USPA B License Study Guide

Basic Safety Requirements

Basic Safety Requirements (BSRs) represent commonly accepted standards necessary to promote safety in average conditions. USPA grants waivers to some BSRs when an exception is needed. However, they can only waived by the full Board of Directors, unless designated in the SIM by an [S] S&TA or Examiner only or an [E] Executive Committee of the USPA Board. Waivers provide for the responsible research and development of improved techniques and methods.

Compliance with Federal Regulations

For skydives made within the U.S. and its territories and possessions, no skydive may be made in violation of Federal Aviation Administration (FAA) regulations. FAA regulations include the use of restraint systems/seatbelts in the aircraft by all skydivers during taxi, takeoff, and landing.

Medical Requirements

All persons engaging in skydiving must: possess at least a current FAA Third-Class Medical Certificate or carry a certificate of physical fitness for skydiving from a registered physician or agree with the USPA recommended medical statement in Section 4-3.

Age Requirements

For skydives made within the U.S. and its territories and possessions, skydivers are to be at least 18 years of age. [E]. For skydives made outside the U.S. and its territories and possessions, the minimum age is specified by the country's requirements.

Membership

USPA membership is required of any skydiver cleared for self-supervision at a USPA Group Member drop zone…with an exception for non-resident foreigners.

Alcohol and Drugs

No person may make a parachute jump, or attempt to make a jump, if that person is or appears to be under the influence of either alcohol or any drug that affects that person's faculties in any way contrary to safety. In addition no person may jump within 8 hours after the consumption of any alcoholic beverage.

The 8 hour rule also applies to pilots.

Winds

For licensed skydivers ground winds are unlimited.

Minimum Opening Altitudes

Minimum container opening altitude of 2,500 feet AGL for B license holders [E].

DZ Requirements

Areas used for skydiving should be unobstructed, with a minimum radial distance of 165 feet for B-license holders to the nearest obstacles [S]. Obstacles are defined as telephone and power lines, towers, buildings, bodies of water, highways, vehicles, and trees. However, trees that will not interfere with parachute landings are not considered obstacles.

Manned ground-to-air communications (e.g., radios, panels, smoke, lights) are to be present on the drop zone during skydiving operations.

Pre-Jump Requirement

The appropriate altitude and surface winds are to be determined prior to conducting any skydive.

Extraordinary Skydives

Night, water, and demonstration jumps are to be performed only with the advice of the appropriate USPA S&TA, Examiner, or Regional Director.

Pre-planned breakaway jumps (intentional cutaways) cannot be made by B-license skydivers.

Any person performing a wingsuit jump must have at least 200 skydives, and hold a current skydiving license. [E]

Freefall within 500 feet vertically or horizontally of any student under parachute, including tandem students, is prohibited (excluding a videographer). Freefall within 500 feet vertically or horizontally of any licensed skydiver under canopy requires prior planning and agreement between the canopy pilot and the skydiver in freefall.

Equipment

Aircraft

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. However, many drop zones have a written notification (for that location only) that is renewed annually. Skydives must be made within a 25-statute-mile radius of the airport of takeoff.

The jump aircraft must have an operating radio for jumping to take place, and the pilot must be in contact with air traffic control prior to jumping.

Some aircraft are unsafe for flight with the door open or removed. Aircraft approved for flight with the door removed may require additional modifications and usually require additional FAA field approval.

Skydive Equipment

Parachutes should not be rented or loaned to persons unqualified to carry out an intended skydive or to persons of unknown ability. The use of unfamiliar (borrowed, new) equipment without sufficient preparation has been a factor in many fatalities.

If making an equipment change, adequate transition training should be provided.

AADs and RSLs are encouraged for all jumpers.

