic.
- Find landing area and pattern entry point.
- Divide flight path by thousands of feet.
- Look at runway and determine compass heading.
- 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

### **Freefall and Exit**

- Stability within ten seconds of exiting the aircraft.
- Maintain correct body position for stability throughout, including leg awareness and control.
- Initiate deployment procedures within 500 feet of the assigned altitude.

### **Canopy**

- Understanding and planning descent strategy from opening to pattern entry and pattern principles.
- Steering with clearance procedures without prompting (self-evaluated).
- Assisted flare for a safe landing within 30° of heading into the wind.

### **Equipment**

- Understanding routine canopy problems and the correct responses.



## Category C

### Two Jumps

By this time you have had the opportunity to learn controlled, stable fall by using the procedure, "altitude, arch, legs, relax." You will begin this category with two AFF Instructors but should jump with only one before advancing. You need to establish confidence and relaxed freefall control. A controlled freefall in Category C may include some random heading drift, which you learn to lessen by relaxing and focusing on the basics: altitude, arch, legs, and relax. The instructor shows you more about how to plan a canopy pattern for various wind speeds and directions to improve traffic flow and avoid conflicts with obstacles and other jumpers. You learn to predict, avoid, and react to turbulence induced by wind over obstacles and heated areas. You'll learn ways to approach an off-field landing, and your instructor explains how off-field landings may affect neighbor relations. You'll meet the FAA-rated parachute rigger, who packs and maintains the reserve parachute. He or she will familiarize you with the closed parachute system, and you'll observe the pre-flight equipment check. Emergency review includes discussion on an inadvertently opened parachute in and around the aircraft and how to avoid and respond to it. Also, your instructor provides more details on recognizing and avoiding landing obstacles and how to approach off-field landings.

### **Learning and Performance Objectives**

- Unassisted freefall with heading maintenance.
- Hover control.
- Solo deployment.
- Landing patterns for higher winds.
- Downwind landings.
- Wing loading.
- Accidental opening review.
- Turbulence.
- Landing off.
- Obstacle recognition.
- The FAA rigger.
- The closed parachute system.

### **Rules and Recommendations**

#### **Student gear requirements**

1. The BSRs list gear requirements for student jumps in SIM Section 2-1.K.2 through 5:
  - a. All students are to be equipped with the following equipment until they have obtained a USPA A license:
    - (1) A rigid helmet (except tandem students)
    - (2) A piggyback harness and container system that includes a single-point-riser release and a reserve static line, except:
      - i. A student who has been cleared for freefall self-supervision may jump without a reserve static line upon endorsement from his or her supervising instructor.
      - ii. Such endorsement may be for one jump or a series of jumps.
    - (3) A visually accessible altimeter.
    - (4) A functional automatic activation device that meets the manufacturers recommended service schedule.



- (5) A ram-air main canopy suitable for student use.
  - (6) A steerable reserve canopy appropriate to the student's weight.
  - (7) For freefall, a ripcord-activated, spring-loaded, pilot-chute-equipped main parachute or a bottom-of-container (BOC) throw-out pilot chute.
  - b. Students must receive additional ground instruction in emergency procedures and deployment-specific information before jumping any unfamiliar system.
  - c. For each harness-hold jump, each AFF rating holder supervising the jump must be equipped with a visually accessible altimeter.
  - d. All skydivers wearing a round main or reserve canopy and all solo students must wear flotation gear when the intended exit, opening, or landing point is within one mile of an open body of water (an open body of water is defined as one in which a skydiver could drown).
2. The FAA also regulates the training and certification of the FAA rigger, according to FAR 65.
  3. Some skydiving centers are subject to state and local rules or restrictions concerning landing off the DZ.
  4. The student should discuss with the drop-zone manager about how an off-field landing may affect the jumper and the DZ.

## **FAA regulations for the training and certification of the FAA rigger**

Senior parachute riggers must meet the following requirements:

1. Present evidence satisfactory to the administrator that he/she has packed at least 20 parachutes of each type for which he/she seeks a rating, in accordance with the manufacturer's instructions and under the supervision of a certificated parachute rigger holding a rating for that type or a person holding an appropriate military rating.
2. Pass a written test, with respect to parachutes in common use, on:
  - a. Their construction, packing, and maintenance.
  - b. The manufacturer's instructions.
  - c. The regulations of this subpart.
3. Pass an oral and practical test showing his/her ability to pack and maintain at least one type of parachute in common use, appropriate to the type rating he/she seeks.

Master parachute riggers must meet the following requirements:

1. Present evidence satisfactory to the administrator that he/she has had at least 3 years of experience as a senior parachute rigger and has satisfactorily packed at least 100 parachutes of each of two types in common use, in accordance with the manufacturer's instructions:
  - a. While a certificated and appropriately rated senior parachute rigger; or
  - b. While under the supervision of a certificated and appropriately rated parachute rigger or a person holding appropriate military ratings. An applicant may combine experience specified in paragraphs (1) (a) and (b) of this section to meet the requirements of this paragraph.



2. Pass a written test, with respect to parachutes in common use, on:
  - a. Their construction, packing, and maintenance.
  - b. The manufacturer's instructions.
  - c. The regulations of this subpart.
3. Pass an oral and practical test showing his ability to pack and maintain two types of parachutes in common use, appropriate to the type ratings he seeks.

## **Equipment**

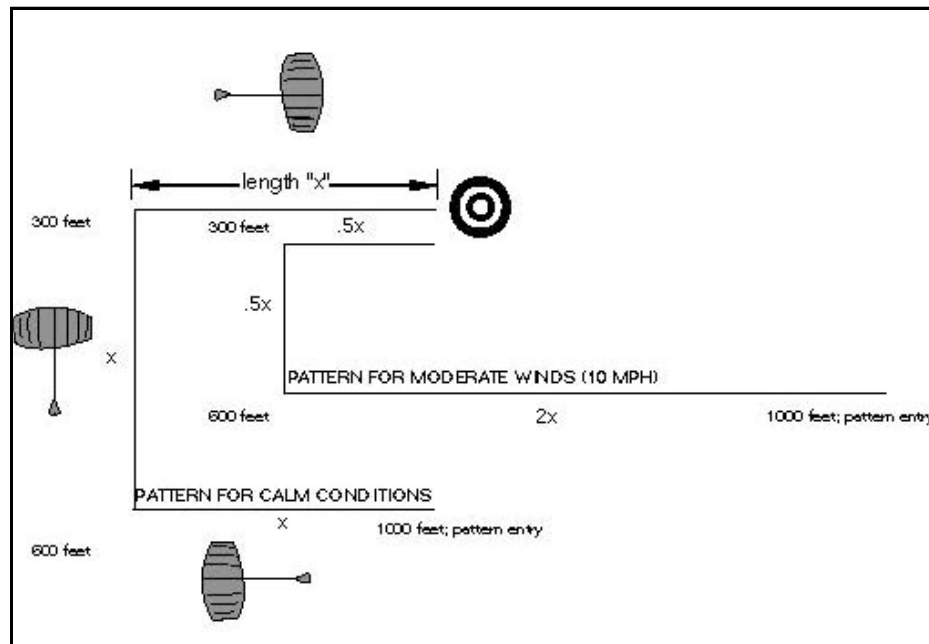
1. The automatic activation device (*Note: Detailed AAD operation is explained in Category D.*):
  - a. Activates the main or reserve parachute.
  - b. Is worn only as a back-up.
2. Observe the instructor performing the pre-flight check:
  - a. Top to bottom, (back):
    - (1) Reserve pin in place and straight.
    - (2) Reserve closing loop worn no more than 10%.
    - (3) Reserve ripcord cable movement in housing.
    - (4) Reserve packing data card and seal (especially on an unfamiliar or rental rig).
    - (5) AAD turned on and/or calibrated.
    - (6) Main activation cable or pin in place, free of nicks or kinks.
    - (7) Main closing loop worn no more than 10%.
    - (8) Pilot chute bridle routing or ripcord cable movement.
    - (9) Main activation handle in place.
  - b. Top to bottom, (front):
    - (1) Overview operation of three-ring release-pulling the cable releases the rings. (*Note: Pre-flight details for the three-ring release are covered in Category D. Disassembly and maintenance is explained in Category H.*)
    - (2) RSL connection, routing, and basic function to back up the jumper in pulling the reserve following a cutaway. (*Note: Comprehensive RSL operation is explained in Category E.*)
    - (3) Chest strap and hardware intact.
    - (4) Cutaway handle in position.
    - (5) Reserve handle in position.
    - (6) Leg straps and hardware operational and correctly threaded.

## **Spotting and Aircraft**

1. The landing pattern is square on a calm day, with each leg based on the canopy's projected glide distance from 300 feet of altitude (see Illustration C.1):
  - a. Each jumper must know his or her own canopy's glide distance from 300 feet in no wind to plan a pattern.
  - b. The instructor estimates the 300-foot no-wind glide distance for beginning students.
2. The planned final approach must be shortened from the known zero-wind square pattern as the wind increases; for example, cut the final approach approximately in half for ten mph.



3. The base leg also shortens as the wind increases; for example, also cut the base leg approximately in half for a ten-mph wind.
4. Plan the 1,000-foot pattern entry point farther upwind as winds increase; for example, double the length of the downwind leg used for calm conditions, ending at the new projected 600-foot point for ten-mph winds.



### Illustration C.1 - Adjusting the pattern for the day's conditions

## Exit and Freefall

1. Pull priorities:
  - a. Jumpers must deploy at the planned altitude, regardless of stability.
  - b. Priorities are in the following order of importance (top down):
    - (1) Pull, Pull, Pull.
    - (2) Pull at the proper altitude.
    - (3) Pull at the proper altitude while stable.
2. Review of smooth climb-out and exit:
  - a. Exact hand and foot placement.
  - b. Smooth launch to reduce momentum.
  - c. Correct presentation of hips and chest to the relative wind.
  - d. Legs out for a few seconds to add control.
3. Single-instructor exit 2nd AFF jump:
  - a. Revise the climb-out procedure for one instructor.
  - b. Prepare for slightly different results after launch with one instructor (typically more vertical).



4. Review of stability recovery and maintenance "altitude, arch, legs, relax":

- a. Know the altitude by reading the altimeter or counting from exit (depending on exit altitude).
- b. Arch at the hips to improve belly-to-wind stability.
- c. Check your leg position and adjust as needed (probably extend to 45 degrees).
- d. Relax by taking a breath and letting go of unwanted body tension.
- e. Recognize heading and correct as jump continues.

5. Alternate free-fall altitude references:

- a. Judge altitude by keeping track of time (average ten seconds for the first 1,000 feet, 5.5 seconds for every additional 1,000 feet).
- b. Look at the ground during the climb to altitude and cross check against the altimeter.
- c. Observe the cloud bases on the ride to altitude to use later as an altitude reference.
- d. Look at the ground after initiating deployment and while waiting for inflation; check what you observed against the altimeter after opening.

## **Emergency Procedure Review**

1. Open parachute in aircraft:

- a. Extreme care is required when leaning back against anything in aircraft.
- b. Importance of a pre-jump equipment check before leaving the aircraft.
- c. Importance of careful movement near or outside the door, especially with an AAD.
- d. If a parachute opens in the plane:
  - (1) If door is closed, secure the parachute and land with the plane.
  - (2) If the door is open, contain the parachute, close the door, and land with the plane.
  - (3) If the parachute goes out the door, so must the jumper.

2. Importance of deployment at the correct altitude, regardless of stability.

3. If an off-DZ landing is unavoidable:

- a. Look for an open, clear, accessible field.
- b. Decide on an alternate landing area by 2,000 feet.
- c. Fly a predictable landing pattern.
- d. Transpose the planned landing pattern from the intended field onto the alternate field.
- e. Land well clear of turbulence and obstacles.
- f. Prepare for a hard landing in any unfamiliar landing area.
- g. Be considerate of the property owner when leaving the landing area:
  - (1) Cross only at gates or reinforced areas.
  - (2) Leave all gates as they are found.
  - (3) Do not disturb cattle.
  - (4) Walk parallel to (between) any rows of crops until reaching the end of the field.
  - (5) Repair or replace any damaged property.





#### 4. Review of landing priorities:

- Land with the wing level and flying in a straight line.
- Land in a clear and open area, avoiding obstacles.
- Flare to at least the half-brake position.
- Perform a parachute landing fall.

#### 5. Collapse an inflated canopy on landing by pulling in one toggle and running toward it.

## Canopy

#### 1. Wing loading and canopy size:

- The wing-loading ratio is the jumper's exit weight (geared up) divided by the square footage of the canopy.
- The canopy manufacturer publishes wing loading or load recommendations for each model of canopy:
  - In the canopy owner's manual.
  - On the manufacturer's website.
- Canopy performance changes with wing loading:
  - With a heavier wing loading, expect:
    - Faster forward speed.
    - Faster descent rate.
    - Quicker turns.
    - Steeper and longer dive from a turn.
    - More violent malfunctions.
    - More skill to flare correctly.
  - With a lighter wing loading, expect:
    - Less drive against a strong wind.
    - Slower turns.
    - More forgiveness of landing errors.
    - Less predictable in turbulence.
- Use the example to calculate the wing loading for the canopy the student is about to jump (one of the Category C advancement criteria) (see Illustration C.2).

WING LOADING EXAMPLES	
jumper's exit weight: 215	
divided by canopy size (sq. ft.): 280	
wing loading: 0.77:1	
jumper's exit weight: 215	
divided by canopy size (sq. ft.): 195	
wing loading: 1.1:1	

Illustration C.2 - Examples of how to calculate wing loading.

- Canopies may appear easier to land with more weight, to a point:
  - A good landing in ideal conditions does not mean a smaller canopy is safe to jump in all conditions.
  - A more highly loaded canopy will stall at a higher airspeed.



f. With the same wing loading a smaller canopy of the same model will exhibit more lively performance characteristics:

- (1) Faster turns and turn response.
- (2) Quicker dynamic stall response.

2. Converting forward speed to lift:

- a. Flaring the canopy quickly to half brakes causes the canopy to slow down abruptly.
- b. Your momentum causes you to swing forward briefly, raising the front of the canopy and flattening the glide.
- c. Continue to flare, braking the canopy more and holding the high nose angle to maintain your lift while reducing the forward speed.
- d. Time your flare so your feet touch the ground before you begin to swing back under the canopy (dynamic stall) or begin to fly backwards (full stall) (see Illustration C.3).

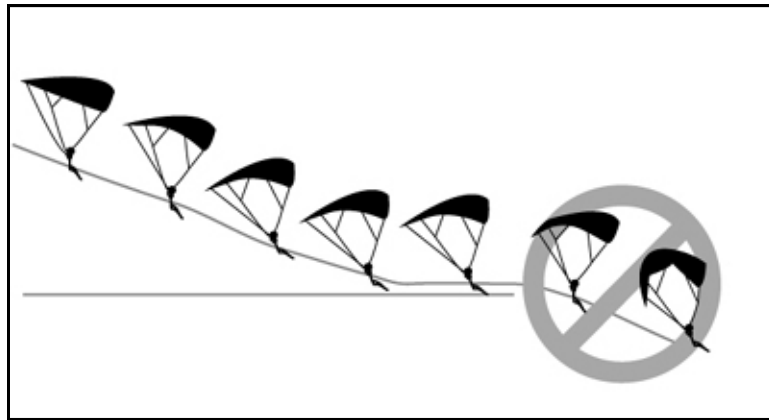


Illustration C.3 - When flared perfectly, the canopy lets the jumper down just prior to the stall.

3. Turbulence sometimes occurs in the landing area:

- a. Anticipate turbulence 10-20 times the height of an obstacle on the downwind side.
- b. The effects and likelihood of turbulence increase with wind speed.
- c. Turbulence often occurs (see Illustration C.4 & C.5):
  - (1) Near runways.
  - (2) Alongside roads.
  - (3) Where two areas of different colors or textures meet.
  - (4) Behind other canopies (wake turbulence).
  - (5) Over irregular terrain.
  - (6) Downwind of the propeller wash of a taxiing aircraft.

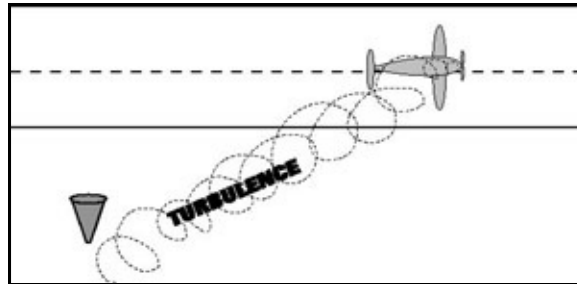


Illustration C.4 - Airplane propellers create turbulence.

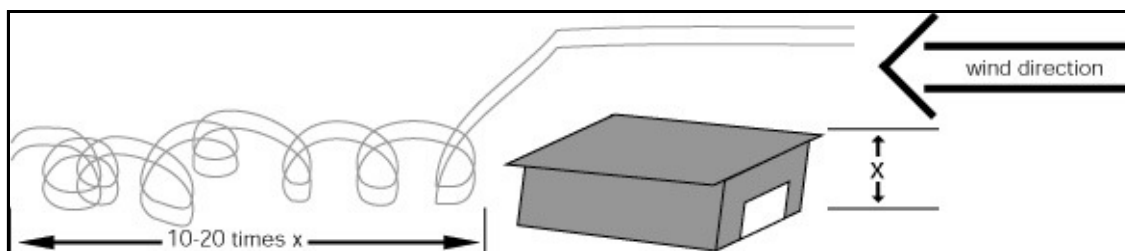


Illustration C.5 - Turbulence occurs downwind of an obstacle at 10 to 20 times its height, depending on the strength of the wind.

4. When flying in turbulence:

- Maintain the desired heading using smooth but effective toggle input.
- Fly full speed or as directed in canopy owner's manual.
- Prepare for a hard landing.

5. Recognition of a clear field:

- Power lines run along roads and between buildings, as well as randomly in open fields.
- A row of vegetation often hides a fence.
- Rocks, hills, and other terrain irregularities often remain invisible until just prior to touchdown.
- Inspect an unfamiliar landing area more closely at every 500-foot interval during descent and continuously below 500 feet.

6. Planning a landing pattern (intended landing area or alternate) for smooth flow and separation of traffic (see Illustration C.6):

- Jumpers on left-hand (left-turning) approaches should land on the left side of the landing area; jumpers on right-hand approaches should land on the right side of the landing area to prevent conflicts.
- The turn from base leg to final is the most hazardous because of opposite approaching traffic
- Look and avoid.



7. Downwind landings are better than low turns:

- On calm days, unexpected wind shifts sometimes require jumpers to land with a light wind, instead of against it.
- On windy days, jumpers sometimes fly downwind too long and run out of time to complete a turn into the wind, also requiring them to land with the wind.
- When faced with deciding between a low turn or a downwind landing, the downwind landing is the correct decision.
- When making a downwind landing:
  - Flare at the normal altitude, regardless of ground speed.
  - Roll on landing, using the PLF hard-landing procedure.
  - Tripping when trying to run out a high-speed landing can result in serious neck injury or death.

8. When to attempt a stand-up landing:

- When you're in control of all the variables.
- After a good flare at the appropriate altitude.

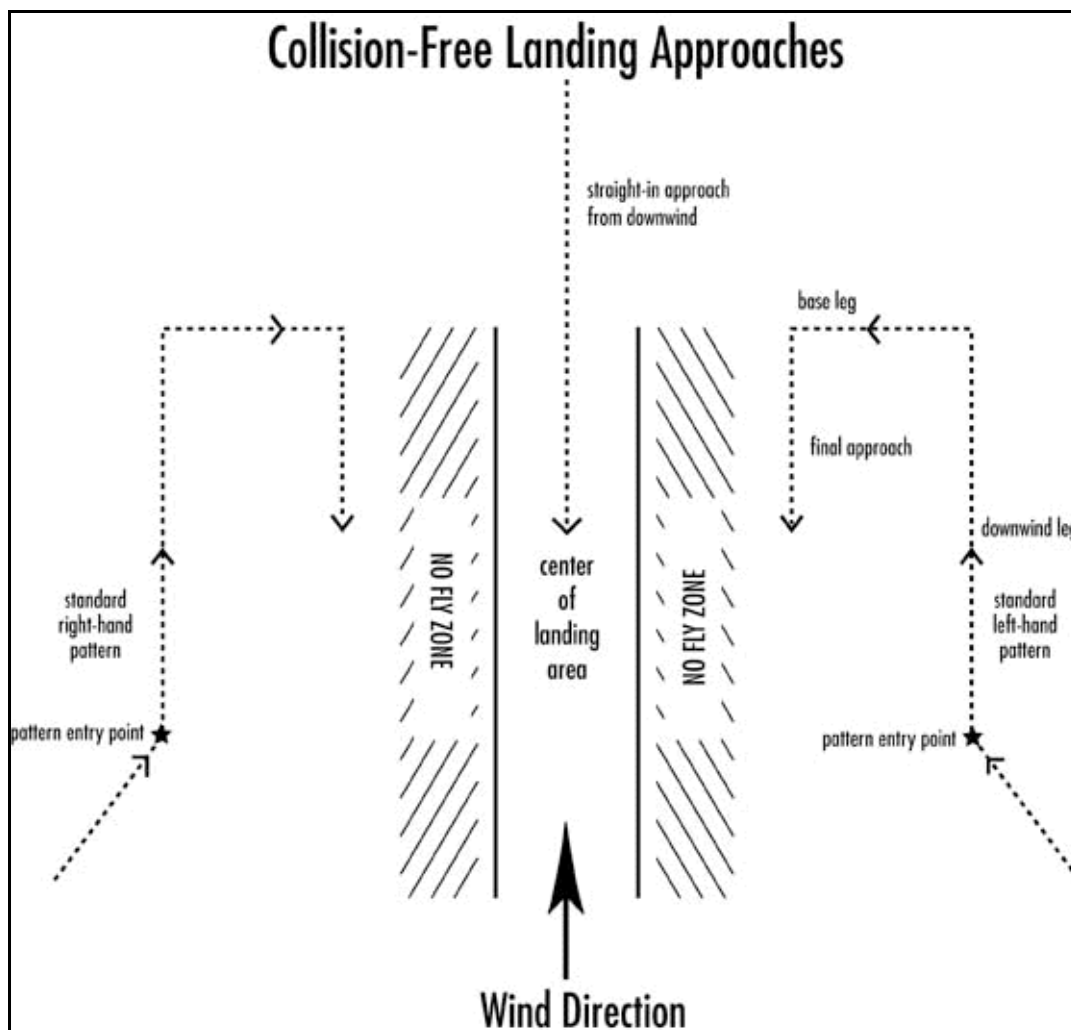


Illustration C.6 - Jumpers flying a right-hand pattern should land on the right side of the field; jumpers flying a left-hand pattern should land on the left side of the field.



