



# Category G Training Aid

All training to be conducted by instructors of the:



## 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.



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## **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.



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## **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.

