Category C
Training Aid

All training to be conducted by instructors of the:

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.

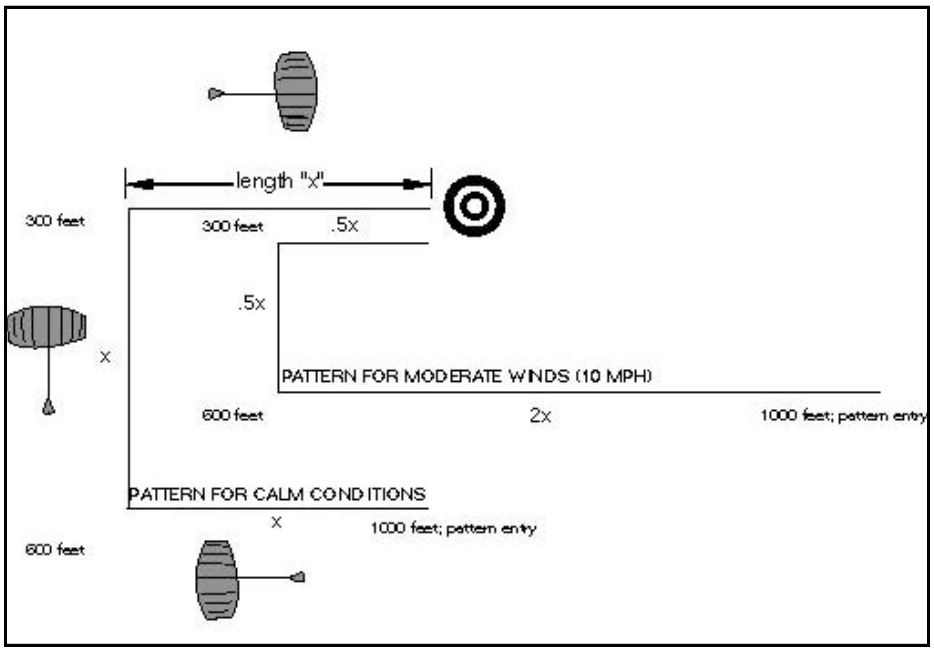

Illustration C.1 - Adjusting the pattern for the day's conditions

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:

   a. Land with the wing level and flying in a straight line.
   b. Land in a clear and open area, avoiding obstacles.
   c. Flare to at least the half-brake position.
   d. 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:

   a. The wing-loading ratio is the jumper's exit weight (geared up) divided by the square footage of the canopy.
   b. The canopy manufacturer publishes wing loading or load recommendations for each model of canopy:
      (1) In the canopy owner's manual.
      (2) On the manufacturer's website.
   c. Canopy performance changes with wing loading:
      (1) With a heavier wing loading, expect:
         i. Faster forward speed.
         ii. Faster descent rate.
         iii. Quicker turns.
         iv. Steeper and longer dive from a turn.
         v. More violent malfunctions.
         vi. More skill to flare correctly.
      (2) With a lighter wing loading, expect:
         i. Less drive against a strong wind.
         ii. Slower turns.
         iii. More forgiveness of landing errors.
         iv. Less predictable in turbulence.
   d. 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.

   e. Canopies may appear easier to land with more weight, to a point:
      (1) A good landing in ideal conditions does not mean a smaller canopy is safe to jump in all conditions.
      (2) 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).

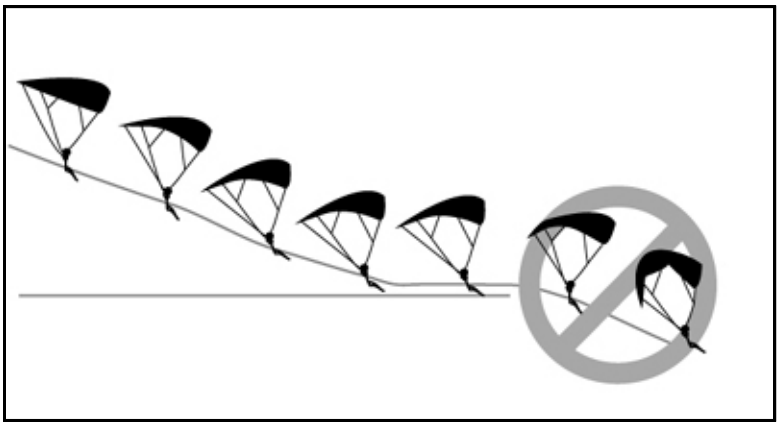

Illustration C.3 - When flared perfectly, the canopy lets the jumper down just prior to the stall.

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.

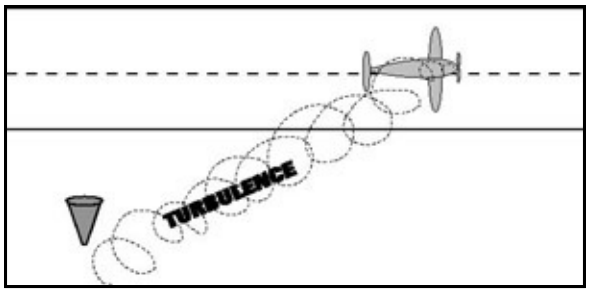

Illustration C.4 - Airplane propellers create turbulence.

