

ACCELERATED FREEFALL PROGRESSION : TANDEM TRAINING

A. FREEFALL POSITION

1. Skydivers first learn to fall belly first into the wind.
 - a. Falling belly first results in a more reliable deployment of the parachute, worn on the back.
 - b. The airflow when exiting the aircraft comes from ahead.
2. Arching and extending the legs slightly results in better belly-first control; and relaxing the rest of the body results in smooth, on-heading fall.
 - a. hips forward with back arched.
 - b. knees at shoulder width apart.
 - c. legs extended slightly, knees bent 45 degrees, toes pointed
 - d. upper arms positioned 90 degrees or less from the torso and relaxed
 - e. elbows bent 90-120 degrees, up, and relaxed
 - f. head up
 - g. practice until natural
3. Consciously breathing will help you relax.
4. Communications (See page 6)
 - a. Using hand signals, the instructor may coach you for a better body position and to improve awareness.
 - b. Your instructor will introduce you to the signals he or she may use.
 - c. You should respond to all adjustments smoothly and slowly and maintain the new position.

B. MAIN DEPLOYMENT

freefall

1. Establish belly-to-wind (arched) body position.
2. Maintain the arch and locate the deployment handle.
 - a. The deployment handle is mounted on the bottom of the container, look up while reaching for the handle.
 - b. Accentuate the arch while reaching for the activation handle.
3. For equal deflection of air (balance), stretch your left hand overhead and across as the right hand reaches for the deployment handle.
4. Activate, throw the handle vigorously, returning to the original position.
5. Verbalize each action, e.g., "Arch! Reach! Pull! Recover!"
6. After activation:
 - a. Remain flat, stable, and shoulders-level through deployment, counting to three by thousands.
 - b. After the count of three, visually check for pilot chute deployment.

C. SOLO EQUIPMENT ORIENTATION

1. Location of main activation handle.
2. The altimeter indicates altitude in thousands of feet from the ground.
 - a. handle with care
 - b. reads only approximate altitudes
 - c. sometimes fails
 - d. use of the altimeter in freefall:
 - (1) Skydivers freefall about 1,000 feet in the first ten seconds and 1,000 feet every 5.5 seconds thereafter.
 - (2) The altimeter needle moves backwards at approximately the same speed as the second hand of a clock.
 - (3) Freefall students should check the altitude—
 - (i) after every task
 - (ii) whenever encountering difficulty in completing the current task
 - (iii) whenever uncertain of the altitude
 - (iv) continually every 3 to 5 seconds
 - (4) If you don't know the altitude, open the parachute.
 - e. All students use the altimeter under canopy.
 - f. Altitude awareness is the skydiver's most important task until the parachute opens.
3. Parachute opening occurs in three stages:
 - a. Activation—Deployment of the parachute begins once the container is opened (activated) by throwing the pilot chute.
 - b. Deployment—The parachute comes out of the backpack.
 - c. Inflation—The canopy fills with air.
4. Within three seconds after activation, determine whether or not the canopy has deployed, inflated properly, and is controllable.
5. The open parachute canopy
 - a. To land safely, the parachute canopy must be regular in shape and controllable, and you must be able to reliably steer and flare the canopy for landing.
 - (1) rectangular (may be slightly tapered) canopy overhead with untangled lines
 - (2) lines connecting to four straps above the jumper's harness, called risers
 - (3) slider: a rectangular piece of fabric at the top of the risers
 - (i) moves down the lines during inflation.
 - (ii) slows and organizes the opening.
 - (4) steering handles, called "toggles" or "brakes," one on the back of each rear riser.