## Category C Quiz

(Must be passed before Category C jump)

- 1. In flat and stable free-fall at terminal velocity, how long does it take an average jumper to fall 1,000 feet?**
  - a) 4.5 seconds
  - b) 5.5 seconds
  - c) 6.0 seconds
- 2. What is the correct procedure for recovering from instability to the belly-to-earth position?**
  - a) Be more aggressive in your body position.
  - b) Altitude, arch, legs, relax.
  - c) De-arch, relax.
- 3. Which is better, to pull at the planned altitude or to fall lower to get stable before pulling?**
  - a) Always be stable before pulling.
  - b) Pull above the planned altitude if you know you will not be stable.
  - c) Pull at the planned altitude, regardless of stability.
- 4. What is the purpose of the wave-off before deployment?**
  - a) To signal other jumpers.
  - b) To get stable before pulling.
  - c) To relax in preparation for deployment.
- 5. What is the purpose of the parachute landing fall (PLF), and why is it important for skydivers?**
  - a) PLF allows skydivers to land in any location safely
  - b) It protects against hard landings, and all skydivers have hard landings.
  - c) It helps protect your gear.
- 6. What part of the landing pattern is most dangerous to skydivers?**
  - a) The intersection of the base and final approach legs.
  - b) The last 20 feet of the landing leg.
  - c) Entry into the downwind leg.
- 7. How do higher wind speeds affect the planned landing pattern as compared to the pattern plan for a calm day?**
  - a) Lengthens the final approach, shortens the base leg, lengthens the downwind leg, and places the planned pattern entry point farther upwind.
  - b) Shortens the final approach, shortens the base leg, lengthens the downwind leg, and places the planned pattern entry point farther upwind.
  - c) Shortens the final approach, lengthens the base leg, lengthens the downwind leg, and places the planned pattern entry point farther downwind.
- 8. In moderately strong winds, how far downwind of an obstacle would you expect to find turbulence?**
  - a) 1-3 times the height of the obstacle.
  - b) 5-10 times the height of the obstacle.
  - c) 10-20 times the height of the obstacle.



**9. What is the best procedure to use when flying your canopy in turbulent conditions?**

- a) Fly your canopy at half-brakes.
- b) Keep the canopy flying in a straight line at full flight (or as directed by the owner's manual).
- c) Fly in a zig-zag pattern at full flight (or as directed by the owner's manual).

**10. Why is it important to protect your parachute system operation handles when in and around the aircraft?**

- a) Keeps them in place and prevents accidental or premature deployment.
- b) Protects them from corrosive aircraft exhaust.
- c) Reinforces muscle memory of handle locations.

**11. What is the equipment pre-flight strategy to use before putting on your gear?**

- a) Metal parts first, fabric second, plastic third.
- b) Top to bottom, back to front.
- c) Manifest check, instructor check, pilot check.

**12. How does the three-ring main canopy release system disconnect the main parachute from the harness?**

- a) Cuts the risers.
- b) Pulls the cables to release the cloth loop.
- c) Pulls the cables to release the reserve closing pin.

**13. How do you know if a reserve parachute has been packed by an FAA rigger within the last 180 days?**

- a) Rigger's packing seal on the reserve ripcord.
- b) Information found on the reserve packing data card.
- c) Drop zone administrative records.

**14. How do you know the reserve container has not been opened since the FAA rigger last closed it?**

- a) Rigger's packing seal on the reserve ripcord.
- b) Information found on the reserve packing data card.
- c) Drop zone administrative records.

**15. If the surface winds are blowing from west to east, which direction will you face to fly the downwind leg of the landing pattern instructor's illustration?**

- a) West
- b) East
- c) North

**16. How is wing loading calculated?**

- a) Divide the exit weight by the square footage.
- b) Divide the square footage by the exit weight.
- c) Divide the jumper's weight by the square footage.

**17. Which canopy size (same model design) will exhibit quicker control response?**

- a) 210-square feet with a 210-pound jumper (geared up).
- b) 190-square feet with a 190-pound jumper (geared up).
- c) 170 square feet with a 170-pound jumper (geared up).



**18. When is it OK to attempt a stand-up landing?**

- a) When the winds are between 5-10 mph.
- b) When the jumper has control of all the variables and has executed a good flare at the appropriate altitude.
- c) When the parachute is open, square, steerable and able to be landed.



## Category C-1 Dive Flow

Two AFF Instructors

### Freefall Dive Flow

- Assist instructors with spotting.
- Exit in a relaxed arch.
- Circle of Awareness.
- 1 Practice deployment without assistance.
- Circle of Awareness.
- 2 Toe taps.
- Instructors release grips as situation allows.
- Altitude, Arch, Legs, Relax
- Short Circle of Awareness every 3-5 seconds. (Heading & Altitude)
- Lock on to Altimeter at 6,000 feet.
- Begin wave-off at 5,500 feet
- Deploy by 4,000 feet.

### Canopy Dive Flow

- Correct common opening problems and release brakes.
- Look left, turn left. (At least 90°)
- Look right, turn right. (At least 90°)
- Flare.
- Check altitude, position, and traffic.
- Find the landing area and pattern entry point.
- Divide the flight path by thousands of feet.
- Identify suspect areas of turbulence.
- 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.

## Category C-2 Dive Flow

One AFF Instructor

### Freefall Dive Flow

- Assist instructor with spotting.
- Exit in a relaxed arch.
- Circle of Awareness.
- 1 Practice deployment without assistance.
- Circle of Awareness.
- 2 Toe taps.
- Instructor releases grips as situation allows.
- Altitude, Arch, Legs, Relax
- Short Circle of Awareness every 3-5 seconds. (Heading & Altitude)
- Lock on to altimeter by 6,000 feet.
- Begin wave-off at 5,500 feet
- Deploy by 4,000 feet.

### Canopy Dive Flow

- Correct common opening problems and release brakes.
- Look left, turn left. (At least 90°)
- Look right, turn right. (At least 90°)
- Flare.
- Check altitude, position, and traffic.
- Find the landing area and pattern entry point.
- Divide the flight path by thousands of feet.
- Identify suspect areas of turbulence.
- 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**

### **Exit and Freefall**

- Demonstrate the ability to freefall safely with one AFF Instructor.
- Stable deployment without AFF Instructor contact.
- Control within five seconds of exit.
- Stable, relaxed freefall.
- Ability to dampen turns and heading drift using "altitude, arch, legs, relax".
- Wave-off and pull at the assigned altitude.

### **Canopy**

- Fly a recognizable pattern with minimal assistance.
- Flare with minimal assistance.

### **Spotting and Aircraft**

- Understanding of how to plan and adjust the landing pattern for wind speed and direction.

## **HAVE YOU JOINED USPA?**

The United States Parachute Association represents and works for skydivers like you. USPA maintains FAA-recognized skydiving training, licensing, and rating programs, sanctions competitions and much more.

As a USPA member, you receive third-party personal liability and property damage skydiving insurance coverage.

Maintaining a strong association of skydivers requires your participation. Please join at your local drop zone, on line at [www.uspa.org](http://www.uspa.org), or call (540) 604-9740.



# Visualization:

## Mind Over Body

Did you know that done properly, visualizing what you're about to do can be as effective as practicing it for real? Studies show that the only part of an athlete's performance that visualization won't help is gaining the strength necessary to perform the task.

Exercise is hard and skydiving is expensive, but visualization is cheap and easy. To begin, go where you can relax and where distractions won't affect you. (Potential distractions may be all around, but you can train your mind to tune them out.) Breathe rhythmically, slowly and recall or imagine a pleasant experience or moment where you are calm and very comfortable.

Then, imagine your upcoming performance exactly as you want it to occur. Start from the beginning, which includes moving to the door of the aircraft and imagine your actions through to the end. You should even visualize your descent under canopy.

Visualize every detail: where you will place your hands and feet in the door, the cold air rushing in, the noise of the plane, the clean smell of the air, the feel of the aircraft metal on your hands, and everything you can associate with the upcoming experience.

Imagine how you will move every part of your body during the count and exit and how you will feel as you fly away from the plane. Think of where you will position your hands, feet, head, and torso, particularly as you explore techniques for maneuvering in freefall. Visualize every move, including looking at the ground, checking your altimeter, and seeing your instructors.

Some athletes visualize the upcoming performance from their point of view, while others visualize as if they were watching themselves on TV from above or alongside.

Visualize in slow motion or real time, but no faster. See your performance as one continuous flowing action, rather than as snapshots. As you visualize your actions, associate the motions by feigning the small movements with your hands or your legs with each action ("twitch") as you mentally rehearse the performance.

Leave yourself a few minutes to take in the sights and sounds on the way to altitude, but keep your performance first on your mind. The jumpers who succeed best all practice their routines on the climb to altitude, so you shouldn't feel out of place. Just look around at the others doing the same thing!

At this stage of your training, your performance requires as much of your attention as any skydiver training for competition. Use these same visualization tips that help top athletes in skydiving and other sports to help you improve your performance and increase your overall satisfaction from each jump.

## Category D

### Two Jumps

By now, you have learned to safely control freefall by keeping track of your altitude, focusing on a neutral body position-especially your hips and legs and relaxing. In Category D, you'll learn to control heading by modifying the neutral position using your upper body to deflect air. You will need to demonstrate relatively effortless control of 90°, 180°, and 360° freefall turns before moving on to aerobatics, introduced in Category E.

Under canopy, you will explore rear riser control, which opens new safety options and adds fun to the canopy ride. Before advancing, you should demonstrate the ability to return to the drop zone and steer a planned, recognizable landing pattern without assistance. To progress to Category E, you should also by now be able to flare and land with minimal assistance. Each student should be able to stand up on landing by the end of this category.

In Category C, you observed your instructor prepare and inspect your gear for the jump. Now, it's your turn. In Category D, you'll begin studying skydiving equipment in earnest to become responsible for your own pre-flight equipment checks. You'll review the owner's manual for the automatic activation device and learn how to operate one.

The USPA Instructor introduces some of the elements of spotting, which means choosing the correct exit point and guiding the pilot to it. You'll observe jump-run operations from the door. Study assignments include the FAA requirements for cloud clearance and visibility, which you'll need to memorize.

### **Learning and Performance Objectives**

- Solo, unassisted exit (AFF students).
- Freefall turns.
- Freefall speeds and times (review).
- Rear riser control.
- Building landing review.
- AAD (owner's manual).
- Pre-jump equipment check.
- Introduction to three-ring release operation.
- Cloud clearance and visibility.
- Observe jump run.

### **Rules and Recommendations**

#### **Cloud clearance and visibility requirements for skydivers (FAR 105.17)**

1. The pilot and jumper are jointly responsible for complying with the flight visibility and cloud clearance requirements of FAR Section 105.29. Aircraft flight under visual flight rules (VFR) conditions and persons making parachute jumps require minimum clearance from clouds and minimum visibility depending upon the altitude at which the activity is taking place:
  - a. For activities which are at or above 10,000 feet MSL, the required minimum distance from clouds is 1,000 feet under, 1,000 feet over, and 1 mile horizontally from clouds. Flight visibility must be at least 5 miles.
  - b. For activities which are at more than 1,200 feet above the surface but less than 10,000 feet MSL, the required minimum distance from clouds is 500 feet under, 1,000 feet over, and 2,000 feet horizontally from clouds. Flight visibility must be at least 3 miles.



**Note: No person may make a parachute jump into or through a cloud.**

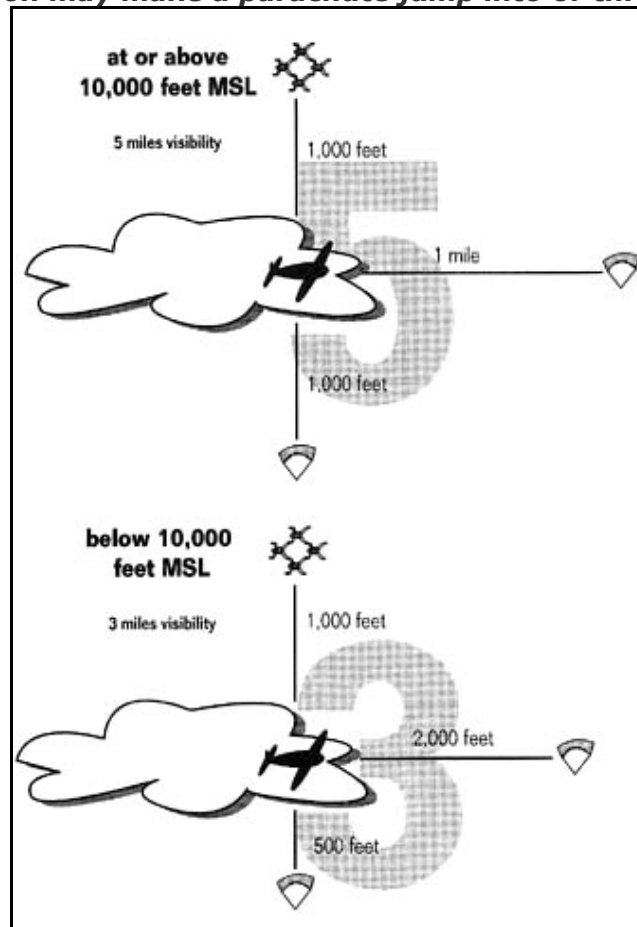


Illustration D.1 - Jumpers must observe the FAA requirements for visibility and clearance from clouds to avoid other aircraft flying over the drop zone.

## **Equipment**

### 1. Automatic activation device operation:

- The instructor or a rigger explains the basics of how to operate the AAD.
- More AAD information is contained in the owner's manual, which every jumper should read.

### 2. Three ring system:

- Each ring passes through only one other ring.
- The white retaining loop passes through only the topmost, smallest ring.
- The white retaining loop passes through the cable housing terminal end.
- The release cable passes through the white retaining loop.
- The retaining loop is undamaged.
- The release cable is free of nicks, kinks, and burrs (especially on the end).



### 3. Pre-jump equipment checks:

- a. Before each jump, check your equipment before putting it on.
- b. With the help of another jumper, get a complete equipment check with all your gear on before boarding.
- c. Get your equipment checked once again before exiting the aircraft:
  - (1) "Check of threes" (jumper self-check).
    - i. Three-ring assembly (and reserve static line).
    - ii. Three points of harness attachment for correct routing, assembly and adjustment.
    - iii. Three operation handles--main activation, cutaway and reserve.
  - (2) Pin check back of system (by another jumper) top to bottom:
    - i. Reserve pin in place (and automatic activation device on and set).
    - ii. Main pin in place.
    - iii. Ripcord cable movement or correct bridle routing.
    - iv. Activation handle in place.
  - (3) Personal equipment check ("SHAGG"):
    - i. Shoes-tied, no hooks.
    - ii. Helmet-fit and adjustment.
    - iii. Altimeter-set for zero.
    - iv. Goggles-tight and clean.
    - v. Gloves-lightweight and proper size.

### 4. Jumpsuit or clothes:

- a. Access to handles-shirt tails, jackets, and sweatshirts tucked in, pockets zipped closed.
- b. Protection on landing.
- c. Provide correct fall rate.

*Note: Your instructor will guide you through a complete pre-flight equipment check.*

## **Introduction to Spotting**

1. Instructor-assisted planning with the landing pattern for the day's conditions.
2. Overview of aircraft spotting and jump-run procedures (what "spotting" means):
  - a. Determining the best opening point:
    - (1) Calculations from wind forecasts.
    - (2) Observation and discussion of previous jumpers' canopy descents.
  - b. Pre-flight briefing with the pilot to discuss the correct jump run and exit points.
  - c. Guiding the pilot on jump run.
  - d. Verifying that the area below is clear of clouds and other aircraft before jumping.
3. During jump run, observe spotting procedures and demonstrate the technique for looking straight down from the aircraft:
  - a. Sight from the horizon looking forward.
  - b. Sight from the horizon looking abreast.
  - c. The junction of the two perpendicular lines from the horizon marks the point straight below the aircraft.





4. You must get your head completely outside the aircraft to effectively look below for other aircraft and clouds.

## **Exit and Freefall**

1. Poised or standard AFF exit:
  - a. Use the same climb out, set-up, launch, and flyaway procedure as on previous exits.
  - b. Prepare for slightly different results without an instructor gripping the harness on exit.
  - c. Altitude, arch, legs, relax.
  - d. Exit without assistance and establish control within five seconds before advancing from Category D.
2. Initiating freefall turns:
  - a. First establish a comfortable, relaxed, neutral body position.
  - b. Find a point ahead on the horizon as a primary heading reference.
  - c. Initiate a turn by changing the level of your upper arms to deflect air to one side; the forearms should follow.
  - d. Assist the turn's effectiveness by extending both legs slightly to counter the effects of tension in the upper body.
  - e. Any deviation from the neutral position (as when initiating a turn) demands more effort to maintain the rest of the body in neutral.
  - f. Maintain leg pressure and arch for a smooth turn.
  - g. Stop small turns (90 degrees or less) by returning to the neutral body position.
  - h. Stop larger turns (180 and 360 degrees) using the "start-coast-stop" principle.
    - (1) Start the turn using the turn position for the first half of turn.
    - (2) Return to neutral when original heading comes into view.
    - (3) Counter the turn if necessary to stop on heading.
  - i. To regain lost control: altitude, arch, legs, relax (neutral position), then pick a new heading to maintain.
  - j. Stop all maneuvers at 6,000 feet and maintain a stable arch on heading with positive leg pressure through wave-off and deployment.
3. Calculating freefall time according to exit altitude based on average terminal velocity of 120 mph:
  - a. Ten seconds for the first 1,000 feet.
  - b. 5.5 seconds for each additional thousand feet (round down to five seconds for an added safety margin).
  - c. Example: jump from 5,000 feet with a planned deployment altitude of 3,000 feet-
    - (1) Allow ten seconds from 5,000 to 4,000 feet.
    - (2) Add five seconds from 4,000 to 3,000 feet
    - (3) Plan a total of 15 seconds for freefall.



## **Emergency Procedure Review**

1. Training harness review:
  - a. Recognition and decision-making ability for good or bad canopy:
    - (1) Review sample problems not requiring a cutaway and practice the procedures.
    - (2) Review premature deployment.
    - (3) Review sample malfunctions requiring a cutaway and practice the procedures.
  - b. Procedures for testing a questionable canopy above cutaway altitude:
    - (1) Make two tries to clear the problem with toggles or back risers if altitude permits.
    - (2) The canopy must fly straight, turn, and flare reliably to be able to land safely.
    - (3) Decide to cut away or land the canopy by 2,500 feet and act.
2. Procedures for landing on a building.
  - (1) If possible, disconnect the RSL before landing on a building.
  - (2) Feet and knees together, prepare to PLF and absorb impact.
  - (3) Flare to at least half brakes.
  - (4) After landing, cutaway main canopy to avoid being pulled off of roof, wait for assistance.