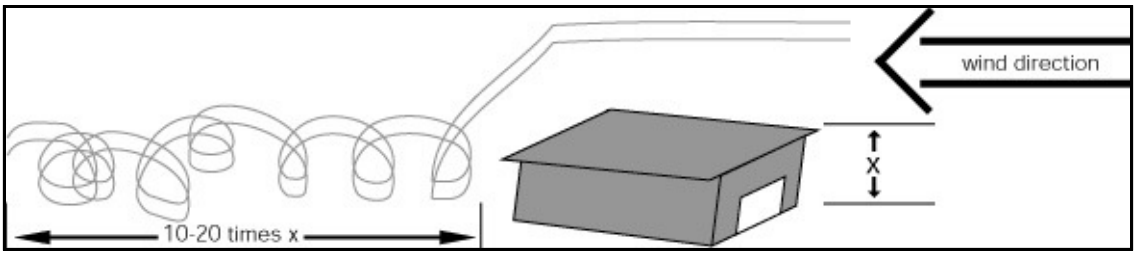

Illustration C.5 - Turbulence occurs downwind of an obstacle at 10 to 20 times its height, depending on the strength of the wind.

4. When flying in turbulence:

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

5. Recognition of a clear field:

   a. Power lines run along roads and between buildings, as well as randomly in open fields.
   b. A row of vegetation often hides a fence.
   c. Rocks, hills, and other terrain irregularities often remain invisible until just prior to touchdown.
   d. 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):

   a. 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.
   b. The turn from base leg to final is the most hazardous because of opposite approaching traffic
   c. Look and avoid.

7. Downwind landings are better than low turns:

   a. On calm days, unexpected wind shifts sometimes require jumpers to land with a light wind, instead of against it.
   b. 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.
   c. When faced with deciding between a low turn or a downwind landing, the downwind landing is the correct decision.
   d. When making a downwind landing:
      (1) Flare at the normal altitude, regardless of ground speed.
      (2) Roll on landing, using the PLF hard-landing procedure.
      (3) 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:

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

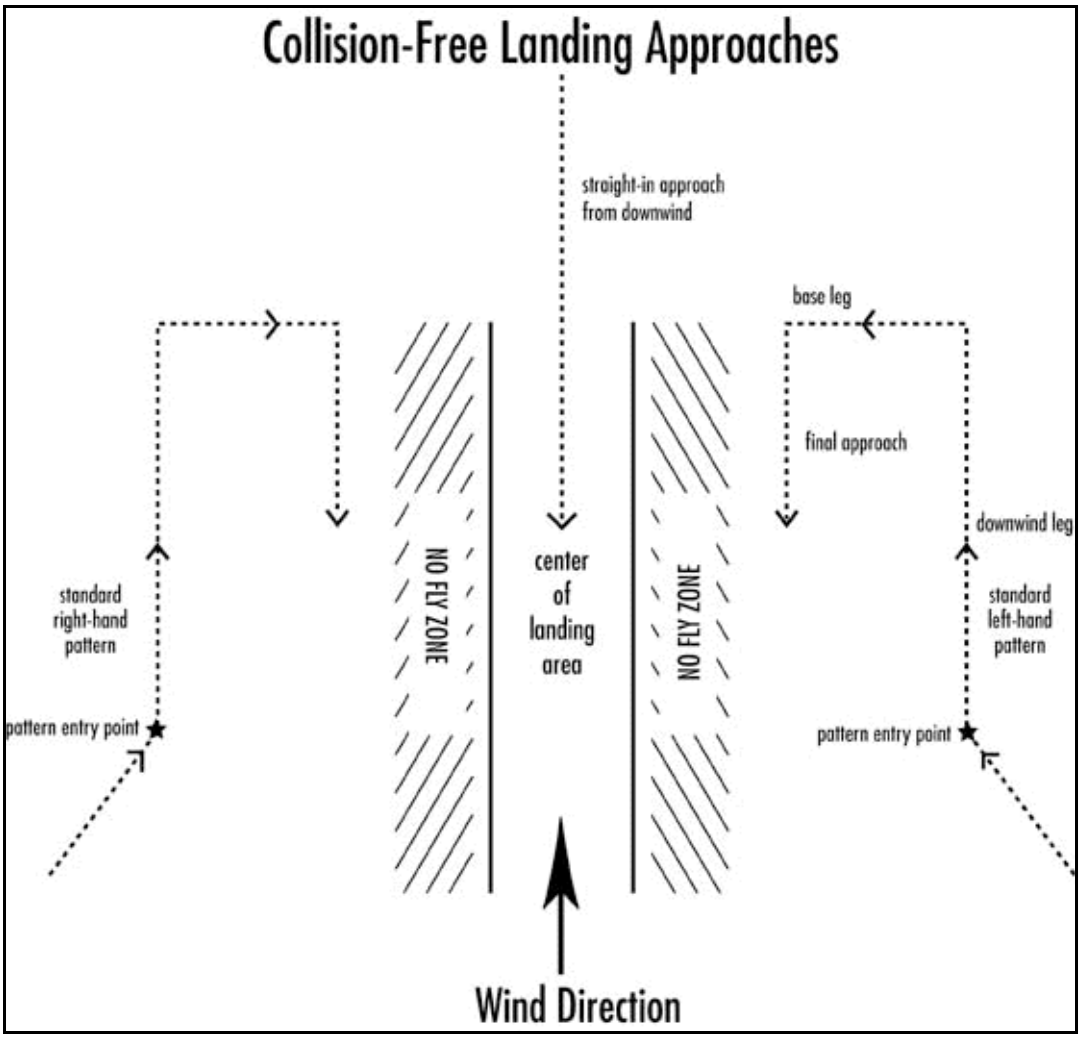

Illustration C.6 - Jumpers flying a right-hand pattern should land on the right side of the field; jumpers flying a left-hand pattern should land on the left side of the field.

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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, or call (540) 604-9740.