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D. EQUIPMENT PROBLEMS

1. For a parachute to be safe to land it must be:
 - a. “There,” meaning deployment has occurred and something is overhead.
 - b. “Square,” meaning that the parachute is inflated, rectangular (or slightly tapered), and regular in shape
 - c. “Steerable,” meaning that you can turn left and right and flare.
 - d. In the event of a toggle malfunction, the rear risers may be used for steering and flaring the canopy.
 - (1) Landing by flaring with rear risers should be practiced at sufficient altitude before attempting an actual landing with rear risers.
 - (2) Flaring with rear risers will require more strength than flaring with just the toggles.
2. If the parachute fails any of the above tests, you must initiate reserve parachute procedures.
3. Decide if the parachute is controllable and ready to land by 2,500 feet; otherwise, execute the planned emergency procedures.
4. Routine problems in order of correction:
 - a. To find a missing deployment handle, first find its location on the system (two additional tries).
 - (1) For bottom of container location, feel across the bottom of the back pack to the corner; then down the side to the corner, then go to reserve.
 - b. For a stuck main deployment handle, try again twice, then deploy the reserve.
 - c. To clear a pilot chute hesitation (burble), twist at the waist and look over your shoulder to change the airflow.
 - d. To untwist the lines, spread the risers and kick, but release the brakes only after clearing the twist.
 - e. To bring down a stuck slider, depress the toggles to the flare position and pump them.
 - f. To open the end cells, depress the toggles to the flare position and hold them.
 - g. If the canopy has opened normally but turns on its own, be sure both brakes are released.
 - h. Broken lines, rips, other canopy damage, or pilot chute entangled in the lines: Determine by 2,500 feet whether the canopy is steerable and flares without problems.

E. CANOPY PILOTING SKILLS

1. Basic canopy aerodynamics

a. A ram-air canopy is an inflatable wing that performs like the wing of an airplane.

(1) Once it is open and inflated, the canopy will start gliding forward and down through the air.

(2) The forward movement creates a flow of relative wind around the canopy.

b. The airflow around the canopy creates lift.

2. Steering the canopy

a. With both toggles all the way up, the canopy should glide straight ahead at full speed.

b. The canopy turns right when you pull the right toggle (steering control line handle) down and turns left when you pull the left toggle down.

c. The canopy will turn as long as one toggle is held down and stops turning when it is let up.

d. Pulling one toggle down a small amount produces a slow turn with a relatively small amount of dive.

e. Small toggle inputs can be used to make minor heading corrections at any point in the canopy flight.

f. Pulling one toggle down farther will produce a faster turn and causes the canopy to dive, which can have serious consequences near the ground.

g. To prevent a collision with another jumper, always look first in the direction of the intended turn.

h. Pulling both toggles down decreases the rate of descent and forward speed of the canopy.

3. Canopy speed and wind

a. When facing into the wind or “holding,” the canopy will fly more slowly across the ground.

b. When flying in the same direction as the wind, or “running,” the canopy will move more quickly across the ground.

c. When facing perpendicular to the wind or “crabbing,” the canopy will move forward and also drift sideways across the ground.

d. These effects become more pronounced in stronger winds.

4. Landing patterns

a. Each jumper is responsible for landing safely in a clear area.

b. Prior to boarding the aircraft before each jump, you should plan your landing pattern using an aerial photograph, diagram, map, or model of the drop zone.

c. Determine the current speed and direction of the wind.

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d. Locate the intended target and determine the wind line, which is an imaginary line going through the target indicating the direction of the wind.

(1) If the canopy is upwind of the target, the wind will tend to push the canopy toward the target.

(2) If the canopy is downwind of the target, the wind will tend to push the canopy away from the target.

e. In no-wind conditions or light and variable winds, the instructor and student should choose a predetermined landing direction and base the landing pattern on that plan.

f. Choose a point on the ground downwind and on the wind line where you will start your final approach at 300 feet.

g. Choose the point where you will start your base leg at 600 feet.

h. Choose the point where you will start your downwind leg at 1,000 feet.

i. The location of each point and shape of the pattern will vary depending on the strength of the wind.