Altitude awareness is critical on every jump. Altimeters, though, use electronic and/or mechanical components that are subject to damage and may fail in use. Minor differences (up to 500 feet) in altitude among different altimeters are to be expected, and an altimeter may lag during both ascent and descent. When an altimeter is in a jumper's burble it may read high by as much as 1000 feet. Therefore, pull altitude and other critical altitudes should be determined by using a combination of visual reference to the ground and to an altimeter. For example, learning what the size of cars looks like at different altitudes can help you build a mental library for estimating altitude.

Adequate protective clothing, including helmet, gloves, goggles, and footwear should be worn for all land jumps. Gloves become essential when the jump altitude temperature is lower than 40° F. A jumper should always carry a protected but accessible knife, in case an emergency dictates its use. A rigid helmet should also be worn on all skydives and it should be lightweight and not restrict vision or hearing.

All jumpers are advised to wear flotation gear when the intended exit, opening, or landing point of a skydive 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).

All parachute emergency procedures should be reviewed at least annually in a training harness. Emergency procedures can also be practiced on the ground at every reserve repack. To do so, simulate some type of main malfunction on the ground, then cut away and deploy the reserve. This practice gives you first-hand knowledge about the potential pull forces and direction of pull on your gear.

Maintenance

The FAA requires the reserve parachute assembly, including harness, container, canopy, risers, pilot chute, deployment device, and ripcord, to be approved. For a ram-air reserve, jumpers should not exceed the maximum suspended weight specified by the manufacturer (not necessarily the maximum certificated load limit).

The main parachute of a dual assembly may be packed by: an FAA rigger, a person under the direct supervision of an FAA rigger, or the person who intends to use it on the next jump.

It requires at least an FAA senior rigger to maintain and repair the parachute system. However, major repairs and alterations may be performed only by or under the supervision of: an FAA master rigger, the parachute manufacturer, or any other manufacturer the FAA considers competent.

AADs, if installed, must be maintained according to the manufacturer's instructions.

High-wear items requiring rigger maintenance include:

- Pilot chute and deployment handle: look for broken stitching around the apex and the seam where the pilot chute canopy fabric and mesh meet. Check for security at the bridle attachment point. The fabric and mesh should be in good condition, as both eventually wear out.
- Bridle velcro: velcro anywhere degrades with use and needs to be replaced every 100-250 uses. Bridle velcro (if present) is particularly important, because if it comes loose, it can cause a premature deployment. The velcro should be clean, dry, and free of debris.
- Deployment bag: look for distortion in the grommets, especially at the bridle, and fabric damage around their edges. Check the loops that hold the line stow bands. If velcro is used, replace it as necessary.
- Closing pin: check that the loop holding the closing pin to the bridle is secure and not being cut by the eye of the pin. Check for nicks or corrosion on the pin and replace it if any appear.

- Pilot chute attachment: look for wear where the bridle attaches to the canopy. Look for broken stitching on the canopy itself where it is reinforced for the bridle attachment loop or ring.
- Parachute damage: likely areas of damage include the top center skin, end cells, and stabilizers. 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). Look for wear on the top skin and end cells caused by contact with sharp objects or plants with thorns. Look for wear in and around the reinforcements in the stabilizers that contain the slider stops. Look for broken or missing stitching along the seams.
- Slider: inspect for distortion in the slider grommets and wear around their inside edges. Sliders are important, high stress components and should be maintained to the highest standard.
- Lines: look for wear anywhere along the lines, but especially where the slider grommets contact metal connector links. 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. Lines sometimes shrink unevenly over time, and all lines eventually require replacement; refer to the manufacturer's recommendations.
- Slider bumpers (metal connector links): slider bumpers (if present) protect the slider grommets and lines from damage by taking it themselves; most require periodic replacement. Bumpers need to be tight on the link or secured to prevent them from sliding up the lines and stopping the slider.
- Brake system: when velcro is used, placing the toggles on the risers immediately after landing prevents velcro damage and tangles. Velcro needs to be replaced when worn. Examine the brake lock eye for damage and wear. Look at the attachment point for the keeper ring, including the attachment ring stitching on the opposite surface of the riser. Inspect tuck-tab toggle keepers for security.
- Riser release system: 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). Be sure that any service bulletins on risers for that system have been accomplished. Check the fittings on both ends of the cable housings for security. 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. Check the front and back of the riser webbing for fraying or strains around the edges of the grommets. Look for broken or loose tackings on the cable housings. Check riser inserts (for cutaway cable ends) if installed.
- Riser covers: replace any retaining velcro when it loses tackiness. Replace distorted tuck flaps when they become ineffective (happens with use).
- Main container closing grommets: inspect for distortion and fabric damage around the edges. Feel for severe distortion or breakage of the plastic stiffener inside the fabric where the grommet is set.