## **Canopy**

1. Rear riser steering:
  - a. Steer using the rear risers with the brakes still set to change heading quickly after opening:
    - (1) With the brakes set, the canopy has less forward momentum to overcome for a turn.
    - (2) The rear risers operate more than the entire back quarter of canopy.
  - b. Using risers to steer in case of a malfunctioned toggle (discussion):
    - (1) Release both brakes.
    - (2) You need to conserve enough strength to complete all turns with rear risers until landing and still be able to flare.
    - (3) Especially on a smaller canopy, you should practice riser flares many times above 1,000 feet on a routine jump before committing to a riser landing (important).
    - (4) Your plan to land or cut away in the event of a malfunctioned toggle should be made before you ever encounter the problem.
    - (5) One locked brake with the other released may necessitate a cutaway; decide and act by 2,500 feet.
  - c. Practice all riser maneuvers above 1,000 feet and focus on the canopy pattern and traffic from 1,000 feet down.
  - d. Before making any turns, look in the direction of the turn to prevent collisions and entanglements.
2. With minimal assistance, land within 50 meters of the target.



## Category D Quiz

(Must be passed before Category D jump)

**1) For planned deployment initiation at 3,000 feet, approximately how long should an average-sized jumper fall after exiting at 5,000 feet?**

- a) 10 seconds
- b) 15 seconds
- c) 20 seconds

**2) What is the most appropriate response to loss of heading control in freefall?**

- a) Altitude, arch, legs, relax.
- b) Correct by turning in opposite direction.
- c) De-arch.

**3) What is the best way to avoid a canopy collision when turning?**

- a) Announce in a loud, clear voice your upcoming turns and/or maneuvers.
- b) Always fly a right-hand pattern.
- c) Look first in the direction of the turn.

**4) What is the quickest and safest way to change heading immediately after opening?**

- a) Aggressively use toggle inputs to turn.
- b) Rear riser turn with the brakes still set.
- c) Front riser turn with the brakes still set.

**5) How would you steer a parachute that has a broken brake line?**

- a) Immediately cut away and pull the reserve.
- b) Use the back risers to steer with the brakes still set.
- c) If familiar with rear-riser flares on that canopy, release both brakes and use the back risers to steer.

**6) How would you prepare to land a canopy using the rear risers to flare?**

- a) Practice with rear-riser flares at altitude with that canopy during a routine jump.
- b) Prepare to PLF.
- c) Set the brakes first, then land using rear risers.

**7) What is the procedure for landing on a building?**

- a) Cut away 5-10 feet above the building surface, prepare to PLF.
- b) Disconnect the RSL (if time), contact the building feet first, PLF, cut away after landing on top of a building, wait for competent help.
- c) Steer away from building so that you land on solid ground.

**8) What is the purpose of the automatic activation device?**

- a) To back up the jumper's emergency procedures.
- b) To deploy the main canopy if the jumper is unable.
- c) To give the jumper more useable freefall time.





**9) What is the "check of threes"?**

- a) Check with manifest to confirm your load number; check with your instructor to go over the dive flow; check with the pilot to confirm load.
- b) Check three-ring release system for correct assembly and RSL; three points of harness attachment for correct routing, assembly and adjustment; three operation handles-main activation, cutaway, reserve.
- c) Altitude, arch, legs.

**10) What must the spotter do to determine what is directly underneath the aircraft while on jump run?**

- a) Maintain communication with flight control.
- b) Check GPS spot.
- c) Place head completely outside the aircraft and look straight down.

**11) How far horizontally must jumpers be from any cloud below 10,000 feet MSL?**

- a) 2,000 feet
- b) 3,000 feet
- c) one mile

**12) How far horizontally must jumpers be from any cloud at 10,000 feet MSL and above?**

- a) 2,000 feet
- b) 3,000 feet
- c) one mile

**13) What are the minimum visibility requirements below 10,000 feet MSL?**

- a) one mile
- b) three miles
- c) five miles

**14) What are the minimum visibility requirements at 10,000 feet MSL and above?**

- a) one mile
- b) three miles
- c) five miles

**15) Who is responsible for a jumper observing cloud clearance requirements?**

- a) Jumper and pilot.
- b) Each jumper.
- c) Safety and Training Advisor.

**16) According to the BSRs, what is the latest a student may jump?**

- a) 9:00 PM (2100)
- b) All student jumps must be completed by sunset.
- c) All student jumps must be completed by thirty minutes after sunset.

**17) What is the technique for determining the point straight below the aircraft during jump run?**

- a) Determine two lines from the horizon, one ahead and one abreast, and find the intersection of those two lines.
- b) Look straight down and focus on the point that does not move.
- c) Determine two lines from the horizon, one ahead and one parallel, and find the intersection of those two lines.



**18) What must the jumper look for below before exiting the aircraft?**

- a) Previous groups of skydivers.
- b) Clouds and other aircraft.
- c) Both a and b.



## Category D-1 Dive Flow

One AFF instructor

### Freefall Dive Flow

- Assist instructor with spotting.
- Exit in a relaxed arch (grip optional).
- Circle of Awareness.
- Altitude, arch, legs, relax.
- Find a reference point on the horizon and determine the position of the instructor.
- Perform a total of four 90 degree turns while checking your altitude in between each maneuver.
- Altitude, arch, legs, relax.
- Perform alternating 180-degree turns until 6,000 feet; initiate no turns below 6,000 feet.
- Lock on to Altimeter at 6,000 feet.
- Wave-off at 5,000 feet.
- Pull by 4,000 feet.

### Canopy Dive Flow

- Correct common canopy problems (line twist, slider, end cells) using rear risers with brakes set.
- Look right, turn right 90 degrees using rear risers.
- Check altitude, position, and traffic.
- Repeat to the left.
- Check altitude, position, and traffic.
- Release brakes, conduct controllability check and move to the holding area
- Look right, turn right 90 degrees using rear risers.
- Check altitude, position, and traffic.
- Repeat to the left.
- Look right, turn right 180 degrees using rear risers.
- Check altitude, position, and traffic.
- Repeat to the left.
- Check altitude, position, and traffic.
- Practice rear riser flares.
- Return to normal controls for landing by 2,000 feet.
- 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.

*Note: Your hands should go to the rear risers after opening on every jump for collision avoidance. Also note that you can flare your parachute to land with the rear risers in a situation where your toggle(s) are rendered useless.*



## Category D-2 Dive Flow

One AFF instructor

### Freefall Dive Flow

- Assist instructor with spotting.
- Solo poised exit in a relaxed arch.
- Circle of Awareness.
- Altitude, arch, legs, relax.
- Find a reference point on the horizon and determine the position of the instructor.
- Start a turn and stop at 180 degrees.
- Altitude, arch, legs, relax.
- If altitude permits, turn 180 degrees back to instructor.
- Perform alternating 360-degree turns until 6,000 feet; initiate no turns below 6,000 feet.
- Lock on to Altimeter at 6,000 feet.
- Wave-off at 5,000 feet.
- Pull by 4,000 feet.

### Canopy Dive Flow

- Correct common canopy problems (line twist, slider, end cells) using rear risers with brakes set.
- Look right, turn right 90 degrees using rear risers.
- Check altitude, position, and traffic.
- Repeat to the left.
- Check altitude, position, and traffic.
- Release brakes, conduct control check and move to the holding area
- Look right, turn right 360 degrees using rear risers.
- Check altitude, position, and traffic.
- Repeat to the left.
- Check altitude, position, and traffic.
- Practice rear riser flares.
- Return to normal controls for landing by 2,000 feet.
- 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.

*Note: Your hands should go to the rear risers after opening on every jump for collision avoidance. Also note that you can flare your parachute to land with the rear risers in a situation where your toggle(s) are rendered useless.*



## **Advancement Criteria**

### **Spotting and Aircraft**

- Recognize and observe the airport and the spot from the aircraft door during jump run.

### **Exit and Freefall**

- Stability within five seconds after an unassisted poised exit.
- Cumulative four 90 degree turns, within 20 degrees.
- Cumulative two 180-degree and two 360 degree turns, within 45 degrees.

### **Canopy**

- Cumulative two 90-degree rear riser turns with brakes set.
- Cumulative two 90-degree rear riser turns with brakes released.
- One 180-degree rear riser turn, and one 360-degree rear riser turn with brakes released.
- Two rear riser flares above 1,000 feet.
- Stand-up landing.
- Landing within 50 meters of the target with minimal assistance.

### **Equipment**

- Operate the AAD.



# 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:

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

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

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

#### **MPH Miles per Minute Drift from 3,000 feet**

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.

- 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
Average	270	19.5

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
Average	190	15

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

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.



## **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.



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## Categories F-H:

### Group Skydiving Skills

Skydiving is a sport for individualists who like to do things together. In the first portion of the USPA Integrated Student Program, Categories A-E, you focused on the skills required to survive independent freefall: stability control, deployment at the correct altitude, landing in a clear area, and how to use the equipment.

The remaining three categories, F-H, prepare you for more advanced freefall control. You get ready for skydiving in groups in freefall and under canopy. Your education continues in canopy flight, equipment, and aircraft skills essential for safety. Detailed review also continues on the emergency procedures introduced in the first-jump course. Soon, you'll graduate and become independent of supervision.

With the direct assistance of other qualified staff members, such as the USPA Coach, the USPA Instructor continues to supervise your training and monitor your progress during all remaining student jumps until you obtain your USPA A license.

The freefall portions of Categories F through H address group flying techniques and skills. Under the supervision of a USPA Instructor, a USPA Coach may train you for the freefall skills in these last three categories and accompany you in freefall.

After completing all training and jumps at the end of Category H, you may sign up for a USPA A license check dive with a USPA Instructor.

## Category F

### Three Jumps

Tracking is a basic group skydiving skill that enables jumpers to gain sufficient freefall separation for a safe opening. It is such an important skill that the freefall training in this category is devoted entirely to tracking techniques. To begin, while supervising yourself in freefall, practice the basics of the delta position, the first step toward a flat track. The USPA Coach will evaluate and refine your tracking skills as part of the jumps in Categories G and H. Tracking evaluation is also part of the A license check dive with the USPA Instructor.

Flying the canopy slowly and performing flat, altitude-conserving turns is an important skill that can help you out of a difficult landing approach in a tight area. You'll also learn more about how to handle aircraft emergency exit procedures independently. The emergency review includes power line recognition, avoidance, and landing procedures. During this category, you will also make a practice clear and pull from 5,500 feet, followed by a clear-and-pull jump from 3,500 feet, as required for the A license.

By now, you're ready to learn how to pack and should begin working with a packing instructor. The staff continues to build your understanding of aircraft procedures on jump run with emphasis on separation between groups. You also learn the specific procedures for coordinating with the pilot or jumpmaster in the event of an aircraft emergency.

### **Learning and Performance Objectives**

- Introduction to tracking.
- Two clear and pulls (former AFF students).
- Braked turns, approaches, and landings.
- Extending the glide.
- Power-line landing review.
- Packing with assistance.
- Checking others' equipment.
- Procedures following inactivity.
- Winds aloft and the exit point.
- Separating groups during exit.

### **Rules and Recommendations**

#### **Study USPA BSRs applicable to USPA A license holders**

##### 1. Compliance with Federal regulations:

- a. No skydive may be made in violation of Federal Aviation Administration (FAA) regulations.
- b. FAA regulations include the use of restraint systems (seatbelts) in the aircraft by all skydivers during movement on the surface, takeoff, and landing.

##### 2. Medical requirements:

- a. All persons engaging in skydiving must:
  - (1) Carry a valid Class 1, 2, or 3 Federal Aviation Administration Medical Certificate; or
  - (2) Carry a certificate of physical fitness for skydiving from a registered physician; or
  - (3) Have completed the USPA recommended medical statement.



3. Age requirements:

- a. Skydivers are to be at least either:
  - (1) 18 years of age.
  - (2) 16 years of age with notarized parental or guardian consent.

4. Maximum ground winds:

- a. For all solo students:
  - (1) 14 mph for ram-air canopies (StartSkydiving.com is waived to 16 mph for ram-air canopies).
  - (2) 10 mph for round reserves.
- b. For licensed skydivers are unlimited.

5. Minimum container opening altitudes above the ground for skydivers are:

- a. Tandem jumps—4,500 feet AGL.
- b. All students and A license holders—3,000 feet AGL.
- c. B license holders—2,500 feet AGL.
- d. C and D license holders—2,000 feet AGL.

6. Drop zone requirements:

- a. Areas used for skydiving should be unobstructed, with the following minimum radial distances to the nearest hazard:
  - (1) Solo students and A license holders—100 meters.
  - (2) B and C license holders—50 meters.
  - (3) D license holders—unlimited.
- b. Hazards are defined as telephone and power lines, towers, buildings, open bodies of water, highways, automobiles, and clusters of trees covering more than 3,000 square meters.
- c. Manned ground-to-air communications (e.g., radios, panels, smoke, lights) are to be present on the drop zone during skydiving operations.

7. Parachute equipment:

- a. FAA regulations (FAR 105.19) require that when performing night jumps, each skydiver must display a light that is visible for at least three statute miles from the time the jumper is under an open parachute until landing.
- b. All students are to be equipped with the following equipment until they have obtained a USPA A license:
  - (1) A rigid helmet (except tandem students).
  - (2) A piggyback harness and container system that includes a single-point riser release and a reserve static line, except:
    - i. A student who has been cleared for freefall self-supervision may jump without a reserve static line upon endorsement from his or her supervising instructor.
    - ii. Such endorsement may be for one jump or a series of jumps.
  - (3) A visually accessible altimeter.
  - (4) A functional automatic activation device that meets the manufacturer's recommended service schedule.
  - (5) A ram-air main canopy suitable for student use.
  - (6) A steerable reserve canopy appropriate to the student's weight.
  - (7) For freefall, a ripcord-activated, spring-loaded, pilot-chute-equipped main parachute or a bottom-of-container (BOC) throw-out pilot chute.



- c. Students must receive additional ground instruction in emergency procedures and deployment-specific information before jumping any unfamiliar system.
- 8. For each harness-hold jump, each AFF rating holder supervising the jump must be equipped with a visually accessible altimeter.
- 9. All skydivers wearing a round main or reserve canopy and all solo students must wear flotation gear when the intended exit, opening, or landing point is within one mile of an open body of water (an open body of water is defined as one in which a skydiver could drown).
- 10. Special altitude equipment and supplementary oxygen:
  - a. Supplementary oxygen available on the aircraft is mandatory on skydives made from higher than 15,000 feet (MSL)

## **Equipment**

- 1. Pack at least one parachute with the assistance of a knowledgeable packer.
- 2. Discuss the most important points of packing (Note: An FAA rigger is your best resource for this discussion):
  - a. Lines straight and in place in the center of the completed pack job.
  - b. Slider up (orientation closest to the canopy).
  - c. Tight line stows to prevent premature line deployment.
- 3. Perform a pre-jump equipment check on another jumper who is in full gear:
  - a. "Check of threes" in the front:
    - (1) Three-ring assembly (and reserve static line).
    - (2) Three points of harness attachment for snap assembly and correct routing, adjustment, and no twists.
    - (3) Three operation handles-main activation, cutaway, reserve.
  - b. Pin check back of system, top to bottom:
    - (1) Reserve pin at least halfway seated (and automatic activation device on).
    - (2) Main pin fully seated.
    - (3) Ripcord cable movement or correct bridle routing.
    - (4) If collapsible pilot chute, check the indicator window.
    - (5) Activation handle in place.
  - c. Check personal equipment ("SHAGG"):
    - (1) Shoes-tied, no hooks.
    - (2) Helmet-fit and adjustment.
    - (3) Altimeter-set for zero.
    - (4) Goggles-tight and clean.

## **Spotting and Aircraft**

- 1. Acting without a rated USPA instructor during routine jump operations and aircraft emergencies:
  - a. The person spotting the load usually serves as the jumpmaster.



- b. In larger aircraft, the jumpmaster should establish an exclusive chain of communication with the pilot:
  - (1) A communication assistant should be able to communicate directly with the pilot and the jumpmaster simultaneously.
  - (2) Other jumpers should not get involved in communication among the pilot, communications assistant, and the jumpmaster.

2. Review of low-altitude exit procedures:

- a. The jumpmaster must determine if jumpers are over a safe landing area and communicate this information to the pilot.
- b. Establish firm altitudes at which certain aircraft emergency decisions would be made (DZ policy):
  - (1) Altitude below which all jumpers will land with the aircraft (< 1000 feet)
  - (2) Altitude below which all jumpers will jump using their reserves (1000 feet – 2500 feet)
  - (3) Altitude below which all jumpers will jump and immediately use their main parachutes (> 2500 feet)
- c. Jumpers must maintain correct weight distribution in the aircraft, especially during emergency exit procedures.

3. The effect of the winds aloft on the exit point:

- a. Subtract the speed of the headwind on jump run (if flown into the wind) from the airspeed of the aircraft to determine the ground speed.
- b. Jumpers first get thrown forward on exit (approximately 0.2 miles in calm winds, less with headwind) from residual aircraft speed and then fall straight down or blow toward the target.
- c. The winds aloft will cause freefalling jumpers to drift according to the wind's strength and direction.
- d. Winds generally diminish at lower altitudes.
- e. Average the speed and the direction of the winds from exit altitude to 3,000 feet AGL to estimate freefall drift. See the example in Table F.1 for a sea-level drop zone:

Altitude	Heading	Speed (mph)
3,000 ft	250	07
6,000 ft	260	14
9,000 ft	270	16
12,000 ft	290	23
Average	270	15

Table F.1 - Note: 15 mph = ¼ mile per minute

- (1) If flying jump run upwind, use the average heading of 270 degrees.
- (2) Aircraft forward throw is approximately 1/8-1/4 mile upwind in the light-to-moderate headwind.
- (3) Jumpers fall for one minute, drifting at 1/4 mile per minute for 1/4 mile of drift downwind.
- (4) Since the forward throw and the freefall drift approximately cancel each other, the ideal exit point is almost straight over the ideal opening point in this example.

4. Group separation on jump run.



5. Perform all duties on jump run with minimum assistance, including:

- a. Operating the door (if the pilot allows)
- b. Monitoring progress during jump run
- c. Directing the pilot to the correct spot
- d. Choosing the correct exit point

## **Exit and Freefall**

1. Initiating track:

- a. First locate a point on the horizon.
- b. Smoothly extend both legs fully to initiate forward motion.
- c. Control in the delta and track positions:
  - (1) Dip one shoulder slightly in the direction of the turn to make heading corrections (instructor technique may differ).
  - (2) Make only small corrections.
- d. Slowly extend your torso by stretching your shoulders toward your ears and flatten your arch.
- e. Fully extend your arms to the side 90 degrees to your spine and level with your hips (instructor technique may vary).

2. Refining the track:

- a. Once establishing a heading in a positive forward dive, fully extend both legs with your knees locked and toes pointed.
- b. Stiffen your body slowly into a slight reverse arch, pushing down and forward slightly with your shoulders, while keeping your hands level with your hips.
- c. Continually adjust your body position to effectively meet the relative wind.

## **Emergency Procedure Review**

1. Recognizing and avoiding power lines:

- a. Expect power lines along roads, between buildings, in paths in the forest, and in random places.
- b. Scan every 500 feet of descent into an unfamiliar landing area and continually scan below 500 feet.

2. Power-line landing emergency procedures.

- a. Avoid the area early during the canopy descent. Use minimum braked turns as necessary to avoid power lines. Land parallel to the wires when possible.
- b. Feet and knees together, flare at least half way and prepare for a hard landing.
- c. Place your hands inside the front and rear risers. Touch no more than one wire at a time.
- d. If suspended in the wires, the parachute can conduct electricity so the power needs to be shut off before making contact with one or anything on the ground.

3. Tracking practice procedure:

- a. Experienced jumpers often allow only five to ten seconds to obtain adequate separation.
- b. Practice entering and refining an on-heading track for ten seconds, reversing direction, and repeating.



#### 4. Tracking jump safety:

- a. Fly exactly perpendicular to the jump run to avoid others up and down the line of flight.
- b. Always plan tracking dives with other groups in mind.
- c. Learn to control a track on heading first, then develop techniques for pitch and speed.

#### 5. Clear and pull:

- a. A clear and pull is used for emergency exits and pre-planned low-altitude jumps.
- b. Use a familiar, stable exit technique.
- c. Present your hips to the relative wind and execute normal pull procedures (without wave-off) to deploy within five seconds of exit.
- d. Expect the parachute to open in relation to the relative wind, not overhead as usual.
- e. The sequence consists of a clear and pull from two altitudes:
  - (1) First from 5,500 feet.
  - (2) Once successful, from 3,500 feet.

## **Canopy**

#### 1. Braked turns:

- a. Performed correctly, braked turns provide the quickest heading change with the least altitude lost.
- b. A braked turn may be the best choice when a quick heading change is needed:
  - (1) When suddenly encountering another jumper under canopy or someone in the landing area.
  - (2) Recognizing an obstacle.
  - (3) Too low to recover from a full-flight turn.
- c. Practice braked turns:
  - (1) From the slowest speed at which the canopy will fly, raise one toggle slightly to initiate a heading change in the opposite direction.
  - (2) Try to change heading as quickly as possible without banking or stalling.