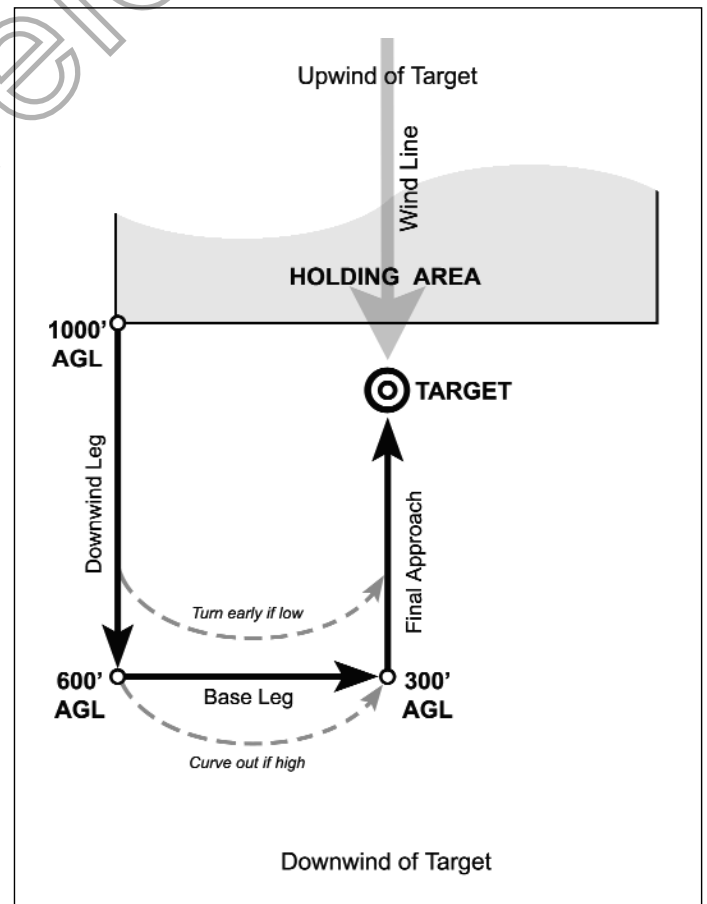
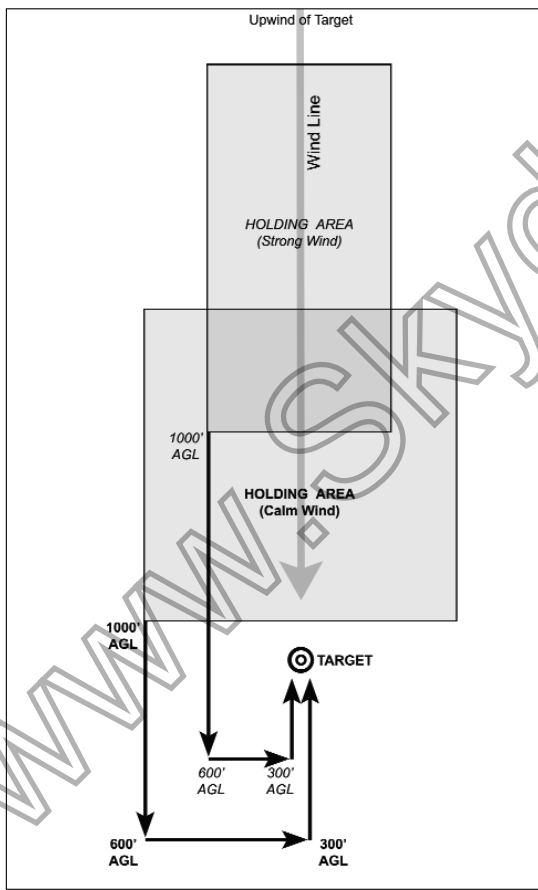
(1) In light winds, the pattern will resemble a square, with the downwind leg, base leg, and final approach being the same length.

(2) In light winds it is important to have plenty of clear space past the target in case you overshoot.

(3) As the winds become stronger, the final approach and base legs become shorter, and the downwind leg becomes longer.