- Main and reserve pin covers: replace velcro when it fails to stay firmly attached. Replace plastic stiffeners when distortion from use renders them ineffective.

Equipment should be stored in a cool, dry, dark place. Heat weakens AAD batteries and elastic stow bands; cars can reach temperatures that are too hot for safe prolonged storage. The ultraviolet rays of the sun degrade nylon, and moisture corrodes hardware (very dangerous, since rust degrades nylon) and promotes mildew (undesirable but harmless to nylon).

Many chemicals and acids damage parachute materials.

Maintenance of three-ring release system:

1. Disassemble the system every month to clean the cable and twist and massage the ends of the risers, since nylon riser webbing develops a memory, especially when dirty.
2. Clean the cables according to the manufacturer's instructions. A sludge-like coating builds up over time that causes them to bind, increasing the required pull force.
3. Reassemble the system.

Main closing loop: Damage greater than ten percent warrants replacement. Jumpers also need to check that there is sufficient tension to keep the container closed in freefall, as a loose closing loop could result in a premature deployment. Check the owner's manual for the correct tension; typically, the closing pin should require eight to 11 pounds to extract. The closing loop tension can be adjusted by moving the overhand knot or replacing the loop with the knot tied in the correct place. Use only closing loop material approved by the harness and container manufacturer.

Emergency Procedures

Malfunctions

Skydiving is made safer by always anticipating and being prepared to respond to the types of emergencies that may arise. The majority of all malfunctions can be traced to three primary causes: poor or unstable body position during parachute deployment, faulty equipment, and improper or careless packing.

All malfunctions can be classified as one of two types: total malfunction (parachute not activated, or activated but not deploying) or partial malfunction (parachute deployed but not landable). The recommended minimum cutaway decision and execution altitude for B license skydivers is 1800 feet.

Reserve pilot chutes are manufactured with a metal spring in the center, which adds weight to the reserve pilot chute. During a stable, belly-to-earth reserve deployment, the reserve pilot chute can

remain in the jumper's burble for several seconds, delaying the reserve deployment. Therefore, immediately after pulling the reserve ripcord, look over your right shoulder while twisting your upper body upwards to the right, or sit up in a slightly head-high orientation, in order to change the airflow behind your container to help the reserve pilot chute launch into clean air.

Most harness and container manufacturers secure the steering toggles to reserve risers using Velcro, which will firmly hold the toggle in place. Be sure to peel the Velcro before attempting to pull the toggles free from the risers to release the brakes.

Off-field Landing

If you are more than halfway down, but not yet halfway back to your desired landing area then you need to locate an alternate landing area. Do not waste altitude trying to reach the main landing area when a viable alternative is available.

Based on wind speed and direction, locate a new area, keeping in mind that there may be good alternatives behind you. Plan a descent strategy and landing pattern for the alternative landing area, including identifying areas of possible turbulence. Scan the new area every 500 feet and constantly 500 feet and below for obstacles. Remember to anticipate where power lines are located since they can be difficult to see. Fences and hills can also be difficult to see from higher altitudes.

Freefall

To remain current you must make a jump every 90 days. To regain currency after a period of inactivity you will need to make a recurrency jump with an instructional rating holder (coach or instructor).

Supplementary oxygen available on the aircraft is mandatory on skydives made from higher than 15,000 feet (MSL) and pilots above 14000 feet.