#### 2. Using brakes to attain the maximum glide and minimum descent:

- a. On lower-glide designs, the minimum descent may begin nearer the half-braked position.
- b. On higher-glide designs, the minimum descent may be nearer the three-quarter braked position or just prior to a full stall (reverse flight).
- c. Some canopies achieve minimum descent using the back risers instead of the toggles.
- d. Minimum sustainable descent (float):
  - (1) Allows the jumper to remain above other jumpers on descent.
  - (2) Allows the canopy to cover a greater distance.

#### 3. Recognizing and adjusting for minimum descent and maximum glide ("accuracy trick"):

- a. Look ahead to the point on the ground that appears not to rise or sink in your field of vision:
  - (1) Everything before that point appears to fall.
  - (2) Everything beyond it appears to rise.
  - (3) That point is the projected landing point on the canopy's current glide slope.



- b. Pull the toggles down slightly to see if the stationary point moves farther away:
    - (1) If so, the glide slope has flattened.
    - (2) The canopy will cover more distance.
  - c. Repeat until the point begins to move closer, then return to the maximum glide position that you have just determined.
4. When flying downwind in maximum glide:
- a. As the winds decrease at lower altitudes, your glide slope will degrade.
  - b. The actual landing area will be closer than you initially anticipated.
5. Increasing the glide when flying against the wind:
- a. In lighter winds, may improve distance.
  - b. In stronger winds, may slow the canopy too much and reduce its upwind range.
6. Braked pattern and landing approach:
- a. Fly one entire landing pattern in at least half brakes, to determine the effect on glide path.
  - b. Plan for a change in glide slope:
    - (1) A lower-glide design may require a smaller pattern when flown in brakes.
    - (2) A higher-glide design may require a bigger pattern when flown in brakes; extend the final approach to avoid overshooting the target.
  - c. Fly final approach in quarter to half brakes.
  - d. Flare carefully from the braked position:
    - (1) Practice high to avoid a stall.
    - (2) To get the best flare may require a shorter, quicker stroke initiated lower to the ground.
    - (3) The stall may occur more abruptly.
    - (4) Plan for a PLF.
  - e. A smaller canopy may descend too quickly in deep brakes for a safe braked landing.
7. Accumulate two unassisted landings within 25 meters of the planned target.



## Category F Quiz

(Must be passed before Category F jump)

- 1. What is the best way to change the direction of canopy flight while conserving the most altitude?**
  - a) Braked turns.
  - b) Rear riser turns.
  - c) Front riser turns.
- 2. What happens if a canopy is controlled too deeply in brakes?**
  - a) It dives.
  - b) It bucks.
  - c) It stalls.
- 3. Describe the difference between flaring from half brakes and full glide?**
  - a) Flaring from half brakes requires a quicker stroke, the stroke is shorter, and stalls occur sooner.
  - b) Flaring from half brakes requires a slower stroke, the stroke is shorter, and stalls occur sooner.
  - c) Flaring from half brakes requires a slower stroke, the stroke is longer, and stalls occur sooner.
- 4. How does the half-braked position affect the canopy's flight?**
  - a) Speeds descent, changes glide.
  - b) Slows descent, changes glide.
  - c) Slows descent.
- 5. How is heading corrected during a track?**
  - a) Dip leg in direction of the turn.
  - b) Turn head slightly towards direction of the turn.
  - c) Dip one shoulder slightly in the direction of the turn.
- 6. When making tracking jumps from a large plane, why is it important to track perpendicular to the jump run?**
  - a) To stay clear of FAA controlled airspace.
  - b) To avoid other groups ahead and behind.
  - c) To avoid plane on its descent.
- 7. What is the ground speed of a jump aircraft with an airspeed of 90 mph when flying against a 50 mph headwind on jump run?**
  - a) 40 mph
  - b) 140 mph
  - c) 90 mph
- 8. How can jumpers assure adequate separation between groups exiting the aircraft?**
  - a) Count slowly to five.
  - b) Gauge separation according to position over the ground.
  - c) Gauge separation according to GPS instruments.
- 9. What are the three most important aspects of packing the main canopy?**
  - a) Stow brakes, lines straight and in place in the center, nose rolled tightly.
  - b) Lines straight and in place in the center, slider up, tail rolled tightly.
  - c) Lines straight and in place in the center, slider up, tight line stows.



**10. How can you tell if the RSL is routed correctly?**

- a) Clear path from snap shackle to guide ring.
- b) Buckle is fully closed.
- c) Red tab is visible.

**11. What is the minimum pull altitude allowed for student skydivers and A license holders?**

- a) 3,000 feet
- b) 2,500 feet
- c) 2,000 feet

**12. What are the maximum winds allowed for student skydivers at StartSkydiving.com?**

- a) 10 mph
- b) 16 mph
- c) 18 mph

**13. If a jumper falls for one minute through upper winds averaging 30 mph from the west:  
How far will the jumper drift?**

- a) 1/2 mile
- b) 1/4 mile
- c) 3/4 mile

**14. (continued from 13) If a jumper falls for one minute through upper winds averaging 30 mph from the west: In which direction will the jumper drift?**

- a) west
- b) east
- c) north-northeast

**15. What is the procedure for landing in power lines?**

- a) Make any maneuvers necessary to avoid landing in power lines.
- b) Avoid the area early during the descent, minimum braked turn necessary to avoid lines, land parallel to the wires, braked landing, prepare for PLF, try to touch only one line at a time, wait for help and confirmation that the power has been turned off and will remain off until recovery operations are complete.
- c) Get as big as possible, disconnect RSL (if time), cut away, prepare to PLF.

**16. In the event of an aircraft emergency with no students or instructors aboard, who should coordinate procedures between the pilot and the other jumpers on the load?**

- a) The person closest to the pilot.
- b) The most senior jumper.
- c) Jumpmaster or spotter.

**17. How many jumps are required for the USPA A license?**

- a) 20
- b) 25
- c) 30

**18. What does a USPA A license permit a skydiver to do?**

- a) Compete in USPA competitions and events.
- b) Jump without supervision and pack anyone's main parachute.
- c) Jump without supervision, pack his or her own main parachute and engage in basic group jumps



**19. What should an A-licensed jumper do to regain currency after a ten-week period of inactivity?**

- a) Make at least one jump under the supervision of a USPA instructional rating holder.
- b) Go through the first jump course and repeat all necessary ISP categories.
- c) Make at least one static line jump.

**20. What should an A-licensed jumper do to regain currency after a four-month period of inactivity?**

- a) Make at least one jump beginning in Category D with a USPA AFF Instructor or in Category B with a USPA IAD Static-Line, or Tandem Instructor before proceeding to unsupervised freefall.
- b) Make at least one jump under the supervision of a USPA instructional rating holder.
- c) Go through the first jump course and repeat all necessary ISP categories .





## Category F-1 Dive Flow

One AFF Instructor or USPA Coach

### Freefall Dive Flow

- Spot with minimal assistance.
- Choice of exit position.
- Turn 90° from line of flight.
- Check altitude.
- Track for five seconds, turn 180°, return.
- Check altitude.
- Repeat until 6,000 feet.
- Wave off and pull by 4,000 feet.

### Canopy Dive Flow

- Discovery of stall point.
- Discovery of flattest glide; lowest descent.
- Practice flaring from deep brakes.
- Practice 180 degree turns while flying in deep brakes.
- Identify all the power lines in the area during descent.
- 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 in brakes.
- Prepare to PLF.
- Landing flare from brakes (if using a suitable canopy).

## Category F-2 Dive Flow

One AFF Instructor or USPA Coach

### Freefall Dive Flow

- Clear and pull from 5,500 feet.
- Spot with minimal assistance.
- Poised exit.
- Initiate deployment within five seconds.

### Canopy Dive Flow

- Same as F-1 Canopy Dive Flow.

## Category F-3 Dive Flow

One AFF Instructor or USPA Coach

### Freefall Dive Flow

- Clear and pull from 3,500 feet.
- Spot with minimal assistance.
- Poised exit.
- Initiate deployment within five seconds.

### Canopy Dive Flow

- Same as F-1 Canopy Dive Flow.



## **Advancement Criteria**

### **Aircraft and Spotting**

- Spot the aircraft, including all procedures, with minimum assistance.

### **Exit and Freefall**

- Cumulative three tracking sequences: track for ten seconds within 30 degrees of the planned heading, turn 180 degrees, and track back for ten seconds.
- Two clear and pulls (already accomplished by former IAD and static-line students).

### **Canopy**

- Cumulative four 180-degree turns under canopy while flying in deep brakes.
- Braked approach and landing on a canopy that allows for a safe braked landing.
- Cumulative two unassisted landings within 25 meters of the planned target (jumps from previous categories count toward accuracy requirements) equipment.
- One complete pack job with assistance.
- Perform a pre-jump equipment check on another jumper fully rigged and ready to jump.

## Category G

### Three Jumps

Freefall skills in Category G address group skydiving maneuvers. They are outlined here for the discipline of formation skydiving (flat, or belly flying) but can be performed in other orientations with a USPA Coach knowledgeable in those techniques. The same performance and advancement criteria for maneuvering, docking, break-off, and gaining separation for a safe opening apply.

In Category G, you'll review, in more in depth, the procedures for avoiding and responding to canopy collisions, which are always more of a risk in group jumping. By now, you should be looking for traffic and steering with back risers before releasing your brakes. After opening, you'll explore the performance envelope of the ram-air canopy to prevent surprises near the ground. Practice includes maximum-performance turns, reverse turns, and keeping the wing in balance during performance maneuvers to avoid a line twist. You'll learn to feel the turn. You'll also take another look at avoiding tree landings and what to do in case one is inevitable.

By now, you should be packing with minimal assistance, but USPA recommends supervision until your A license. Along with practicing packing, you'll learn how to inspect the equipment for wear and how to prevent it. Before advancing, you should understand the responsibilities of the FAA rigger, who maintains most items. All skydivers need to respect the power of various kinds of weather, which begins with understanding basic weather patterns and reading the danger signals. A pilot or instructor advises you on practical ways to predict the kind of weather that could compromise your safety.

### **Learning and Performance Objectives**

- Group exits.
- Floater position.
- Forward and backward movement.
- Adjusting fall rate.
- Start and stop.
- Docking.
- Maximum-performance canopy turns.
- Canopy collision avoidance and response review.
- Tree landing review.
- Equipment maintenance inspection.
- Weather for skydivers.

### **Rules and Recommendations**

1. It requires at least an FAA senior rigger to maintain and repair the parachute system.
2. AADs, if installed must be maintained according to the manufacturer's instructions.

### **Equipment**

1. Detailed identification and inspection of high-wear items requiring rigger maintenance:
  - a. Pilot chute and deployment handle:
    - (1) Look for broken stitching around the apex and the seam where the pilot chute canopy fabric and mesh meet.
    - (2) Check for security at the bridle attachment point.
    - (3) The fabric and mesh should be in good condition; both eventually wear out.



- b. Bridle Velcro:
  - (1) Velcro anywhere degrades with use and needs to be replaced every 100-250 uses.
  - (2) Bridle velcro is particularly important, because if it comes loose, it can cause a premature deployment.
  - (3) Velcro should be clean, dry, and free of debris.
- c. Deployment bag:
  - (1) Look for distortion in the grommets, especially at the bridle, and fabric damage around their edges.
  - (2) Check the loops that hold the line stow bands.
  - (3) If velcro is used, replace it as necessary.
- d. Closing pin:
  - (1) Check that the loop holding the closing pin to the bridle is secure and not being cut by the eye of the pin.
  - (2) Check for nicks or corrosion on the pin and replace it if any appear.
- e. Bridal attachment:
  - (1) Look for wear where the bridle attaches to the canopy.
  - (2) Look for broken stitching on the canopy itself where it is reinforced for the bridle attachment loop or ring.
- f. Likely areas of damage on the top center skin, end cells, and stabilizers:
  - (1) Check for small holes on the top skin from where the bridle attachment stop ring has caught fabric in the bag's top grommet (avoidable with good packing technique).
  - (2) Look for wear on the top skin and end cells caused by contact with sharp objects or stickers.
  - (3) Look for wear in and around the reinforcements in the stabilizers that contain the slider stops.
  - (4) Look for broken or missing stitching along the seams.
- g. Slider:
  - (1) Inspect for distortion in the slider grommets and wear around their inside edges.
  - (2) Sliders are important, high stress components and should be maintained to the highest standard.
- h. Lines:
  - (1) Look for wear anywhere along the lines, but especially where the slider grommets contact metal connector links.
  - (2) Line damage at the links calls for line replacement, but the rigger can also advise the jumper about link choices, protection and habits that minimize damage.
  - (3) Lines sometimes shrink unevenly over time.
  - (4) All lines eventually require replacement; refer to the manufacturer's recommendations.
- i. Slider bumpers (metal connector links):
  - (1) Slider bumpers protect the slider grommets and lines from damage by taking it themselves; most require periodic replacement.
  - (2) Slider bumpers need to be tight on the link or secured to prevent them from sliding up the lines and stopping the slider.
- j. Brake system:
  - (1) When velcro is used, placing the toggles on the risers immediately after landing prevents velcro damage and tangles.
  - (2) Velcro needs to be replaced when worn.
  - (3) Velcro and general use wears the lower brake lines, which a rigger can easily replace.
  - (4) Examine the brake lock eye for damage and wear.
  - (5) Look at the attachment point for the keeper ring, including the attachment ring stitching on the opposite surface of the riser.
  - (6) Inspect tuck-tab toggle keepers for security.



k. Riser release system:

- (1) Look for wear in the loops holding the rings and the white retaining loop, especially if you drag your rig when stowing the lines (not advised).
- (2) Be sure that any service bulletins on risers for the system has been completed.
- (3) Check the fittings on both ends of the cable housings for security.
- (4) Look for kinks in the release cable where it contacts the white retaining loop, which may indicate a problem with hard openings or the design and construction of the three-ring assembly.
- (5) Check the front and back of the riser webbing for fraying or strains around the edges of the grommets.
- (6) Look for broken or loose tacking on the cable housings.
- (7) Check riser inserts (for cutaway cable ends) if installed.

l. Riser covers:

- (1) Replace any retaining velcro when it loses tackiness.
- (2) Replace distorted tuck flaps when they become ineffective (happens with use).

m. Main container closing grommets:

- (1) Inspect for distortion and fabric damage around the edges.
- (2) Feel for severe distortion or breakage of the plastic stiffener inside the fabric where the grommet is set.

n. Main and reserve pin covers:

- (1) Replace velcro when it fails to stay firmly attached.
- (2) Replace plastic stiffeners when distortion from use renders them ineffective.

2. Store the parachute in a cool, dry, dark place:

- a. Heat weakens AAD batteries; cars are too hot for safe prolonged storage in the summer.
- b. The ultraviolet rays of the sun degrade nylon.
- c. Moisture:
  - (1) Corrodes hardware (very dangerous, since rust degrades nylon)
  - (2) Promotes mildew (undesirable but harmless to nylon)
- d. Many chemicals and acids damage parachute materials.
- e. Heat may weaken elastic stow bands.

3. Premature deployments become more dangerous in groups:

a. AADs:

- (1) Use caution when wearing an AAD, especially near an open aircraft door and during climb out.
- (2) Adhere strictly to the AAD manufacturer's service standards--
  - i. To improve their chances for correct operation.
  - ii. To help prevent premature AAD activation.
  - iii. To comply with the law.

- b. Remain clear of the area directly above and below another jumper, in case his or her parachute activates prematurely from the AAD or other unplanned event.

4. Pack one main parachute without assistance.



## **Spotting and Aircraft**

1. Refer to the information on weather in SIM Section 5.5:
  - a. Weather conditions hazardous to skydivers.
  - b. Practical methods to observe weather and obtain forecasts.
2. Select the spot and guide the pilot to the correct position without assistance in routine weather conditions.

## **Exit and Freefall**

1. Group exits:
  - a. Practice for an efficient climbout and launch:
    - (1) Each jumper in a group has an assigned exit position and should know that position before climb out.
    - (2) The exit position should include specific, exact foot and hand placement for the best launch position and presentation of hips and limbs into the relative wind.
    - (3) The jumpers count together with body movement, where possible, for a simultaneous or near-simultaneous launch.
  - b. Exit into a neutral body position and hold aircraft heading.
  - c. Relax and confirm stability prior to turning towards your coach.
  - d. Establish stability independently on exit before turning toward your partner.
  - e. Exit grips:
    - (1) If taken, grips should allow all jumpers to leave in a natural flying position.
    - (2) Main lift web and chest strap grips are counterproductive for most belly-to-earth group exits.
2. Forward and backward movement (belly to earth):
  - a. Use legs only for forward movement and steering:
    - (1) Extending both legs tilts the jumper head-low and begins a slide in that direction.
    - (2) Extending one leg more than the other causes a turn in the opposite direction:
      - i. Extending the right leg causes a left turn.
      - ii. Extending the left leg causes a right turn.
  - b. Maintain both arms in neutral during forward movement and docking.
  - c. Extend both arms and push down for backward movement.
  - d. Extending the arms slightly to take a grip will counter forward movement but cause backsliding if initiated too soon or for too long.



### 3. Adjusting fall rate (belly to earth):

- a. Increase vertical freefall speed by streamlining:
  - (1) Hips forward.
  - (2) Shoulders back.
  - (3) Relax abdominal muscles.
- b. Slow freefall speed by maximizing surface area:
  - (1) Cupping the shoulders around the sternum.
  - (2) Rounding the spine (cupping the abdomen).
  - (3) Extending arms or legs to counterbalance and maintain a level attitude.
- c. When recovering altitude from below the level of a formation:
  - (1) Turn 90 degrees relative to the formation to keep it in view.
  - (2) To avoid a collision, remain clear of the area immediately below and above any group.
- d. Recognize the visual cues for level approach (on exit, regardless of the horizon):
  - (1) Backpack in sight-come down.
  - (2) Front of the leg straps in sight-come up.
- e. Maintain altitude awareness.

### 4. Docking:

- a. Dock using a level approach.
- b. Once docked, arch across the shoulders to maintain the fall rate (elbows up) and stay level with your partner or the formation.
- c. Extend both legs to counter any tension created in the formation when holding grips.
- d. Maintain altitude awareness.

### 5. Break-off:

- a. Check altitude every four or five seconds and after each maneuver.
- b. Break off without prompting.
- c. Plan the break-off altitude to allow enough time to track 50 feet.
- d. The most positive way to signal break-off is to turn and track.
  - (1) As a safety back-up in Categories G and H:
    - i. If the coach waves his or her arms, immediately turn and track to the planned deployment altitude.
    - ii. If the coach deploys, deploy immediately without tracking.
    - iii. Deploy at planned altitude whether or not you have turned or tracked.
    - iv. Never rely on the USPA Coach for break off or deployment cues.
  - (2) You are always responsible to break off and open at the planned altitude on jumps with the USPA Coach and with others after you get your license.
- e. When tracking, establish and maintain the correct heading for the radius of the formation.
- f. For beginners, tracking moderately in a straight line in the right direction is more effective than going fast in a curve or in the wrong direction. Break off high enough to gain separation.

### 6. For additional requirements for break-offs from freeflying jumps, see SIM Section 6-2.

### 7. To avoid hard openings, slow down to a minimum freefall velocity before deploying by maintaining a neutral belly-to-earth body position.



## **Emergency Procedure Review**

*Note: A USPA Instructor should teach this section. A canopy formation specialist is also a good source.*

1. Canopy collision avoidance (review):
  - a. Know where other nearby jumpers are during opening and steer with the back risers to avoid them.
  - b. If a head-on collision is pending, both jumpers should turn right.
2. Collision response: Study the USPA recommended procedures in SIM Section 5-1.
3. Tree landing avoidance:
  - a. Spot clear of large areas of trees or other obstacles, and open high enough to clear them in the event of a bad spot.
  - b. Fly in maximum glide to reach a clear area.
4. Tree landing procedure review:
  - a. Avoid the area early during the canopy descent. Use minimum braked turns as necessary to avoid trees.
  - b. Feet and knees together, flare at least half way and prepare for a hard landing.
  - c. Protect your face with both hands and forearms, with both elbows tightly together and close to your stomach.
  - d. Try for the middle of the tree, then hold onto the trunk or main branch to avoid falling.
  - e. Stay in the tree and wait for help. Do not attempt to climb down.

## **Canopy**

1. Performance turn initiation and completion with balance:
  - a. Enter a turn only as quickly as the canopy can maintain balance (center of lift over the center of load) during the turn.
  - b. Surging, lurching, or line twist indicate a turn entered too quickly.
  - c. A canopy is more susceptible to collapse from turbulence during entry and exit from a turn.
  - d. The canopy dives sharply after a maximum-performance turn.
2. Reverse turns:
  - a. You must know the maximum safe rate of turn entry for each canopy you jump.
  - b. Practicing reverse turns helps you determine the maximum safe toggle turn rate before inducing a line twist.
  - c. Make a smooth but deep turn at least 90-degrees to the right, then reverse toggle positions smoothly but quickly for a 180-degree turn to the left (four sets recommended to complete Category G).
  - d. A line twist at pattern altitudes may be unrecoverable in time for a safe landing, particularly with a higher wing loading.
  - e. In case you induce a line twist, you should complete all maximum-performance turns above the 2,500-foot decide-and-act altitude for a cutaway.