(4) In strong winds, it is important to make the base leg and final approach turns over a clear area, in case you land short of the target.

j. Determine the shape and location of the holding area; this is ideally where you should be when the canopy opens, and where you should remain for most of the canopy flight.



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5. Normal canopy flight procedures.

- a. After checking for a good canopy, check your altitude then look directly below your feet and observe your position over the ground.
- b. Locate your holding area, target, and the "checkpoints" where you will start each leg of your pattern.
- c. If you are not inside your holding area, turn the canopy toward your holding area and fly toward it.
- d. Remain inside the holding area until 1,000 feet.
- e. As long as you are in the holding area and above 1,000 feet, you may practice turns and flares.
- f. Watch for other canopies, check your altitude, and check your position over the ground periodically, especially after each turn or practice flare.
- g. As you descend below 2,000 feet, fly toward the point where you will start your downwind leg (1,000 foot point).
 - h. Begin your pattern at 1,000 feet, flying to each of the checkpoints you picked on the ground.
 - (1) You may need to begin your base leg turn at 600 feet even if you have not arrived at the planned checkpoint.
 - (2) If arriving too high at the planned 600-foot checkpoint, correct by looping out during the base leg on the way to the 300-foot point.
6. Final approach and landing.
 - a. Once you have begun your final approach, your main priority is to keep the canopy flying straight toward a clear, open area.
 - (1) Small toggle inputs may be used to avoid obstacles on the ground.
 - (2) If the canopy begins to drift, use the appropriate input to stop the turn and keep the canopy flying straight toward a clear area.
 - b. S-turns may be used in the early part of the final approach if there is a risk of overshooting the entire landing area.
 - (1) S-turns should be avoided unless absolutely necessary, since they can present a hazard to other traffic.
 - (2) Always look in the direction you are turning to ensure clear airspace before the S-turn is initiated.
 - (3) You should finish any S-turns and resume straight and level flight for at least the last ten seconds of the final approach.
 - c. If the canopy is flying straight, keeping the toggles all the way up in the full glide position will help the canopy produce more lift when you flare.

d. It is easier to judge the flare height by looking mid-way towards the horizon rather than straight down below your feet.

e. During the last part of the final approach, put your feet and knees together in a PLF position.

f. Just before landing, convert the forward speed of the parachute to lift by flaring.

(1) When your feet are approximately twice your height above the ground, flare to half brakes.

(2) Flare the remainder of the way just before touching down.

(3) Your instructor may vary the exact flare technique based on the type of canopy you will be using or other factors.

g. If you start the flare too high, stop flaring and hold the toggles where they are.

(1) Letting the toggles up abruptly causes a steep dive.

(2) Keep looking ahead and keep the canopy flying straight.

(3) Push the toggles the rest of the way down before touching down.

h. You should be prepared to perform a parachute landing fall every time you land.

i. A stand-up landing should only be attempted if you touch down softly and are confident that you can comfortably remain on your feet.

7. Perception of speed.

a. The canopy may seem to fly very slowly until you get lower on final approach.

b. You may notice the speed for the first time at this point, which may trick you into flaring early.

c. The canopy needs speed for an effective flare.

d. Wait until the correct altitude to flare.

8. Changing winds.

a. Landing into (against) the wind is desirable, but not absolutely necessary.

b. Use available wind indicators to check the wind direction during your canopy flight.

(1) On days when the winds are light and variable, it may be best to maintain your original, planned pattern and landing direction even if the wind indicators change direction.

(2) If it is necessary to land in a different direction than planned, rotate your original pattern around the target so it lines up in the desired direction.

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d. Once you have begun your final approach, keeping the canopy flying straight toward a clear area is more important than landing directly into the wind.

e. Landing downwind or crosswind in a clear area is far less risky than making an aggressive turn near the ground.