When jumping with others, it may be necessary to recover altitude from below the level of a formation. To ensure that you do not collide with the others in the formation, you should turn 90 degrees relative to the formation to keep it in view and then slow down your fall rate.

Cloud Clearance Requirements

The FAA requires that skydivers maintain safe distances from clouds, so that aircraft in the vicinity may be seen and avoided. Jumps made from above 10,000 feet MSL require a greater distance than jumps below 10,000 feet MSL since aircraft speed becomes unrestricted above this altitude.

Here's how I remember cloud clearance requirements:

Horizontal distance from a cloud is always the greatest distance, and I haven't found any tips for remembering visibility….just memorize it. These types of questions show up on every license exam.

Above 10, 000 feet all the distances begin with 1. 1 mile horizontal distance and 1000 feet above or below (vertical distance) is needed. 5 miles visibility

Below 10, 000 feet all the distances are halved from each other. 2000 feet horizontal distance, 1000 feet above a cloud layer, and 500 feet below a cloud layer is required. 3 miles visibility

Freeflying

Before engaging in freeflying, the skydiver should either hold a USPA A license or receive freeflying instruction from a USPA instructional rating holder with extensive freeflying experience. The skydiver should also demonstrate sufficient air skills, including consistent altitude awareness, basic formation skydiving skills, ability to track to achieve horizontal separation, understanding of the jump run line of flight, proficiency in movement up, down, forward, backward, and rotation in a backfly position before attempting sit maneuvers.

Before attempting a standing or head-down maneuvers, the skydiver should demonstrate proficiency in movement up, down, forward, backward, and rotation in a sit position..

Gear used in freeflying must be properly secured to prevent premature deployment of either canopy, as a premature opening at the speeds involved could result in severe injury to the body or stressing the equipment beyond limits set by the manufacturers. Deployment systems and operation handles should remain secure during inverted and stand-up flight; therefore, equipment for freeflying should include bottom-of-container mounted throw-out pilot chute pouch, pull-out pilot chute, or ripcord main deployment system, completely covered pilot chute bridle, and closing loops, pin protection flaps, and riser covers well maintained and properly sized. Use of a tuck-tab is also recommended to provide additional security of the pilot chute during high freefall speeds encountered while freeflying.

Leg straps should be connected with a seat strap to keep the leg straps from moving toward the knees while in a sitting freefall position or making transitions. Excess leg and chest straps should be tightly stowed.

Personal accessories for freeflying should include audible altimeter (two are recommended), visual altimeter, hard helmet, and clothing or jumpsuit that will remain in place during inverted and stand-up freefall and will not obscure or obstruct deployment or emergency handles or altimeters.

Inadvertently transitioning from a fast-falling body position to a face-to-earth position (known as "corking") results in rapid deceleration from typically 175 mph to 120 mph. Therefore, freeflying in a group requires the ability to remain in a fast-flying position at all times and remaining clear of the airspace above other freeflyers. Assuming a fast-falling position when the other skydivers are in a slow-falling position puts the freeflyer below the formation, creating a hazard at break-off.

Head-down and sit-fly positions present a different visual picture of the earth; freeflyers may not be visually aware of their altitude.

As a general rule, faster-falling groups should leave after slower-falling groups particularly when jump run is flown against a strong headwind.

Extraordinary Skydives

Night Jumps

Night jumps provide the challenge of a new and unusual situation that must be approached with caution because of the opportunity for disorientation, the new appearance of the earth's surface and the lack of familiar reference points, and impaired vision and depth perception.

One of the first effects of hypoxia, evident as low as 5,000 feet, is loss of night vision. It takes approximately 30 minutes to recover from the effects of hypoxia. Smokers suffer the effects of hypoxia sooner than non-smokers.

Night vision requires 30 minutes to fully adjust. In addition, carbon monoxide from exhaust fumes, deficiency of Vitamin A in the diet, and prolonged exposure to bright sunlight all degrade night vision.