3. The potential for collision with other jumpers increases when making performance maneuvers in traffic or near the ground (review):
  - a. Other jumpers may be focused more on the target than on traffic.
  - b. The lower jumper has the right of way.
  - c. It takes only one jumper to avoid a collision.
  - d. Jumping a faster canopy requires more attention to traffic.
4. Accumulate two unassisted landings within 20 meters of a planned target. (Total of five required for A license)



## Category G Quiz

(Must be passed before Category G jump)

**1) What is the primary directional control when moving forward to dock in freefall?**

- a) Arms
- b) Legs
- c) Shoulders

**2) What is the minimum break-off altitude for freefall in groups of five or fewer?**

- a) 1,500 feet above planned deployment altitude.
- b) 2,000 feet above planned deployment altitude.
- c) 1,000 feet above planned deployment altitude.

**3) What is the danger of entering a toggle turn too quickly?**

- a) Stall
- b) Line twist
- c) Line over

**4) What does a canopy do after completing a maximum input toggle turn?**

- a) It stalls.
- b) It planes out.
- c) It dives.

**5) What are the three biggest dangers of a hard toggle turn near the ground?**

- a) 1: line twist; 2: collision with jumpers; 3: collision with the ground
- b) 1: stall; 2: collision with jumpers; 3: collision with the ground
- c) 1: line twist; 2: loss of control; 3: stall

**6) What are the first things to do in the event of a collision and entanglement with another jumper?**

- a) Check altitude, establish communication.
- b) Clear entanglement, check condition of other jumper.
- c) Cut away and deploy reserve.

**7) What is the most critical aspect of closing the main container equipped with a hand-deployed pilot chute?**

- a) Closing pin loop is as far up the closing pin as possible.
- b) Bridle routing and placement.
- c) Orientation of closing pin.

**8) Why is it a bad idea to drag the harness and container system when stowing the lines?**

- a) Foreign objects could get caught in the lines.
- b) It causes unnecessary wear on the three-ring release webbing and loops.
- c) Harness and container fabric colors will fade faster.

**9) When Velcro is used on the brake system, why is it a good idea to place your toggles back on the Velcro after you land?**

- a) It covers the hook Velcro, which can damage other components, and prevents tangles.
- b) It regenerates the Velcro mechanism.
- c) It will prevent future brake fires.



**10) Who is responsible for maintaining a main parachute system?**

- a) The owner of the system.
- b) The main parachute manufacturer.
- c) An FAA rigger.

**11) Why is it bad to leave a parachute in the sun?**

- a) Ultraviolet rays degrade nylon.
- b) Nylon overheats easily.
- c) The colors will fade prematurely.

**12) What damage could occur from storing a parachute for prolonged periods in a car during the summer?**

- a) Car exhaust fumes degrade materials.
- b) Nylon retains folds and will not open properly.
- c) Shorter life for AAD batteries, stow band degradation.

**13) What happens to Velcro touch fastener when it is used frequently?**

- a) It loses tackiness.
- b) Its durability increases.
- c) Nothing.

**14) What happens to stiffened tuck flaps that are frequently used?**

- a) Distortion
- b) Strengthening
- c) Nothing

**15) Who publishes and enforces rules regarding parachute packing and parachute maintenance?**

- a) FAA
- b) USPA
- c) Parachute manufacturers

**16) What may result if recovering altitude (floating up) under a freefall formation?**

- a) Collision with formation, funnel.
- b) Premature AAD fire.
- c) Formation will re-form quicker.

**17) What extra consideration is required when wearing an AAD near the open door of an aircraft or when climbing out?**

- a) Aircraft's magnetic field could damage the AAD.
- b) No extra consideration is required.
- c) AAD activation near the open door of an aircraft presents a dangerous situation.

**18) Why is it important to remain clear of the area directly above and below other jumpers in freefall?**

- a) To comply with FAA regulations.
- b) To minimize outcome of accidental AAD activation or other unplanned event.
- c) To maintain clear line of sight with the ground at all times.



**19) Why is it important to maintain an automatic activation device to the manufacturer's standards?**

- a) To improve their chances for correct operation, to help prevent premature AAD activations, to comply with the law.
- b) To ensure warranty coverage from the manufacturer.
- c) It will not function otherwise.

**20) What is the correct response to a canopy entanglement with another jumper below 1,000 feet if it appears the two canopies cannot be separated in time for a safe landing?**

- a) Cut away and prepare to PLF.
- b) Cut away and deploy the reserve.
- c) Deploy the reserve.

**21) Describe your procedure for landing in trees?**

- a) Face into the wind, prepare for PLF, flare to half brakes, protect face and under arms, wait for help.
- b) Cut away 5-10 feet above top of trees, PLF.
- c) Use any maneuver necessary to avoid landing in trees.

**22) What does a tall cumulus cloud indicate?**

- a) Calm weather.
- b) Thunderstorms in the area.
- c) High temperatures.

**23) What is the most dangerous part of an incoming front for aircraft and skydivers?**

- a) Thunderstorms in the gust front; rapid and significant changes in winds.
- b) Colder temperatures.
- c) Higher barometric pressure can damage altimeters and AADs.

## Category G-1 Dive Flow

One AFF Instructor or USPA Coach

### Freefall Dive Flow

- Coach and student observe spot.
- Front float exit position.
- Check in and initiate count after coach OK.
- Face the direction of flight until stable.
- Coach moves into position and docks.
- Check altitude every five seconds or after each maneuver.
- Coach backs up five feet and adjusts levels as necessary.
- Move forward and take grips.
- Coach backs up ten feet; move forward and take grips.
- Repeat until break off.
- Initiate break-off at 5,500 feet and turn to track.
- Coach remains in place and evaluates track.
- Wave off and pull by 3,500 feet.

### Canopy Dive Flow

- Check altitude, position, and traffic.
- Make a sharp, balanced 90-degree turn.
- Reverse the toggle position aggressively and make a balanced 180-degree turn.
- Check altitude, position, and traffic.
- Repeat to no lower than 2,500 feet, in case of line twist.
- 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.
- Coach measures the student's landing distance from a planned target.

## Category G-2 Dive Flow

One AFF Instructor or USPA Coach

### Freefall Dive Flow

- Coach and student observe spot.
- Rear floater exit position.
- Check in and initiate count after coach OK.
- Face direction of flight until stable.
- Turn to face coach.
- Coach moves into position and docks.
- Check altitude every five seconds or after each maneuver.
- Coach backs up five feet and increases fall rate.
- Remain in position and match coach's fall rate.
- Coach slows fall rate.
- Remain in position and match coach.
- Repeat until response is quick and accurate.
- Break off at 5,500 feet.
- Coach remains in place and evaluates track.
- Wave off and pull by 3,500 feet.

### Canopy Dive Flow

- Check altitude, position, and traffic.
- Make a sharp, balanced 90-degree turn.
- Reverse the toggle position aggressively and make a balanced 180-degree turn.
- Check altitude, position, and traffic.
- Repeat to no lower than 2,500 feet, in case of line twist.
- 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.
- Coach measures the student's landing distance from a planned target.



## Category G-3 Dive Flow

One AFF Instructor or USPA Coach

### Freefall Dive Flow

- Coach and Student observe spot.
- Review either floater position.
- Check in and initiate count after coach OK.
- Face direction of flight until stable.
- Turn to face coach.
- Coach moves into position and docks.
- Check altitude every five seconds or after each maneuver.
- Coach backs up ten feet and changes fall rate.
- Match coach's fall rate to level and dock.
- Repeat until response is quick and accurate.
- Break off at 5,500 feet.
- Coach remains in place and evaluates track.
- Wave off and pull by 3,500 feet.

### Canopy Dive Flow

- Check altitude, position, and traffic.
- Make a sharp, balanced 90-degree turn.
- Reverse the toggle position aggressively and make a balanced 180-degree turn.
- Check altitude, position, and traffic.
- Repeat to no lower than 2,500 feet, in case of line twist.
- 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.
- Coach measures the student's landing distance from a planned target.

## Advancement Criteria

### **Aircraft and spotting**

- Spot the aircraft, including all procedures, without assistance.

### **Exit and Freefall**

- Two re-docks from ten feet without assistance.
- Two re-docks requiring an adjustment in fall rate.
- Break off at the planned altitude without prompting.
- Track 50 feet within ten degrees of the planned heading.

### **Canopy**

- Four maximum-performance reverse canopy turns.
- Two unassisted landings within 20 meters of the target (jumps from previous categories count toward accuracy requirements).

### **Equipment**

- One complete pack job without assistance.

## Category H

### Two jumps

The last category of the ISP finishes preparing you for the USPA A license so you can supervise yourself as an independent skydiver. These are the last jumps where you require USPA Instructor supervision. Next you take your test.

Freefall skills combine gross movements using the start and stop principle to swoop toward a position in the sky relative to another jumper, followed by the fine movements to safely dock that you learned in Category G. The freefall briefing includes a discussion on safety and the importance of recognizing and controlling formation approach speeds. You'll also learn to look around while tracking, signaling for pull, and during deployment.

Under canopy, students with sufficient upper body strength explore the use of the front risers. The instructor explains the benefits and dangers of front-riser maneuvers. The discussion includes how to best recover from a turn made too low, one of the sport's biggest killers. Emergency procedure review covers unintentional water landings. You should be able to demonstrate how to maintain the three-ring release system and replace a main container closing loop, two common owner operations.

Although A license holders are not qualified for demonstration jumps, you will be authorized to jump off the regular DZ into landing areas meeting the BSRs for students and A license holders. In this last category as a formal skydiving student, you'll study the FAA requirements for jumps into the airspace over a private field, including what additional approvals may be necessary for the jump aircraft. This discussion should be with a jump pilot who can discuss those sections of FAR 105.

### Learning and Performance Objectives

- Diving exit.
- Swooping.
- Break off.
- Front riser control.
- Water landing review.
- Owner maintenance of gear.
- Aircraft radio requirements.
- FAA notification requirements for jumping.
- FAA approvals for jump planes.

### Rules and Recommendations

Review all the *Rules and Recommendations* sections for each category to prepare for the oral quiz given as part of the USPA A License check dive.

### Equipment

1. Owner maintenance of three-ring release system:

- a. Disassemble the system every month to clean the cable and massage the ends of the risers.
  - (1) Nylon riser webbing develops a memory, especially when dirty.
  - (2) When disassembled, twist and massage the nylon webbing around the two riser rings.



- b. Clean the cables:
  - (1) Most three-ring release cables develop a sludge-like coating that causes them to bind, increasing the required pull force.
  - (2) Refer to the manufacturer's instructions for cleaning.
- 2. Use the correct stow bands for each type of lines:
  - a. Smaller lines require the smaller bands.
  - b. Larger bands may be required for larger lines.
  - c. Line stow bands should grasp the line stow bights tightly, resulting in six to 11 pounds of force to extract.
  - d. Replace each stow band as it stretches, wears, or breaks.
- 3. Main closing loop:
  - a. Damage greater than ten percent warrants replacement.
  - b. Tension:
    - (1) Tension must be sufficient to keep the container closed in freefall.
    - (2) The closing pin should require eight to 11 pounds to extract (or check owner's manual).
    - (3) A loose closing loop could result in a premature deployment.
    - (4) Freeflying maneuvers increase the importance of closing system security.
    - (5) Adjust the closing loop tension by moving the overhand knot or replacing the loop with the knot tied in the correct place.
  - c. Use only closing loop material approved by the harness and container manufacturer.

## **Spotting and Aircraft**

- 1. Overview of aircraft radio use requirements:
  - a. The jump aircraft must have an operating radio for jumping to take place.
  - b. The pilot must be in contact with air traffic control prior to jumping.
- 2. FAA notification required before a jump:
  - a. A jumper or the pilot must notify the appropriate air traffic control facility at least one hour prior to jumping (no more than 24 hours prior) in most airspace.
  - b. Some drop zones have a written notification renewed annually for that location only.
- 3. Aircraft approved for flight with door removed:
  - a. Some aircraft are unsafe for flight with the door open or removed.
  - b. Aircraft approved for flight with the door removed may require additional modifications and usually require additional FAA field approval.
  - c. Other modifications to a jump aircraft, e.g., in-flight doors, hand holds, or steps, require additional field approval or a supplementary type certificate.
  - d. Review with the pilot the certificates of approval for modifications on the jump aircraft.





## **Exit and Freefall**

### 1. Diving exit:

- a. Position yourself in the door to place your hips and chest into the air coming from ahead of the aircraft, with your body oriented side-to-earth.
- b. Exit in a neutral body position to arrest your forward throw from the aircraft, which is moving you away from your coach.
- c. Before starting to dive, hold the neutral body position for two to three seconds while slowly turning toward your coach.
- d. Use a delta position to begin diving toward your coach.

### 2. Using your spine to adjust dive angle:

- a. Initiate the swoop with your legs fully extended.
- b. Follow the person ahead closely, but be prepared to slow rapidly.
- c. Pitch up or down by curving your spine to increase or flatten the angle of the dive.
- d. Use fast- and slow-fall technique to adjust vertical position relative to the diver ahead.
- e. For safety and to prevent a collision, dive with an escape path in mind.

### 3. Traffic on approach to the formation:

- a. Dive in a straight line.
- b. Prevent collisions by watching for other jumpers while on approach to the formation.

### 4. Start, coast and stop:

- a. Once you are about halfway to the target, return to a more neutral position.
- b. You can increase your speed to the target if you find you have slowed too soon.
- c. Use a flare position (arms forward) to slow and stop at a position level and 10-20 feet away from the target; visual cues:
  - (1) Back pack in view: approaching too high.
  - (2) Front of harness in view: approaching too low.
- d. Begin a level approach using legs only.
- e. Remain aware of traffic to each side and for errant jumpers below the approach path.

### 5. Rapidly arresting forward movement (very effective):

- a. Extend both arms forward.
- b. Use slow-fall technique (cup sternum and abdomen).
- c. Drop both knees.

### 6. Breaking off and tracking:

- a. Plan break-off altitude high enough for the jumper with the least experience to track to a safe distance from the formation, at least 100 feet for groups of five or fewer (minimum distance required for A license check dive).



b. Break off:

- (1) The minimum break off altitude recommendations for group freefall in SIM Section 6-1 apply to very experienced formation skydivers jumping at a familiar location, using familiar equipment, and jumping with familiar people.
  - i. Groups of five or fewer, break off should be 1500 ft higher than the highest planned deployment altitude in the group.
  - ii. Groups of six or more, break off should be at least 2000 ft higher than the highest planned deployment in the group.
  - iii. Break offs higher than these recommendations should be considered for groups; with lower experienced jumps; freeflying; involving props or special equipment (flags, smoke, banners, hoops; etc.); bad spots recognized in freefall; and jumps with other special considerations.
- (2) If any of these conditions are not met, add 500-1,000 feet to your planned break off.

c. Develop techniques to scan and steer clear of other jumpers ahead and below.

d. Look sideways and above for other jumpers in the immediate area during wave-off and deployment so you can steer clear under canopy as soon as you open.

## **Emergency Procedure Review**

1. Refer to SIM Section 6-5 for "Water Landing Recommendations."

2. Water hazards:

- a. Definition of a water hazard. (SIM Section 2-1)
- b. Flotation devices:
  - (1) Are required for some jumpers; refer to the BSRs on Parachute Equipment
  - (2) Are recommended for jumpers using ram-airs when jumping within a mile of water
- c. Adjust the planned spot to avoid bodies of water.

3. Procedures for an unintentional water landing. (SIM Section 5-1)

4. Recovery from a turn made too low. (SIM Section 5-1)

## **Canopy**

1. Using front risers:

- a. Front risers may be used to dive the canopy:
  - (1) To lose altitude rapidly.
  - (2) To maintain position over ground in strong winds.
  - (3) To catch up with another jumper under canopy below.
  - (4) To have fun.
- b. Heading control with front risers depends on:
  - (1) Airspeed.
  - (2) The rate of turn.
  - (3) The speed of turn entry.
- c. Heading control with front risers takes practice to become predictable.
- d. Practice heading control with front-risers:
  - (1) Pull both front risers down to dive straight ahead.
  - (2) Pull one front riser to complete two 90-degree and two 180-degree turns.



- e. Initiate a sharp, deep front-riser turn, raise the riser slightly to decrease the turn rate, and then pull the riser fully down again to attempt to increase the rate of the turn:
  - (1) The rate of turn may not increase.
  - (2) The resistance on the riser may make it too difficult to pull the riser down farther after raising it.
  - (3) This exercise demonstrates the different nature of front-riser heading control.
- f. Complete all front-riser maneuvers by 1,000 feet.

2. Front riser safety:

- a. Watch for traffic below and to the sides prior to initiating a front-riser dive.
  - b. Front riser maneuvers can be very dangerous near the ground:
    - (1) Turbulence may affect canopy heading or descent rate.
    - (2) A mishandled front-riser turn can lead to an undesirable heading, e.g., towards an obstacle, without time to complete the turn safely before landing.
    - (3) A crowded landing pattern is never the place for high-speed maneuvers.
  - c. Keep both steering toggles in hand when performing front-riser maneuvers to make heading changes more reliably and quickly if necessary.
3. Perform the remaining unassisted landings within 20 meters of the planned target to meet the USPA A license requirements. (Total of five required for A license).



## Category H Quiz

(Must be passed before Category H jumps)

- 1) Why is it important to look ahead during a swoop toward other jumpers in freefall?**
  - a) To maximize your speed.
  - b) To maintain heading.
  - c) To see others and avoid a collision.
- 2) What is the fastest way to slow down from a freefall swoop approach?**
  - a) Aggressive arch.
  - b) Neutral body position with arms forward and knees down.
  - c) Arms back at waist and legs straight.
- 3) What is the danger of a loose or worn main container closing loop?**
  - a) Premature deployment.
  - b) AAD fire.
  - c) Line over malfunction.
- 4) Why must three-ring release cables be cleaned periodically?**
  - a) Oxidation will cause microscopic burrs on metal which could tear fabric.
  - b) To remove tar.
  - c) Corrosion deposits cause them to bind.
- 5) If you see that you have begun to turn too low to the ground for a safe landing, what should be your first response?**
  - a) Quickly use toggle controls to turn in the opposite direction.
  - b) Neutralize the turn and get the canopy overhead.
  - c) Prepare to PLF.
- 6) What effect does pulling on the front risers have on the canopy?**
  - a) Dramatic increase in rate of descent.
  - b) Dramatic decrease in rate of descent.
  - c) Dramatic increase in forward speed.
- 7) When performing front riser maneuvers, what should you do with the toggles?**
  - a) Stow them.
  - b) Keep them away from the front risers.
  - c) Keep them in your hands.
- 8) What are the two biggest dangers of front-riser maneuvers near the ground?**
  - a) Collisions with other jumpers and collision with the ground.
  - b) Broken lines and collision with the ground.
  - c) Canopy stalls and collision with the ground.
- 9) What are some of the possible results of a turn made too low to the ground?**
  - a) Horseshoe malfunction.
  - b) Serious injury or death.
  - c) Increased chance of landing on target.



**10) What is the procedure for landing in water?**

- a) Inflate flotation device, disconnect chest strap and RSL, prepare for PLF, face into wind, flare, hold breath, cut away once feet are wet, remove leg straps, swim upwind; if under the canopy, dive deep and swim away or follow one seam until out from underneath.
- b) Inflate flotation device, disconnect chest strap and RSL, prepare for PLF, face into wind, flare, hold breath, cut away five to ten feet above water, remove leg straps, swim upwind; if under the canopy, dive deep and swim away or follow one seam until out from underneath.
- c) Inflate flotation device, prepare for PLF, face into wind, flare, hold breath, remove leg straps, swim upwind; if under the canopy, dive deep and swim away or follow one seam until out from underneath.

**11) What is the maximum percentage of visible wear allowable on a main closing loop?**

- a) Fifty percent
- b) Twenty-five percent
- c) Ten percent

**12) Can a jump be legally made from an aircraft without an operating radio?**

- a) No
- b) Yes
- c) Yes, as long as the aircraft has an operating GPS system.

**13) What is the least notification the FAA requires before any jump or series of jumps may be made?**

- a) Twenty-four hours
- b) One hour
- c) One month

**14) Where can a pilot look to determine if a plane is approved for flight with the door removed?**

- a) No approval is needed.
- b) AC 105.2, Appendix 2, or aircraft owner's manual.
- c) FAR 105.3

**15) Whose name will the FAA require when filing a notification for parachute jumping?**

- a) The person giving notice.
- b) The local safety and training advisor.
- c) The pilot.



## Category H-1 & H-2 Dive Flows

One AFF Instructor or Coach

### Freefall Dive Flow

- Exit from the door one second after the coach.
- Present belly to wind in a neutral body position and maintain it for two seconds.
- Coach establishes fall rate and holds heading.
- Turn toward coach.
- Dive and stop level 10 to 20 feet out.
- Altitude check every five seconds.
- Approach and take grips.
- Altitude permitting, coach dives to a point 50 to 100 feet laterally and 20 to 40 feet below.
- Follow and repeat docking procedure.
- Break off at 5,000 feet.
- Coach remains in place and evaluates track.
- Wave off and deploy by 3,000 feet.