9. Alternate landing areas.

a. Whether you land in the intended landing area or an alternate one, you should be prepared to make your own correct decisions and land safely without assistance.

b. If you are not in your holding area or close to it when the canopy opens be prepared to pick an alternate landing area.

c. Maintain altitude awareness while flying back towards your 1,000-foot point.

d. At or above 2,000 feet you should decide whether or not you will be able to reach your 1,000-foot point.

e. If it is obvious that the 1,000-foot point is unreachable:

(1) Look for your 600-foot and 300-foot points.

(2) If you are sure that you will be able to reach one of those points, fly toward it and remain over that point until you reach the correct altitude to begin that leg of your pattern.

(3) If it is obvious that you will not reach any point in your pattern by the correct altitude, then plan to land in a nearby open area, free of obstacles.

(4) Visually transfer the intended landing pattern to the new landing area.

(5) Fly the new landing pattern.

f. Any time you must land in an alternate area off of the airport property:

(1) Look carefully for obstacles and avoid them.

(2) Perform a parachute landing fall (PLF).

(3) Wait for assistance or further instructions.

(4) Be polite to property owners.

10. Priorities for all landings

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. Always be prepared to make a PLF.

Tandem Training dive Flow

Jump #1

- Exit with arms in safety position.
- On instructors signal, relax into neutral arch.
- Circle of awareness.
- Three practice deployments.
- Altitude, arch, legs relax.
- Lock on at 6,000 feet.
- Wave and pull at 5,500 feet.

Jump#2

- Exit with arms in safety position.
- On instructors signal, relax into neutral arch.
- Circle of awareness.
- Two practice deployments.
- Altitude check.
- 90° right turn.
- Altitude check.
- 90° left turn.
- Lock on at 6,000 feet.
- Wave and pull at 5,500 feet.

Jump#3

- Exit with arms in safety position.
- On instructors signal, relax into neutral arch.
- Circle of awareness.
- One practice deployment.
- Altitude check.
- 180° right turn.
- Altitude check.
- 360° left turn.
- Altitude check.
- Extend legs for three seconds.
- Lock on at 6,000.
- Wave and pull at 5,500.

Moving classroom checklist:

In aircraft

- Seatbelt use and rules.
- Keeping an eye on the DZ, locate.
- Emergency exits and altitudes.
- Premature parachute openings.

Under canopy

- Count to three in thousands and check canopy every time.
- Rear riser flares and turns.
- Flat turns and diving turns.
- Equipment familiarization, Risers, Slider, RSL, steering lines and toggels,
- Ground drift, into and with the wind looking straight down.

APPENDIX A-

FREEFALL HAND SIGNALS

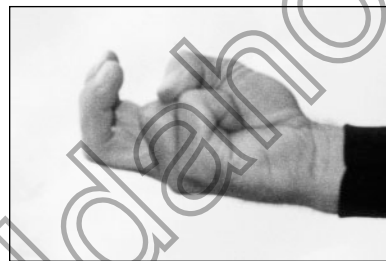
pelvis forward
(arch)



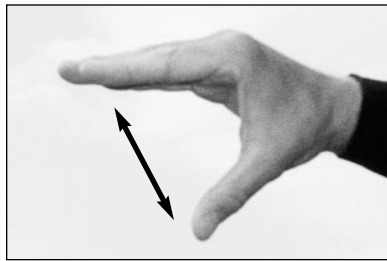
arch



extend legs six
inches and hold



legs in
(retract legs
slightly)

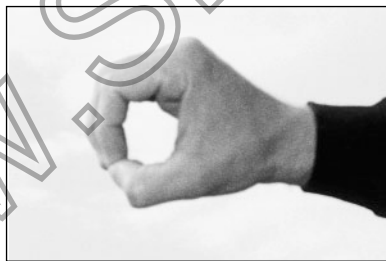


knees together
slightly
—or—
toe taps

check arm
position



circle of
awareness
(altitude check)



relax
(breathe)



perform the
practice
deployment
sequence



deploy the
parachute (pull)