Skydivers infrequently make night jumps, and are less familiar with and less proficient in handling themselves under the conditions of this new environment. Since the skydiver cannot perceive what is taking place as rapidly and easily as in daylight, it takes more time to react to each situation. A jumper's own shadow cast by the moon can resemble another jumper below and be another cause of confusion.

A jumper making a first night jump should exit solo. A full moon is advised for jumpers attempting any relative work.

A jumper should consider having the following equipment on a night jump: lighted altimeter, clear goggles/visor, a flashlight to check their canopy, and a whistle. A whistle may be used to warn other jumpers under canopy, after landing to signal other jumpers, and to aid rescuers in locating a lost or injured jumper.

The FAA requires that a light visible for at least three statute miles be displayed from opening until the jumper is on the ground for protection from aircraft.

With others in the air, jumpers should fly their parachutes predictably and avoid spirals. All jumpers on each pass should agree to the same downwind, base, and final approach and the altitudes for turns to each leg of the landing pattern.

Water Jumps

When encountering a water landing, intentional or unintentional, you should first identify any other obstacles that may be in the area that should be avoided. This includes trees, power lines, objects on the water (such as boats, buoys, docks, bridges), and rough water (like waves or swift currents). Once you've identified where obstacles are located then you can identify a safe landing area that is close to the shore or something that floats and continue to steer towards it. If possible, translate your landing pattern to the new landing area. Remember that you should be scanning the landing area every 500' and from 500' and below to identify any new obstacles that you were unable to see at a higher altitude.

While steering yourself for a safe landing, you should disconnect the RSL (to facilitate cutting away your main parachute, if necessary), open your chest strap as much as possible, and visors on full face helmets should also be opened (or you may consider getting rid of the helmet completely). If you are wearing a flotation device that needs to be activated, now is the time to do so.

As you prepare to enter the water, remember the four landing priorities for every jump.

1. Land with the wing level and flying in a straight line.
2. Land in a clear and open area, avoiding obstacles.
3. Flare to at least the half-brake position.
4. Always be prepared to make a PLF.

As always, slight heading corrections can be made on your final approach, but turns should be avoided. Continue to steer the parachute to your selected landing area, avoiding obstacles. Bring your feet and knees together in preparation for a PLF, since you don't know what the depth of the water will be or what objects may be submerged.

When it appears that you are 10 feet from the surface of the water, you should only flare to the half brake position, since judging one's altitude over water is quite difficult when there are no reference points around. Once your feet touch the water, then you know that you can safely finish the flare.

Enter the water with air in your lungs and perform a parachute landing fall, if needed. You may wish to cut away your main parachute at this point, if you are concerned about waves or a swift current. However, your parachute will remain on the surface for some time before water has a chance to enter the nose of the parachute. In addition, studies have shown that a container with a reserve packed inside is surprisingly buoyant for anywhere between 30 and 45 minutes.

If you have landed in deeper water, you should get out of your harness. To do this, let go of the toggles. Bring your hands to your ribs with bent elbows and then throw your arms back to shrug off the rig. You may need to loosen your leg straps and chest strap a little more if you encounter difficulty at this point. Once free of the rig, swim down and away to avoid entanglement with the lines. Swimming upstream or upwind is your best choice.

Come up to breathe whenever you have the opportunity. If you find you are stuck underneath your parachute, punch up to form an air pocket, and then find a seam and follow it to the edge of the parachute.

Once away from your rig, you need to decide what to do with your equipment. You may wish to remove any full face helmets (if you haven't already) and abandon your rig if you can safely make it to shore. You may decide to stay near your equipment, especially if your parachute is a bright color and will help rescuers to your location.

Canopy Formations

Before engaging in canopy formations, a jumper should have a thorough knowledge of canopy flight characteristics, including riser maneuvers and an understanding of the relative compatibility of various canopies. The jumper should also have demonstrated accuracy capability of consistently landing within 16 feet of a target.