### Canopy Dive Flow

- Check altitude, position, and traffic.
- Perform an on-heading front riser dive (keep toggles in hand).
- Check altitude, position, and traffic.
- Perform a 90-degree front riser turn (keep toggles in hand).
- Check altitude, position, and traffic.
- Perform a 180-degree front riser turn (keep toggles in hand).
- Check position and altitude.
- Enter a front riser turn, let up halfway and begin the turn again (keep toggles in hand).
- Complete all front riser maneuvers by 1,000 feet.
- Follow planned pattern over landing area or alternate.
- Prepare to PLF and flare to land.
- Coach measures your landing distance from a planned target.

## Advancement Criteria

### **Exit and Freefall**

- Two swoop and docks with minimum assistance.
- Break off at the planned altitude without prompting.
- Track 100 feet within ten degrees of the planned heading.

### **Canopy**

- Two cumulative 90-degree front-riser turns.
- Two cumulative 180-degree front-riser turns.
- Total of five unassisted landings within 20 meters of the target (A-license requirement).

### **Equipment**

- Disassemble, perform owner maintenance, and reassemble three-ring release system.
- Remove and replace or adjust a main container closing loop.



# USPA A-License

## License Exam Guidelines

1. The examining USPA Instructor conducts a written or oral quiz of at least 20 questions taken from the USPA Integrated Student Program syllabus, with emphasis on the following:
  - a. Cloud clearance and visibility requirements.
  - b. Equipment operation and maintenance:
    - (1) Wing loading and its effects.
    - (2) Closing loop.
    - (3) Velcro and tuck flaps.
    - (4) Packing and authorization to pack.
  - c. Canopy flight:
    - (1) Traffic patterns and collision avoidance.
    - (2) Braked turns and obstacle avoidance.
    - (3) Low turn avoidance and recovery.
    - (4) Downwind landing procedures.
    - (5) Obstacle landing emergency and recovery procedures.
  - d. Aircraft procedures:
    - (1) During jump run and exit to observe balance limits.
    - (2) Distance between groups to maintain separation.
    - (3) Aircraft emergency procedures.
  - e. Group break off recommendations.
  - f. Parachute emergency procedures:
    - (1) Deployment malfunctions.
    - (2) Cutaway decide-and-act altitude.
    - (3) Two-canopies-deployed scenarios.
  - g. Accountability for FAR compliance.
2. The examining USPA Instructor conducts or arranges the review training required for the student to answer all questions correctly.
3. The examining USPA Instructor conducts a skydive with the applicant to verify practical knowledge in the following areas:
  - a. Choosing the spot and selecting and guiding the pilot to the correct exit and opening point in routine conditions.
  - b. Pre-jump equipment checks for self and others.
  - c. Planning an effective group break-off.
  - d. Right 360° turn, left 360° turn, and a back loop (back loop to be completed within 60°s of the original heading).
  - e. Docking from 20 feet (USPA Instructor flies into position).
  - f. Break off altitude recognition and tracking for a minimum of 100 feet.
  - g. Signal before deployment and overall awareness during and after deployment.
  - h. Planning and flying a logical landing pattern that promotes a smooth traffic flow and avoids other jumpers.
  - i. Packing and preparing equipment for the next jump.

4. Once the student has successfully completed the A-license check dive and answered all questions correctly on the exam, the certifying USPA Instructor may sign the student's A License Proficiency Card or the approved equivalent and apply the official USPA A-license stamp as proof of license qualification.

## **A License Check Dive**

Must be conducted by an AFF Instructor

- Student spots aircraft and verifies exit point with instructor.
- Exit position optional.
- Demonstrate a 360° turn to the right, a 360° left, and a back loop.
- Instructor moves 20 feet from the candidate and on level.
- Student docks on instructor.
- Initiate break off, turn and track a minimum of 100 feet within 30°.
- Wave off and pull by 3,000 feet.
- Follow planned pattern over landing area or alternate.
- Prepare to PLF and flare to land.

## **Presenting a Completed A License Proficiency Card**

1. The completed A License Proficiency Card signed by the certifying USPA Instructor and bearing the official A License stamp, is proof of a USPA A License.
2. An A license holder may permanently register the license with USPA by sending a copy with the appropriate license registration fee:
  - a. Fax both sides of the completed license application to USPA with a credit card authorization.
  - b. Photocopy both sides of the completed license application and mail it with payment.
  - c. A completed and signed A-License application need not be stamped to be registered with USPA. (USPA keeps a copy of all USPA Instructor signatures on file); however, an A License Proficiency Card is not considered official unless stamped or until a license number is issued.





## USPA A LICENSE PROGRESSION CARD AND APPLICATION

Name \_\_\_\_\_ USPA # \_\_\_\_\_  
(or enclose new membership application)  
Address \_\_\_\_\_  
City, State, and Zip \_\_\_\_\_  
Telephone \_\_\_\_\_  
E-Mail \_\_\_\_\_  
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### CATEGORY A

FJC Date \_\_\_\_\_ Meth. \_\_\_\_\_  
Adv. Criteria Instructor Lic.# \_\_\_\_\_  
• Aircraft and exit safety \_\_\_\_\_  
• Safe exit \_\_\_\_\_  
AFF AND TANDEM ONLY  
• Overall FF awareness \_\_\_\_\_ Date \_\_\_\_\_ I \_\_\_\_\_  
• Stable for last 10 secs. \_\_\_\_\_  
• Altitude aware \_\_\_\_\_  
• Asst. pull w/in 1,000' \_\_\_\_\_  
• Land 60 deg. w/asst. \_\_\_\_\_  
• Land 100m w/asst. \_\_\_\_\_  
• Category quiz Date \_\_\_\_\_ I \_\_\_\_\_

### Solo transition course (from tandem)

Date \_\_\_\_\_ Method \_\_\_\_\_ Instructor \_\_\_\_\_  
(may be completed after Category A or B)

### CATEGORY B

Exit and Freefall Date \_\_\_\_\_ I \_\_\_\_\_  
Canopy Date \_\_\_\_\_ I \_\_\_\_\_  
Emerg. Review Date \_\_\_\_\_ I \_\_\_\_\_  
Equipment Date \_\_\_\_\_ I \_\_\_\_\_  
Spot. and A/C Date \_\_\_\_\_ I \_\_\_\_\_  
Adv. Criteria Instructor Lic.# \_\_\_\_\_  
• Stable throughout \_\_\_\_\_  
• Leg control \_\_\_\_\_  
AFF AND TANDEM ONLY  
• Solo pull w/in 500' \_\_\_\_\_  
STATIC LINE AND IAD ONLY  
• 3 successive practice pulls \_\_\_\_\_  
• Descent strategy \_\_\_\_\_  
• Clearing before turns \_\_\_\_\_  
• Land 30 deg. w/asst. \_\_\_\_\_  
• Asked to join USPA \_\_\_\_\_  
• Category quiz Date \_\_\_\_\_ I \_\_\_\_\_

### CATEGORY C

Exit and Freefall Date \_\_\_\_\_ I \_\_\_\_\_  
Canopy Date \_\_\_\_\_ I \_\_\_\_\_  
Emerg. Review Date \_\_\_\_\_ I \_\_\_\_\_  
Equipment Date \_\_\_\_\_ I \_\_\_\_\_  
Spot. and A/C Date \_\_\_\_\_ I \_\_\_\_\_  
Adv. Criteria Instructor Lic.# \_\_\_\_\_  
• Control w/in 5 secs. \_\_\_\_\_  
• Relaxed fall \_\_\_\_\_  
• FF heading awareness \_\_\_\_\_  
• Wave-off \_\_\_\_\_  
• FF w/one I (AFF) \_\_\_\_\_  
• Solo pull at correct alt. \_\_\_\_\_  
• Plan pattern for wind \_\_\_\_\_  
• Fly pattern w/min. asst. \_\_\_\_\_  
• Flare w/min. asst. \_\_\_\_\_  
• Category quiz Date \_\_\_\_\_ I \_\_\_\_\_

### Official USPA A-license stamp:

This stamp and signature of a USPA Instructor or I/E, verifies that the applicant has completed all qualifications for the USPA A license and performed satisfactorily on the USPA A-license check dive. This temporary USPA A license expires with the holder's USPA regular membership or when replaced by any registered license issued from USPA Headquarters.

Valid only when  
stamped. (Stamp  
not required for  
registration at USPA  
Headquarters.)

### A-LICENSE CHECK DIVE

License Requirement Instructor Lic. #  
• Check dive with USPA Instructor (See SIM Sec. 3-2.A.1.c)  
• 25 skydives  
• A-license exam  
• Joined USPA

All blocks on this record must be initialed or signed as indicated.

#### Application instructions:

Photocopy both sides of this complete record and mail to USPA (or fax original form) with \$30 to register your USPA A license. You will receive a new membership card verifying your permanent license number. Keep this document in a safe place.

Include your USPA number after your name on page 1, or complete a USPA membership application and submit your membership dues.

Enclose a check for license registration fee, or fax with your valid Visa or MasterCard number:

\$ \_\_\_\_\_ License Fee (\$30)  
\$ \_\_\_\_\_ Expedite with fax or e-mail confirmation (\$20)  
Fax # or e-mail address \_\_\_\_\_  
\$ \_\_\_\_\_ Total

☐  ☐  Foreign payments must be with VISA or MasterCard.

Instructor's Name \_\_\_\_\_  
Signature \_\_\_\_\_ Date \_\_\_\_\_  
USPA # \_\_\_\_\_  
Drop Zone Name \_\_\_\_\_  
Applicant's Signature \_\_\_\_\_  
MO \_\_\_\_\_ YR \_\_\_\_\_  
expiration date

This official document is your temporary license. Please do NOT send the original to USPA. Send a photocopy or fax the complete original.



Mail photocopy to:  
U.S. Parachute Association  
5401 Southpoint Centre Blvd.  
Fredericksburg, VA 22407

Or fax original to:  
(540) 604-9741



**CATEGORY D**

<b>Exit and Freefall</b>	Date _____	I _____	_____
<b>Canopy</b>	Date _____	I _____	_____
<b>Emerg. Review</b>	Date _____	I _____	_____
<b>Equipment</b>	Date _____	I _____	_____
<b>Spot. and A/C</b>	Date _____	I _____	_____
<b>Adv. Criteria</b>	<b>Instructor</b>	<b>Lic.#</b>	_____
• Solo exit, stable w/in 5 secs.	_____	_____	_____
• 90-degree FF turns w/in 20 degrees (4)	_____	_____	_____
• 180-degree FF turns w/in 45 degrees (2)	_____	_____	_____
• 360-degree FF turns w/in 45 degrees (2)	_____	_____	_____
• Observe jump run	_____	_____	_____
• Category quiz	_____	Date _____	I _____

**Note:**

**Prior to freefall self-supervision** (typically after the first jump in Category E), all students must meet the standards listed in the USPA BSRs. Clearance to freefall self-supervision requires the endorsement of an appropriately rated USPA Instructor (signature in logbook). Under the supervision of a USPA Instructor, a USPA Coach may train only the freefall portions of Categories E-H.

**CATEGORY E**

<b>Exit and Freefall</b>	Date _____	C/I _____	_____
<b>Canopy</b>	Date _____	I _____	_____
<b>Emerg. Review</b>	Date _____	I _____	_____
<b>Equipment</b>	Date _____	R/I _____	_____
<b>Spot. and A/C</b>	Date _____	I _____	_____
<b>Adv. Criteria</b>	<b>Instructor</b>	<b>Lic.#</b>	_____
• Stability recovery w/in 5 secs. (2)	_____	_____	_____
• Jump without FF supervision	_____	_____	_____
• Barrel roll	_____	_____	_____
• Backloop	_____	_____	_____
• Frontloop	_____	_____	_____
• Land w/o asst. w/in 50m	_____	_____	_____
• Calculate opening point	_____	_____	_____
• Participate w/jump run	_____	_____	_____
• Category quiz	_____	Date _____	I _____

**CATEGORY F**

<b>Exit and Freefall</b>	Date _____	C/I _____	_____
<b>Canopy</b>	Date _____	I _____	_____
<b>Emerg. Review</b>	Date _____	I _____	_____
<b>Equipment</b>	Date _____	I _____	_____
<b>Spot. and A/C</b>	Date _____	I _____	_____
<b>Adv. Criteria</b>	<b>Instructor</b>	<b>Lic.#</b>	_____
• Tracking sequence w/in 30 degrees (3)	_____	_____	_____
• Clear and pull (5,500')	_____	_____	_____
• Clear and pull (3,500')	_____	_____	_____
• Pack w/asst.	_____	_____	_____
• Check other jumper's gear	_____	_____	_____
• Select spot	_____	_____	_____
• Spot w/min. asst.	_____	_____	_____
• Category quiz	_____	Date _____	I _____

**CATEGORY G**

<b>Exit and Freefall</b>	Date _____	C/I _____	_____
<b>Canopy</b>	Date _____	I _____	_____
<b>Emerg. Review</b>	Date _____	I _____	_____
<b>Equipment</b>	Date _____	R/I _____	_____
<b>Spot. and A/C</b>	Date _____	P/I _____	_____
<b>Adv. Criteria</b>	<b>Instructor</b>	<b>Lic.#</b>	_____
• Redock from 10' w/o asst. (2)	_____	_____	_____
• Redock w/ adj. fall rate (2)	_____	_____	_____
• Break-off at alt. w/o prompt	_____	_____	_____
• Track 50' w/in 10 degrees	_____	_____	_____
• Reverse canopy turns (4)	_____	_____	_____
• Land 20m w/o asst. (2)	_____	_____	_____
• Pack w/o asst.	_____	_____	_____
• Spot w/o asst.	_____	_____	_____
• Category quiz	_____	Date _____	I _____

**CATEGORY H**

<b>Freefall</b>	Date _____	C/I _____	_____
<b>Canopy</b>	Date _____	I _____	_____
<b>Emerg. Review</b>	Date _____	I _____	_____
<b>Equipment</b>	Date _____	R/I _____	_____
<b>Spot. and A/C</b>	Date _____	P/I _____	_____
<b>Adv. Criteria</b>	<b>Instructor</b>	<b>Lic.#</b>	_____
• Swoop and dock w/min. asst. (2)	_____	_____	_____
• Break-off at alt. w/o prompt	_____	_____	_____
• Track 100' w/in 10 degrees	_____	_____	_____
• 90-degree front riser turns (2)	_____	_____	_____
• 180-degree front riser turns (2) <i>(Front riser turns may be waived if no difficulty)</i>	_____	_____	_____
• Land 20m w/o asst. (3)	_____	_____	_____
• Replace closing loop	_____	_____	_____
• Assemble 3-ring	_____	_____	_____
• Category quiz	_____	Date _____	I _____



## Section 4-I—Student Skill and Knowledge Sets

Jump Numbers and Supervision	Exit and Freefall	Canopy Flight	Equipment	In-Depth Emergency Review*	Rules and Recommendations	Spotting and Aircraft
AFF: 1 (Two AIs) SL/IAD: 1-2 (S/I I) Tan: 1 (TI)	Adaptation to skydiving environment; principles of deployment	Steering; intro pattern; wind line; landing procedures	Altimeter and operation handle orientation; instructor gear checks	Passive aircraft emergencies (instructor leads)	FAR 91.107 (seat belts); SIM 2-1 (first-jump course topics)	Propeller avoidance; movement in aircraft
AFF: 2 (Two AIs) SL/IAD: 3-5 (S/I I) Tan: 2-3 (TI)	Relaxed body position; leg awareness; unassisted stable deployment (simulated for SL/IAD)	Assisted pattern; assisted flare; written flight plan; review PLF	Handle operation and protection	Training harness: deployment problems; partial and total malfunctions; stability recovery; and altitude awareness	SIM 2-1 (students); SIM 5-1 (malfunctions); FAA AC-90-66A (illustration of aircraft traffic patterns)	Airport orientation and recognition; runway and approach incursions; aircraft patterns
AFF: 3-4 (Two AIs, then one) SL/IAD: 6-8 (S/I I) Former Tan: 4-5 (AI)	Solo controlled and relaxed fall; heading maintenance; wave-off	Solo pattern and flare; wing loading; downwind landings	Complete orientation (main closed); observe pre-flight	Open parachute in aircraft; off-airport landings; obstacle recognition and avoidance; turbulence; collapsing the canopy on landing	SIM 2-1 (student equipment); FAR 105.43.b.1 (equipment); local laws; canopy owner's manual	Pattern selection
AFF: 5-6 (AI) SL/IAD: 9-12 (S/I I) Coach Former Tan: 6-7 (AI)	Solo exit (AFF); heading control; freefall speeds and times	Back-riser control with and without brakes; stand-up; 50 meters assisted	Assisted pre-flight; AAD operation; AAD owner's manual	Training harness: routine opening problems; instant recognition and response; building landings	SIM 5-1 (buildings); SIM 5-3 (AADs); FAR 105.17 (clouds)	Jump run observation; looking below for aircraft
AFF: 7-9 (AI) until cleared from AFF, then Coach SL/IAD: 13-15 (S/I I) Coach (Merge tandem)	Door exit; aerobatics; unsupervised freefall	Stalls; traffic avoidance; 50 meters unassisted; the "sweet spot;" rectangular v. elliptical	Complete orientation (open canopy); component identification; unassisted pre-flight; comprehensive RSL	Training harness: two canopies out; high-wind landings; independent aircraft emergencies	SIM 2-1 (winds); 2-1.L (oxygen); 5-1 (dual deployments); 5-3 (RSLs); 5-3 (altimeters); FAR 91 (pilot responsibilities); FAR 105.43.a and b (packing authorization and interval)	Aircraft orientation; airspeed; weight and balance; winds aloft; intro spot selection; assist with jump run
AFF: 10-13 SL/IAD: 16-17 Coach	Tracking; two clear and pulls for former AFF students	Braked turns, approach, and landing; maximum glide; 25 meters on two jumps	Assisted packing; pin check (others); parachute system and canopy owner's manuals	Power line landings	SIM 2-1 (all); 3-1 (all); 5-1 (power lines); 5-2 (recurrency recommendations; 5-7 (group separation); parachute system and reserve owner's manuals	Group separation; assisted jump run; calculating exit point from winds aloft
AFF: 14-17 SL/IAD: 18-21 Coach	Group exits; forward motion; rate of descent; docking; break-off and separation	Collision avoidance review; reverse turns; 20 meters on two jumps	Solo packing; rigger's responsibilities; maintenance orientation; AAD review	Canopy collision response; tree landings	SIM 5-1 (trees); 5-1 (collisions); SIM 5-5 (weather); 6-1 (group freefall); FAR 105.43.c (AAD maintenance)	Unassisted jump run; weather
AFF: 18-21 SL/IAD: 22-25 Coach	Diver exit; swooping; traffic awareness during swooping, tracking and deployment	Front riser control; 20 meters on three jumps	Owner maintenance (three-ring, closing loop)	Water landings; low-turn recovery	SIM 5-1 (water); 5-1 (low turns); 6-2 (breakoff); FAR 105.13 (aircraft radio); 105.15 (notification); AC 105-2C App. (aircraft)	Notification to FAA of jump activity; review STC, 337, etc.

\*After training recommended in the USPA Integrated Student Program for solo students coming from tandem.



## Hand Signals



Check Arms (Verify 90° angle at elbow and shoulder)



Extend Legs  
(4"-6", slow and smooth)

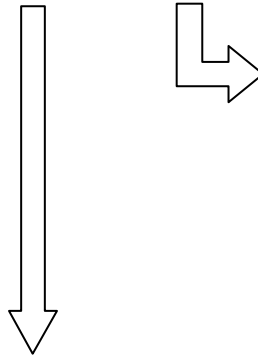


Bend Legs  
(4"-6", slow and smooth)



Circle of Awareness  
(Check Altitude)

Note: If your instructor(s) is shaking you immediately after exit, Arch and Relax



Arch  
(Push Pelvis Forward)



Relax  
(Breathe)



Bring Knees Together or  
Toe Taps

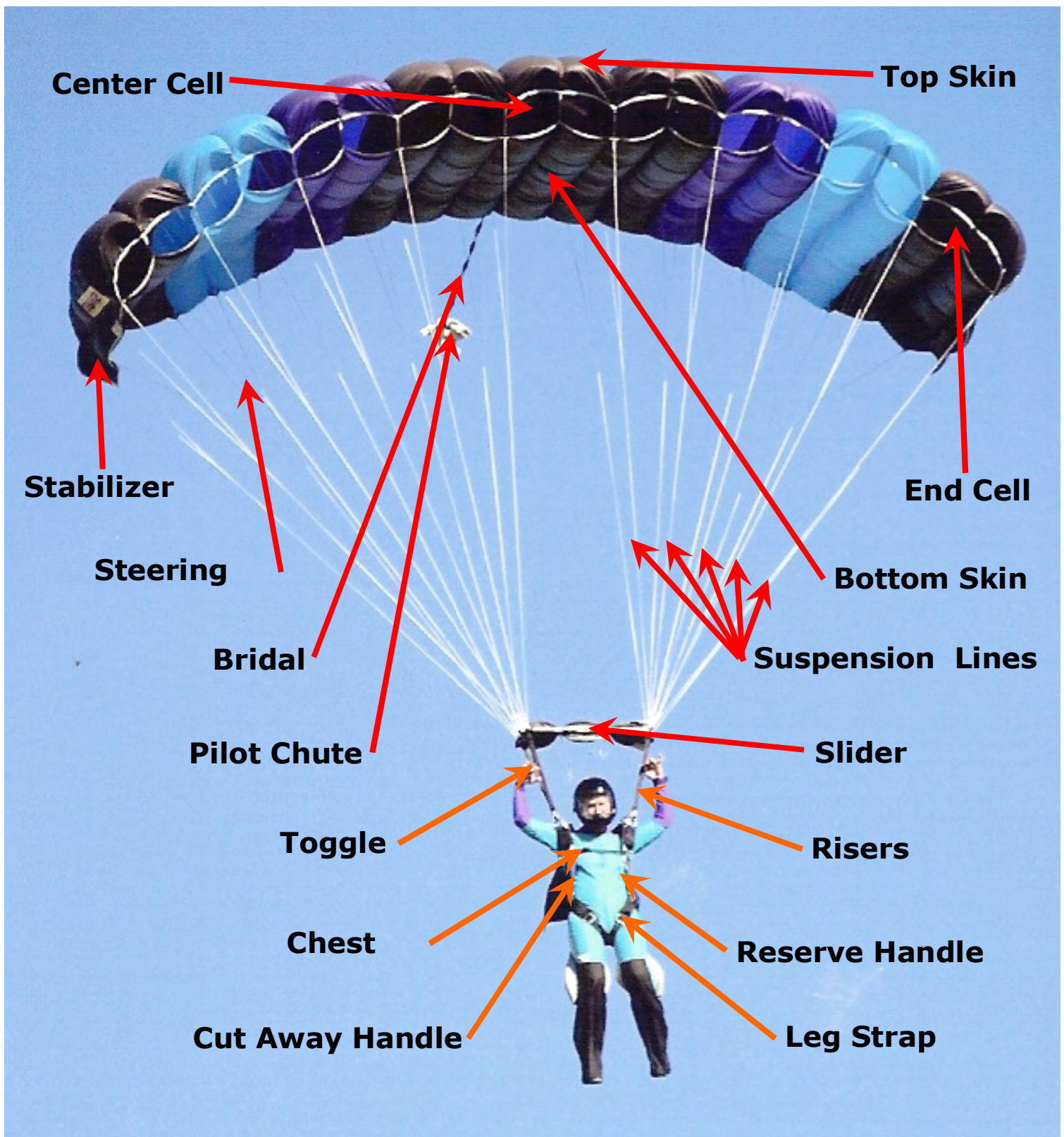


Practice Pilot Chute  
Touches



Pull  
(Immediately)





Jumper: Tristan Donley  
Photo By: Mike Ashley



*The Middletown Regional Airport runway is oriented 050°-230° (NE-SW) and is 6100 ft. in length.*



# FREEFALL TIME TABLE

Exit Altitude (feet) with opening at 3,000'	Length of freefall (feet)	TIME OF FREEFALL (WITH GIVEN TERMINAL VELOCITY)		
		120 mph (horizontal)	160 mph (vertical)	50 mph (wing suit)
3,500	500	6	5	10
4,000	1,000	9	7	17
4,500	1,500	12	9	24
5,000	2,000	15	12	31
5,500	2,500	18	14	37
6,000	3,000	21	16	44
6,500	3,500	24	16	51
7,000	4,000	26	18	58
7,500	4,500	29	23	65
8,000	5,000	32	25	71
8,500	5,500	35	27	78
9,000	6,000	38	29	85
9,500	6,500	41	31	92
10,000	7,000	43	33	99
10,500	7,500	46	35	105
11,000	8,000	49	38	112
11,500	8,500	52	40	119
12,000	9,000	55	42	126
12,500	9,500	58	44	133
13,000	10,000	60	46	140
13,500	10,500	63	48	146
14,000	11,000	66	50	153
14,500	11,500	69	52	160
15,000	12,000	72	55	167
15,500	12,500	74	57	174

# Glossary

## A

**AAD:** (see **Automatic Activation Device** )

**A License:** The first level license which signifies that a skydiver has advanced beyond the student phase. Persons holding a USPA A License are able to jumpmaster themselves, perform basic group freefall jumps and water jumps, participate in certain USPA collegiate competition events, and pack their own main parachute.

**Accelerated Freefall (AFF), USPA:** Harness-hold freefall skydiving student training discipline developed under Ken Coleman and adopted by USPA. AFF-rated USPA Instructors accompany the student in freefall during the initial training jumps.

**AGL:** Above ground level. Refers to altitude, e.g., 5,000 feet AGL.

**Aircraft:** Any machine or device, including airplanes, helicopters, gliders, balloons, etc., capable of atmospheric flight. For the purposes of regulation, parachutes are not considered aircraft.

**Air Speed:** The speed of an airborne aircraft or parachute, relative to the air.

**Alterations:** Any change or modification to any part of the parachute assembly from its original manufacturer's specifications. (See also **Major alteration** and **Minor Alteration**)

**Altimeter:** A device that measures height above the surface (altitude); for skydivers, typically above the intended skydiving landing area. (See also **Audible Altimeter**)

**Angle of Incidence:** The relative pitch (leading edge up or down) angle of a wing measured between the chord line and the horizon.

**Angle of Attack:** The relative pitch (leading edge up or down) angle of a wing measured between the chord line and the relative wind.

**Approach angle:** (See **glide path**)

**Appropriately Rated:** adj. Refers to a USPA Instructor or Instructor Examiner rated in the method-specific instructional discipline necessary to perform a particular task in accordance with the BSRs.

**Arch :** n. Position skydivers use to orient the front of their torso to the relative wind. Described, it is hips forward with back arched; legs extended to 45 degrees, toes pointed; knees at shoulder width; arms bent 90-120 degrees at the shoulders and elbows and relaxed; head up.

**Artistic Events:** Skydiving competition events that include freeflying, freestyle skydiving, and skysurfing.

**AS 8015 (Aerospace Standard 8015):** Standard of tests and minimum safety and performance requirements which must be met to receive approval under technical standard order (TSO) certification. AS 8015A, the standard for TSO C-23c was adopted in 1984 to supersede NAS 804, the standard for TSO C-23b. In June, 1994, AS 8015B became the standard for TSO C-23d.

**Audible Altimeter:** An alarm used by skydivers to alert them about reaching one or more pre-set altitudes.

**Auxiliary Parachute:** (See reserve parachute.)

**Automatic Activation Device (AAD):** A self contained mechanical or electro-mechanical device that is attached to the interior of the reserve parachute container, which automatically initiates parachute deployment of the reserve parachute at a pre-set altitude, time, percentage of terminal velocity, or combination thereof. (FAR 105 definition)

## B

**B-12s:** (jar.) Clip hardware sometimes used for leg-strap attachment on a parachute harness. Refers generally to the MS 22044 hardware originally used on the U.S. Army B-12 parachute assembly. (See **Thread-Through**)

**B License:** The second level USPA license. Persons holding a USPA B License are authorized to participate in the USPA collegiate 4-way formation skydiving event, perform night jumps, and when qualified, apply for a USPA Coach rating.





**Bag:** n. (See **Deployment Device**)

**Bag Lock:** A malfunction of a deployed parachute where the canopy remains in the deployment bag.

**B.A.S.E. Jumping:** An activity involving the use of a parachute for descent from fixed objects. The acronym derives from the first initials of four possible launch categories: buildings, antennae, spans (bridges), and earth (cliffs). Because BASE jumping does not meet the FAA's definition of "the descent of an object to the surface from an aircraft in flight," it is not regulated by the FAA or addressed by USPA.

**Base:** **1.** When building a freefall or canopy formation, the initial target individual or group of people to which the others fly. **2. Base (leg ):** The portion of the three-legged landing pattern where the jumper flies across the direction of the wind downwind of the landing area before turning for final approach into the wind toward the target.

**Basic Safety Requirements (BSRs), USPA:** Minimum standards overseen and published by USPA and generally agreed upon as the acceptable standard for safe skydiving activities. The BSRs form the foundation of self governing by skydivers. USPA oversees the BSRs.

**Belly Flying:** (See **Flat Flying**)

**Board of Directors (BOD). USPA:** Those representatives elected by the general members of USPA every two years as set forth in the USPA By-Laws; authorized by the by laws to have general charge and control of the affairs, funds, and property of the organization and to carry out the objectives of the organization and its by-laws; elects officers from among current USPA Board members. The USPA Board of Directors consists of: 1. National Directors—those directors elected at large by the general membership; 2. Regional Directors—those Directors of a specified geographical area, elected by and responsible for representing the interests of the skydivers in a USPA Region; and 3. An ex officio member representing the National Aeronautical Association.

**Braked Turn:** A turn under an open parachute canopy made by using the steering toggles to slow the forward speed of the canopy and then allow one side to fly slightly faster to change heading. Used to reduce altitude loss in a turn.

**Brakes:** **1.** The steering controls of a ram-air parachute. (See also **Toggles**) **2.** The position of the parachute steering controls, measured in relative increments (quarter brakes, deep brakes, etc.), to control speed and descent in a stable state of flight.

**Break off:** Procedure in group skydiving where jumpers cease group activity and separate. In freefall, jumpers begin to track at a predetermined altitude for a clear area to open safely; jumpers building canopy formations break off at a predetermined altitude to gain safe separation and allow jumpers to prepare for a landing approach. **2.** Act of a group of jumpers separating from a freefall or canopy group.

**Break off Altitude:** Planned altitude for initiating separation of jumpers during a group jump.

**Bridle:** The device, usually made of webbing or tape, connecting the pilot chute to the deployment bag or the canopy.

**BSRs:** (See **Basic Safety Requirements , USPA**)

## C

**C License:** The third level license issued by USPA. USPA C-license holders may apply when qualified for the USPA AFF, IAD, and Static-Line Instructor ratings, ride as passenger on USPA Tandem Instructor training and rating renewal jumps, and participate in intermediate-altitude jumps and open field and level 1 exhibition jumps.

**Canopy:** The major component of the parachute system comprised of fabric membranes that connect to the parachute harness by suspension lines and provide the means for the jumper to descend safely.

**Canopy Formation (CF); Canopy Relative Work ; (CRW):** n. **1.** The intentional maneuvering of two or more open parachute canopies in proximity to or in contact with one another during descent. **2.** The FAI competition discipline involving the building of canopy formations.

**Canopy Release:** A device which allows immediate separation of the parachute canopy and risers from the harness.

**Cascade:** The point where two or more lines of a canopy join into one.



**Cell:** Chordwise section of a parachute canopy between the load-bearing ribs. Sometimes, any portion of a canopy separated by vertical ribs.

**Certificated:** adj. Refers to FAA-approval status of parachute components, technicians (riggers), and aircraft pilots.

**Check of Threes:** Pre-jump equipment self-check performed in the aircraft: check three-ring release system (and RSL) for correct assembly; check three points of harness attachment for snap assembly or correct routing and adjustment; check three operation handles—main activation, cutaway, reserve—in place.

**Chord:** The longest dimension from the front to the back of a wing at any given point along the span.

**Cleared:** adj. Refers to a student who has received a signature from a USPA Instructor to advance.

**Climb out:** The act of a jumper positioning himself or herself in or near the door or on protuberances or structures outside the aircraft to prepare for launch, usually with a group.

**Closing Loop:** A lace that when threaded through eyelets in the parachute container flaps and locked with a closing pin, keeps the parachute contained until activation.

**Coach:** A non-rated operative who provides advanced skydiving training. (See also **Coach , USPA**)

**Coach, USPA:** The entry-level USPA instructional rating whose holder may teach the general (non-method-specific sections of the first-jump course) and conduct group freefall skills training and jumps with students, all under the supervision of a USPA Instructor.

**Collapsible Pilot Chute:** A hand-deployed pilot chute that automatically collapses after deployment.

**Collapsible Slider:** A slider rigged so the jumper can compress or wrap it to reduce drag (see also **Slider**).

**Container:** The portion of the parachute system that closes around and stores the folded parachute canopy and deployment device until deployment.

**Cork:** (jar.) During high-speed group freefall maneuvers, to lose control and decelerate rapidly. United states parachute association® publications glossary

**Cross Braced :** Refers to a canopy designed with longitudinal trussing between the vertical ribs to flatten and stiffen the wing in flight.

**Cross Connectors:** Straps attached between the risers. Used for canopy formation, they should be from front to rear only to prevent the docked jumper from sliding back up the lines. Especially important for plane formations. Also used with some reserve static-line systems and attached from side to side to prevent premature reserve deployment if only one riser is released.

**Crossport:** A vent cut into the structural rib of a parachute canopy to equalize air pressure between two cells.

**Crosswind:** Perpendicular to the direction of the wind.

**CREW:** (See **Canopy Formation**)

**Cutaway:** Procedure where the jumper releases from the main parachute prior to activating the reserve parachute. Used in the event of a main parachute malfunction to prevent an entanglement with the deploying reserve; in the event of a canopy entanglement with another jumper; and also in case the wind causes the canopy to drag a jumper after landing.

**Cutaway Handle:** Pillow or loop handle of a two handled system, normally located on the jumpers right-side chest, used to initiate a cutaway. Sometimes referred to as a three-ring release handle.

## D

**D License:** The fourth and highest level or license issued by USPA. USPA D-license holders may participate in all competitions at the national level, apply when qualified for all USPA instructional and proficiency ratings, and participate in high-altitude jumps.

**Delta:** Freefall position with legs extended and arms back to initiate a forward dive.

**Demonstration Jump (Demo):** (See **Exhibition Jump**)



**Density Altitude:** An expression of air density relative to standard atmospheric pressure at sea level. The pilot calculates pressure altitude and temperature and compares the result with an equivalent altitude MSL at standard temperature.

**Deployment:** After activation, extraction of the parachute from the container and full extension of the system prior to inflation.

**Deployment Device:** Intermediate container, usually a bag (D-bag) that contains or constricts the folded parachute through complete line deployment.

**Descent rate:** The downward horizontal speed of an aircraft or parachute, usually measured in feet per minute.

**Diaper:** A type of deployment device consisting of a fabric panel attached near the lower part of a canopy which prevents canopy inflation until full line stretch. Used frequently with round parachutes to reduce opening shock and malfunctions.

**Direct Supervision:** **1.** The attentive oversight of an activity taking place in the immediate presence of the supervisor, who is personally responsible for the proper conduct of the activity. (USPA definition) **2.** A certificated rigger personally observes a non-certificated person packing a main parachute to the extent necessary to ensure that it is being done properly, and takes responsibility for that packing. (FAR 105 definitions) (see also **Supervision**)

**Dive Blocks:** Hand grips (not loops) on the front risers to facilitate diving the canopy.

**Dive Loops:** Handles on the front risers to facilitate diving the canopy.

**Diver Exit:** Leaving an aircraft by diving out of the aircraft door; made without positioning or bracing to achieve a stable entry into the airstream.

**Dock:** To make physical controlled contact with another skydiver while in freefall; or, when building canopy formations, with another jumper's canopy.

**Door Exit:** (See **Diver Exit**)

**Downwind:** **1.** The direction toward which the air is moving. **2.** Positioned farther along the wind's path. **3.** A downwind-facing landing.

**Downwind leg:** The portion of the landing approach flown with the wind blowing from behind the jumper.

**Drogue:** A trailing drag device used to retard the movement of an object through the air, used in skydiving to regulate the fall rate of tandem skydivers.

**Drogefall:** In tandem skydiving, the portion of the descent where a drogue has been deployed between freefall and main parachute deployment.

**Drop Zone:** **1.** Skydiving establishment or intended parachute landing area. (USPA definition) **2.** Any predetermined area upon which parachutists or objects land after making an intentional parachute jump or drop. The center point target of a drop zone is expressed in nautical miles from the nearest VOR facility when 30 nautical miles or less; or from the nearest airport, town, or city depicted on the appropriate Coast and Geodetic Survey World Aeronautical Chart or Sectional Aeronautical Chart, when the nearest VOR facility is more than 30 nautical miles from the drop zone. (FAR 105 definition) (See also **Sanctioned Drop Zone**)

**Dual Assembly:** Refers to a two-canopy parachute system. Includes the main and reserve canopies, harness and container system, and all other components.

**Dummy Ripcord Pull (DRCP):** (see **Practice Deployment**)

**Dynamic Stall :** An action that occurs following the flare of a ram-air canopy, where the load (jumper) has swung forward under the canopy from the braking action and begins to swing back. (See also **Reverse Flight** and **Stall**)

## **E**

**Emergency Parachute:** A certificated parachute which is intended for emergency use; typically, the parachute a pilot wears.



**End Cell:** The last chordwise section of a parachute canopy on either end.

**End-Cell Closure:** Deflated end cell. Routine opening problem, usually correctable.

**Elliptical:** Refers to a class of canopies with a tapered or approximately elliptical planform.

**Exhibition Jump:** An exhibition jump, also called a display or demonstration jump, is a jump at a location other than an existing drop zone done for the purpose of reward, remuneration, or promotion and principally for the benefit of spectators.

**Exit Point:** The point on the ground over which skydivers leave the aircraft.

**Exit Weight:** The combined weight of the jumper and all his or her equipment for that jump.

**Extraordinary Skydive:** Night jump, water jump, jump from above 15,000 feet MSL, exhibition jump, preplanned cutaway jump, and other jumps requiring special equipment and procedures that might be unfamiliar to most jumpers.

## **F**

**FAA** (see **Federal Aviation Administration** )

**FAI:** (see **Federation Aeronautique Internationale** )

**Federal Aviation Regulations (FARs):** The parts of the Code of Federal Regulations that apply to aviation.

**Federal Aviation Administration (FAA):** An agency of the U.S. Department of Transportation whose primary function and responsibility is to control the nation's air traffic, including the certification of all civil aircraft and accessories, licensing of all civil pilots, mechanics, and riggers, and administration of the Federal Aid to Airports Program.

**Federation Aeronautique Internationale (FAI):** An international organization which governs all aviation sports, certifies all official aviation and space records, and governs official international competitions. Operates through a non-profit National Aero Club in each country.

**Final Approach:** The final portion of flight before a jumper or aircraft lands.

**Flare:** **1.** v. (Under canopy: To convert the downward speed of a parachute momentarily into lift. **2.** v. In freefall: To decelerate prior to approaching a formation. **3.** n. The act of flaring. **4.** n. A membrane used to distribute the load of a parachute at the line attachment points of some canopies.

**Flat Flying:** Freefall orientation primarily belly to earth.

**Flat Delta:** Freefall position with the body on one plane, legs extended and arms swept back, used as a starting or intermediate position when developing a track.

**Floater:** A jumper positioned outside the aircraft to leave slightly prior to the person or group designated as the target for the initial freefall formation (see also **Base**). A floater maneuvers from a position below the base relative to the horizon.

**Foreign Parachutist:** A parachutist who is neither a U.S. citizen nor a resident alien and is participating in parachute operations within the United States using parachute equipment not manufactured in the United States. (FAR 105 definition)

**Formation Skydiving (Relative Work):** **1.** Aerial maneuvers by two or more freefalling skydivers with each other, usually to form geometric formations. **2.** Competition discipline of flat-flying.

**Freefall:** The portion of a parachute jump or drop between aircraft exit and parachute deployment in which the parachute is activated manually by the parachutist at the parachutist's discretion or automatically, or, in the case of an object, is activated automatically. (FAR 105 definition)

**Free Fly:** v. To exit unlinked with other jumpers.

**Freeflying:** n. **1.** An unrestricted freefall discipline characterized by varied presentations to the relative wind. (see also **Sit Flying** and **Head Down** ) **2.** n. The competition event of freeflying.

**Freestyle:** **1.** A solo freefall discipline that involves choreographed multi-orientation static and dynamic maneuvers. **2.** The competition event of freestyle performed as part of a team with a camera flyer (freestyle skydiving).



**Full Flight:** The stabilized state of hands-off canopy flight under an open and fully functioning parachute.

**Funnel:** n., v. A freefall skydiving formation which has become unstable, usually due to one or more jumpers flying out of position, causing the participants to collapse the formation and land on top of each other.

## **G**

**Glide:** n., v. The combined horizontal and vertical movement of a descending canopy.

**Glide Angle:** (see **glide path** )

**Glide Path:** The trajectory of a parachute as it descends in flight towards a landing point on the ground.

**Go-Around:** n. (jar.) An in-flight operation where the aircraft circles at jump altitude.

**Governance Manual, USPA:** The official bound collection of the USPA Constitution and By-Laws. **Ground**

**speed:** The speed of an airborne aircraft or parachute relative to the ground it traverses in a given period of time.

## **H**

**Hand-Deployed Pilot Chute:** A small parachute thrown by hand in freefall to extract the main parachute from its container. (see also **PULL OUT** and **THROW OUT**)

**Harness:** n. The webbing of a parachute system that surrounds and retains a jumper.

**Harness and Container System:** The major component of a parachute system, usually unitized, which the jumper dons for the jump. It contains the canopies and certain accessory devices.