Initial training should be conducted with two jumpers—the beginner and a canopy formation specialist—and include lessons in basic docking, break-off procedures, and emergency procedures.

The following items are essential for safely building canopy formations, hook knife (necessary for resolving entanglements), ankle protection from suspension lines, and gloves for hand protection.

Parachute Flight

Braked Turns

Performed correctly, braked turns provide the quickest heading change with the least altitude lost.A braked turn may be the best choice when a quick heading change is needed., such as when suddenly

encountering another jumper under canopy or someone in the landing area, recognizing an obstacle, and/or when too low to recover from a full-flight turn.

Glide Path

The parachute's glide path may be adjusted by using riser or toggle inputs. Pulling on the front risers will increase your descent rate while pulling on the brake toggles or rear risers will minimize your descent rate. However, depending on your flight path in relation to the wind, your glide path will change.

When heading with the wind, pulling on brake toggles or rear risers will increase your glide path, allowing you to cover more ground than when in full flight. The effect on glide path decreases as the wind speed decreases in this scenario.

When flying a parachute into the wind, applying brake toggles will steepen your glide path and you will not cover as much ground as compared to full flight. This effect on the glide path will increase as wind speed increases.

Front Riser Turns

Like all turns, jumpers should watch for traffic below and to the sides prior to initiating a front-riser dive. Both steering toggles should be kept in hand when performing front-riser maneuvers to make heading changes more reliably and quickly if necessary.

Front riser maneuvers can be very dangerous near the ground for several reasons. Turbulence may affect canopy heading or descent rate, 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), and traffic within the landing pattern can increase the odds for a canopy collision. Therefore, a crowded landing pattern is never the place for high-speed maneuvers.

Canopy Collision Avoidance

Most canopy collisions occur soon after deployment when two jumpers open too close to each other, or below 1,000 feet while in the landing pattern.

It's imperative for all jumpers to track away at the planned altitude. Breaking off 1500 feet higher than the jumper with the highest planned deployment altitude is recommended for RW groups of 5 or fewer. A higher break off altitude will be needed for larger groups and faster falling groups.

Jumpers should know where other nearby jumpers are during opening and steer with the back risers to avoid them. Once the jumper has identified where the other jumpers from their group are located, they should begin to identify the position of any other jumpers that exited from their aircraft.

The potential for collision with other jumpers increases when making performance maneuvers in traffic or near the ground, as other jumpers may be focused more on the target than on traffic. The lower jumper always has the right of way, and it takes only one jumper to avoid a collision. You will also find, when downsizing, that jumping a faster canopy requires more attention to traffic.

If a head-on collision is pending, both jumpers should turn right.

If a collision is inevitable, then protect your face and operation handles, tuck in your arms, legs and head for protection against the impact, and avoid hitting the suspension lines of the other canopy or the other jumper, if at all possible.

If a collision with the other jumper's suspension lines is unavoidable, it may be possible to spread your legs and one arm, while protecting your handles with the other arm, in order to keep from passing through the suspension lines during the collision. However, a collision at high speed with suspension lines can lead to severe cuts and burns.

The recommended minimum cutaway decision and execution altitude for B license skydivers is 1800 feet.

Both jumpers should try to communicate with each other before taking action; communication can be complicated if either jumper is wearing a full-face helmet. The jumper above can strike the jumper below during a cutaway unless one or both are clear or ready to fend off. The jumper below can worsen the situation for the jumper above by cutting away before he or she is ready. If both jumpers are cutting away and altitude permits, the second jumper should wait until the first jumper clears the area below.

Below 1000 feet it may be necessary to deploy one or both reserve parachutes.

Wing Loading

Wing loading is calculated by dividing the exit weight of the jumper by the square footage of the canopy they are using.

It is recommended that B license skydivers have a maximum wing loading of 1.0 pounds per square foot (psf). In addition, any parachute 150 square feet or smaller is considered a high-performance parachute and only recommended for D license holders, regardless of the wing loading.