**Harness Hold:** A skydiving training discipline where a student is trained for independent, solo freefall but is accompanied by at least one USPA AFF Instructor until meeting the requirements in the BSRs for self-supervision in freefall. On the initial jumps, the AFF Instructor(s) assist the student on exit via a harness grip.

**Head Down:** adj., adv. Inverted vertical or nearly vertical freeflying orientation.

**Hook Knife:** A hook-shaped knife with an inside cutting edge. Used in certain emergencies to sever problem lines or components of a parachute system.

**Hook Turn:** (jar.) A canopy maneuver that results in a steep dive.

**Horseshoe** n. A partial parachute malfunction where part of the deployed parachute is entangled with the jumper or his or her equipment.

## **I**

**IAD:** (see **Instructor -assisted deployment** )

**Instructor, USPA:** The holder of a USPA Instructor rating qualified in one or more of four methods of instruction: USPA Accelerated Freefall, instructor-assisted deployment, static line, or tandem. The mid level of the USPA instructional rating hierarchy. A USPA Instructor may train and certify a student for the USPA A License, supervise USPA Coaches, and is eligible for appointment as USPA Safety & Training Advisor.

**Instructor -Assisted Deployment (IAD):** A method of passive deployment used for training skydiving students making their initial jumps. A USPA IAD Instructor controls a hand-deployed pilot chute while a student moves into position and jumps, at which point the instructor releases the pilot chute.

**Instructor Rating Course, USPA:** A course registered with USPA Headquarters to train, qualify, and test applicants for the USPA Instructor rating.

**Instructor Examiner (I/E), USPA:** The highest level of the instructional rating program. An I/E is an experienced USPA Instructor who has met additional proficiency requirements and passed a series of written examinations on a wide variety of skydiving related subjects. An I/E has all of the privileges of a USPA Safety & Training Advisor.

**Instructional Rating Manual (IRM), USPA:** The manual containing the collected documents and references required to conduct any course for USPA Coach or USPA Instructor ratings.





## **J**

**Judge:** The official who evaluates a competitor's performance. USPA issues judge ratings at both the Regional and National levels. The FAI issues a rating for internationally recognized judges.

**Jump Altitude:** Actual altitude of an aircraft above the ground at the time a skydiver exits.

**Jump Run:** The flight of the aircraft prior to exit, generally following a predetermined path.

**Jumpmaster:** n. 1. A skydiver, typically a senior jumper or instructional rating holder, who coordinates boarding and exit order, jump flight procedures, spotting, and emergency operations with the pilot. 2. v. To dispatch jumpers. 3. n. Prior to 2002, a USPA instructional rating for supervising student jumps.

## **L**

**Landing pattern :** n. The deliberate flight path, usually rectangular, that a jumper uses in the final phase of descent under canopy.

**Line Dock:** The docking of two canopies with the docker's canopy above the head of the person receiving the dock.

**License:** Certificate of proficiency recognizing that a skydiver has met a specified level of experience, skill, and knowledge. There are four classes of USPA licenses: A, B, C and D. USPA licenses are recognized internationally through the FAI.

**Line Twist:** n. A condition of parachute opening where the canopy has attained full or nearly full inflation but one or more complete twists have developed in the lines and/or risers. Can be dangerous when associated with a spin.

**Lineover:** n. A partial malfunction of a deployed parachute resulting in lines going over the top of the canopy. Also refers loosely to the partial inversion of a round canopy. (see also **Partial Inversion**)

## **M**

**Mae West:** n. (jar., archaic) WWII term for partial inversion. (see also **Partial Inversion**)

**Main Parachute:** A parachute worn as the primary parachute used or intended to be used in conjunction with a reserve parachute. (FAR 105 definition)

**Maintenance:** Inspection, overhaul, repair, preservation, and replacement of parts.

**Major Alteration:** An alteration not listed in the manufacturer's specifications that might appreciably affect weight, structural strength, performance, flight characteristics, or other qualities affecting airworthiness or that cannot be done by elementary operations. (see also **Alteration** )

**Major Repair:** A repair that if improperly accomplished may affect weight, structural strength, performance, flight characteristics, or other qualities which determine airworthiness.

**Malfunction:** The complete or partial failure of a parachute canopy to accomplish proper opening, descent, or flight characteristics.

**Master Rigger:** The higher of two certification levels for FAA riggers. May perform more complex repair tasks and approved alterations. (see also **Senior Rigger**)

**Mini three-ring:** Refers to a scaled-down version of the original three-ring release system. (see also **three-ring release**)

**Minor Alteration:** An alteration other than a major alteration. (see also **Alteration** and **Major Alteration**)

**Minor Repair:** A repair other than a major repair. (see also **Major Repair** )

**MSL:** Altitude measured from sea level.

## **N**

**NAA** (see **National Aeronautical Association**)



**NAS 804:** (National Aircraft Standard 804) defines the tests and minimum performance and safety standards which must be met for a parachute to receive approval under TSO C-23b. Adopted in 1949 and superseded in 1984 by AS 8015A.

**National Aeronautic Association (NAA):** The National Aero Club of the USA which represents the FAI. USPA is a division of the NAA.

**National Director:** (see **Board of Directors** ).

**Night Jump:** A skydive made from one hour after official sunset to one hour before official sunrise. The FAA considers any jump made after sunset and before sunrise a night jump requiring equipment specified in FAR 105.

**NOTAM (Notice to Airmen):** An air traffic advisory or notice filed with an FAA Flight Service Station by an airspace user.

## **O**

**Object:** Any item other than a person that descends to the surface from an aircraft in flight when a parachute is used or is intended to be used during all or part of the descent. (FAR 105 definition)

**Open Body of Water:** A body of water in which a skydiver could drown.

**Opening Point:** The ground point of reference over which the skydiver opens the parachute.

**Opening Shock:** (jar.) The decelerating force exerted on the load as the parachute deploys and inflates. Caused by the resistance of the canopy and items associated with it.

**Oscillation:** **1.** The swinging or pendulum motion of the suspended load under a canopy. **2.** In canopy formation, the swaying or swinging of a formation caused by poor docking, turbulent air, or too much movement of the people in the formation.

**Outboard:** Facing to the outside, such as a ripcord facing to the side of the jumper rather than toward the breast bone.

## **P**

**Pack:** v. To fold and close a parachute system in preparation for jumping.

**Parachute:** A fabric device that slows the descent of a falling object; derived from the French words "para," to shield, and "chute," to fall. Thus, parachute literally means "to shield from a fall."

**Parachute Drop:** The descent of an object to the surface from an aircraft in flight when a parachute is used or intended to be used during all or part of that descent. (FAR 105 definition)

**Parachute Jump:** A parachute operation that involves the descent of one or more persons to the surface from an aircraft in flight when a parachute is used or intended to be used during all or part of that descent. (FAR 105 definition)

**Parachute Landing Fall (PLF):** n. A method developed by the U.S. military to minimize the chance of injury from a hard landing under parachute. The jumper distributes the force of the landing in an orderly manner over the most robust areas of the body.

**Parachute Operation:** The performance of all activity for the purpose of, or in support of, a parachute jump or a parachute drop. This parachute operation can involve, but is not limited to, the following persons: parachutist, parachutist in command and passenger in tandem parachute operations, drop zone or owner or operator, jump master, certificated parachute rigger, or pilot. (FAR 105 definition)

**Parachutist:** A person who intends to exit an aircraft while in flight using a single-harness, dual parachute system to descend to the surface. (FAR 105 definition) (see also **Skydiver**)

**Parachutist in Command:** The person responsible for the operation and safety of a tandem parachute operation. (FAR 105 definition) Not necessarily a USPA instructional rating holder.



**Paragliding** n. (also **Parapente** ): An activity involving the use of a ram-air inflated wing, resembling a parachute, for gliding. Flights typically initiate by foot-launching from a hill or from a ground-based tow. Because paragliding jumping does not meet the FAA's definition of "the descent of an object to the surface from an aircraft in flight," it is not regulated by the FAA or addressed by USPA.

**Partial Inversion:** Inflation malfunction of a round canopy where one side passes through and inflates between two lines of the other side, resulting in two inflated lobes. (see also **Lineover** )

**Passenger Parachutist:** A person who boards an aircraft, acting as other than the parachutist in command of a tandem parachute operation, with the intent of exiting the aircraft while in flight using the forward harness of a dual harness tandem parachute system to descend to the surface. (FAR 105 definition)

**Permeability:** The amount or volume of air which can pass through a fabric assembly.

**Pilot Chute:** A small parachute used to initiate and/or accelerate deployment of a main or reserve parachute. (FAR 105 definition)

**Pilot Chute Assist:** A method of rigging a static line to a parachute where the static line opens the container and positively extracts the pilot chute before separating from the system. Typically a velcro strip or break cord of known strength is used.

**Pin 1.** v. To fly to another jumper and take grips on the jumper (freefall) or canopy (canopy formation).

**2.** n. The first jumper to make contact with the base, or target jumper, to begin a formation. **3.** n. Retaining device that when passed through a closing loop, locks the parachute system closed until activation.

**Pin Check:** n. (jar.) Pre-jump inspection of the parachute.

**PLF** (see **Parachute Landing Fall**)

**Plane:** n. A compressed vertical canopy formation.

**Planform:** The shape or footprint of a wing surface.

**Planing:** v. The act of compressing a parachute stack.

**Poised Exit:** A departure from an aircraft wherein the jumper uses an external structure as a brace to assist in gaining a stable position immediately upon leaving the aircraft.

**Porosity:** The ratio of open area to closed area in a fabric. Graded as high, low, or zero. Tightly woven and treated material has a lower porosity than loosely woven material.

**Practice Deployment:** An in-air exercise used to learn how to locate and operate a parachute deployment handle prior to opening. It may consist of pulling or throwing a practice or dummy handle (instructor-assisted deployment or static-line jumps) or touching the actual deployment handle in freefall or tandem droguefall.

**Premature Opening:** Unintentional opening of a parachute.

**Projected Landing Point:** The expected landing spot on the ground, based on the glide path of the parachute.

**Prop Blast : 1.** n. The airflow created by a propeller that is developing thrust. **2.** n. (jar.) relative wind on exit

**Pud** n. (jar.) An aerodynamically low-profile, soft handle that is ergonomically designed to fit into a clenched fist. Used for various parachute operation handles.

**Pull Out:** n. A type of hand-deployed parachute activation system. The jumper pulls a handle connected to the container closing pin and the internally packed pilot chute. (see also **Hand Deployed Pilot Chute**)

**Pull-up Cord:** A packing aid used to thread the closing loop through eyelets in the container and removed once the closing pin is inserted.



## R

**Ram-Air Parachute:** A parachute with a canopy consisting of an upper and lower surface that is inflated by ram air entering through specially designed openings in the front of the canopy to form a gliding airfoil. (FAR 105 definition)

**Rating Renewal Seminar, USPA:** A meeting of USPA instructional rating holders to exchange information, introduce and discuss new ideas, and to develop, improve, or assure the quality of skydiving instruction.

**Recommendations, USPA:** Principles, policies, and concepts applicable to skydiving or a related subject which are derived from experience or theory, compiled by USPA, and offered for guidance.

**Regional Director, USPA:** Members of the USPA Board elected from a specified geographical area and responsible for representing the interests of the skydivers in that USPA Region.

**Relative Wind:** The relative airflow opposite a body's trajectory, irrespective of the horizon.

**Relative Work (RW):** (see **Formation Skydiving**)

**Reserve Parachute:** An approved parachute worn for emergency use to be activated only upon failure of the main parachute or in any other emergency where use of the main parachute is impractical or use of the main parachute would increase risk. (FAR 105 definition)

**Reserve Static Line (RSL):** A connection between the main risers and the reserve activation system intended to initiate reserve activation following the release of a deployed main parachute.

**Reverse Flight (FULL STALL):** A non-flying canopy maneuver that collapses the canopy and may cause it to spin. Results from depressing the toggles until the trailing edge is lower than the leading edge. May result in an unrecoverable malfunction. (see also **Stall** and **Dynamic Stall**)

**Rib:** A vertical and longitudinal fabric membrane that forms the airfoil shape and primary structure of a ram-air canopy.

**Riser Dock:** In canopy formation, a momentum dock that puts the risers into the hands of the receiver. A very advanced technique.

**Rig:** (jar.) **1.** n. The complete parachute system used for skydiving. **2.** v. The act of maintaining, repairing, or modifying a parachute system. **3.** v. To don a parachute (**Rigging Up**).

**Rigger:** An FAA-certificated parachute technician. (see also **Master Rigger** and **Senior Rigger**)

**Ripcord:** An assembly, usually constructed with a metal cable that, when pulled, activates an operation on a parachute system.

**Riser (s):** Webbing straps that connect the main lift webs of the parachute harness to the lines of the canopy.

**Riser Loops; Riser Blocks:** Gripping loops or devices on a riser that make it easier to grasp.

**RSL:** (see **Reserve Static Line**)

## S

**Safety & Training Advisor (S&TA), USPA:** A local person appointed by the USPA Regional Director as his or her representative and who is available to provide advice and administrative assistance as the USPA representative at an individual drop zone or specified area.

**Sanctioned Drop Zone:** A drop zone which has been verified by a USPA Safety & Training Advisor or a USPA Regional Director as complying with the minimum drop zone requirements as stated in the USPA Basic Safety Requirements section of the USPA Skydiver's Information Manual. (see also **Drop Zone**)

**Self-Supervision:** The point within a student's training when he has been cleared by a USPA Instructor to jump without instructor supervision but has not yet completed all of the requirements for the USPA A license. See *Category E: Introduction of the Integrated Student Program*.

**Senior Rigger:** The initial certification level for FAA riggers that allows its holder to pack and maintain a parachute system and perform simple repairs. (see **Master Rigger**)



**Single-Harness, Dual-Parachute System:** The combination of a main parachute, approved reserve parachute, and approved single-person harness and dual-parachute container. This parachute system may have an operational automatic activation device installed. (FAR 105 definition)

**Single Operation System (SOS):** Refers to a parachute harness and container operation system with a combined single-point riser release and reserve ripcord handle. Pulling one handle will both release the risers and pull the reserve. (see also **Two-Handled System**)

**SIM:** Abbreviation for Skydiver's Information Manual (this book). (see **Skydiver's Information Manual**)

**Sit Flying:** Upright vertical freely orientation based on a seated position. (see also **Chute Assis**)

**Skyboard:** (see **Surfboard**)

**Skydive:** **1.** n. The descent of a person to the surface from an aircraft in flight when he or she uses or intends to use a parachute during all or part of that descent. **2.** v. To jump from an aircraft with a parachute.

**Skydiver:** A person who engages in skydiving.

**Skydiver's Information Manual (SIM), USPA:** The official bound collection of the USPA Basic Safety Requirements, USPA recommendations, relevant FAA references, and other USPA policies and programs that affect the majority of skydivers.

**Skysurfer:** A skydiver who jumps with a surfboard (skyboard).

**Skysurfing:** **1.** A freefall skydiving discipline using a specially rigged surfboard (skyboard). **2.** The competition event by that name.

**Slider:** A device which controls a canopy's inflation by progressively sliding down the suspension lines during inflation. Found on most ram-air canopies.

**Slinks:** A type of Spectra fabric connector link developed by Performance Designs, Inc., for attaching the lines of the parachute to the risers.

**Solo Student:** A skydiving student who uses a single harness, dual-parachute system.

**SOS:** (see **Single-Operation System**)

**Span:** The dimension of a wing measured from tip to tip.

**Spotting:** Selecting the correct ground reference point over which to leave the aircraft, selecting the course for the aircraft to fly, and directing the pilot on jump run to that point.

**Stable Freefall Position:** A position attained by a freefalling skydiver in which only controlled, planned movements are made.

**Stability:** That property of a body which causes it, when its equilibrium is disturbed, to develop forces or movements tending to restore the original condition. In skydiving, control of body position during freefall.

**Stack:** A vertical canopy formation with the jumpers gripping the canopy or lines just below the canopy.

**Static Line:** A line of cable or webbing, one end of which is fastened to the parachute, the other to some part of the aircraft, used to activate and deploy or partially deploy the parachute as the load falls away from the aircraft.

**Static Line Jump:** A parachute jump during which a static line is used to deploy or partially deploy the parachute. Used for training student skydivers.

**Stall:** n. The state of canopy flight control characterized by decreased glide and increased rate of descent. (see **Dynamic Stall** and **Reverse Flight**)

**Step-Through:** (see **thread-through**)

**Student:** A skydiver trainee who has not been issued a USPA A license.

**Supervision:** The general oversight of an activity taking place where the supervisor is readily available for counsel and direction and who is responsible that the activity is satisfactorily completed. (see **Direct Supervision**)

**Surfboard (Skyboard):** n. A rigid panel, similar to a snowboard, attached to a jumper's feet.

**Suspension Lines:** Cords, attached from the bottom of the parachute canopy to the risers, that distribute and suspend the weight of a skydiver under the inflated canopy.

**Swoop:** **1.** v. To rapidly dive toward and then make a controlled approach relative to a target. **2.** n. The controlled flight from above of one body to meet or fly close to another body, a stationary object, or the ground.

**Swoop Pond; Swoop Ditch:** A water obstacle used as a high-performance landing area.

## **T**

**Tandem Jumping:** A method of skydiving, typically used for training student skydivers or introducing newcomers to the sport, where one jumper shares a tandem parachute system with another.

**Tandem Parachute Operation:** A parachute operation in which more than one person simultaneously uses the same tandem parachute system while descending to the surface from an aircraft in flight. (FAR 105 definition)

**Tandem Parachute System:** The combination of a main parachute, approved reserve parachute, and approved harness and dual parachute container, and a separate approved forward harness for a passenger parachutist. This parachute system must have an operational automatic activation device installed. (FAR 105 definition)

**Target:** The landing area on a drop zone. For officially sanctioned competition, a three-centimeter disk.

**Technical Standard Order (TSO):** Issued by the FAA, requires compliance with minimum performance standards and specifications for material and products. Parachute specifications are referenced in TSO-C23.

**Terminal Velocity:** The equilibrium velocity that a freefalling body can attain against the resistance of the air. The greatest speed at which a body falls through the atmosphere.

**Thread-Through (step-through ):** (jar.) n. A leg strap configuration on a parachute harness that uses a single piece of adjustable hardware. The leg strap must be unthreaded to be disconnected, or the jumper simply steps into the connected leg straps when donning the rig. (see **B-12s**)

**Three-Ring Release:** A type of single point release invented by Bill Booth. The system is based on three interlocking rings on each riser held in place by a small loop that is retained by a cable. Pulling one handle releases both main risers simultaneously or nearly simultaneously.

**Throw Out:** **1.** n., adj. A type of hand-deployed parachute activation system. The pilot chute is folded into an external pouch, extracted and thrown. A curved closing pin or equivalent locking device on the bridle is extracted as jumper falls away from the pilot chute and bridle, allowing the container to open. (see **Hand Deployed pilot chute**) **2.** v. (jar.) To initiate deployment.

**Toggles:** n. Handles attached to the ends of the steering lines of a parachute canopy. (see also **Brakes**)

**Track:** **1.** n. A freefall position with the legs fully extended, knees locked, arms swept back, elbows locked, and torso fully extended and slightly bowed forward to achieve the maximum horizontal speed. **2.** v. To move at maximum horizontal speed in freefall.

**Trim Tabs:** A front riser pulley system for adjusting a canopy's angle of incidence or flight attitude.

**TSO-C23:** (see **Technical Standard Order**)

**Turbulence:** Disturbed air that can affect canopy flight and integrity.

**Two-Handled System:** Refers to a parachute harness and container operation system that uses separate handles for the canopy release and for reserve activation. (see **Single Operation System**)

## **U**

**United States Parachute Association (USPA):** A not-for-profit, voluntary membership association of skydivers whose purpose is promoting and representing skydiving. As a division of the NAA, it is the official representative of the FAI for skydiving in the U.S.

**Upwind:** The direction from which the wind is blowing.



## **W**

**Waiver:** n. **1.** Exception to the BSRs filed by a USPA official indicated in SIM Section 2-2. **2.** (jar.) A liability release.

**Water Jump:** n. A skydive which includes intentionally landing in an open body of water.

**Wind Drift Indicator (WDI):** n. A device used to determine the wind drift which a descending parachute will experience, so constructed as to descend at a rate comparable to a skydiver of average weight descending under a fully deployed main canopy of average specifications. Usually a weighted strip of crepe paper 10 inches wide and 20 feet long.

**Wing Suit:** n. A gliding jumpsuit designed with fabric membranes between the legs of the jumper and from each arm to the torso.

**Wing Loading:** n. The jumper's exit weight divided by the area of the parachute canopy, expressed in the United States in pounds per square foot.

