Cliff Jumper’s Association of America

General Guidelines
1997

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The CJAA was formed by jumpers and manufacturers across the country in an effort to help the BASE jumping community unify it self in pursuit of legal jumping. We believe the cliffs within our own country represent the natural venue for increased access and credibility. Understandably, jumping from privately owned structures presents many concerns for property owners and we are rarely granted access. The majority of jumpable cliffs within the United States are on either National Park Service or Bureau of Land Management property. These are public lands.

As the BASE jumping community develops a track record of successful, sanctioned jumping with standardized practices and record keeping, opportunities will present them selves for legal jumping from objects of all types.

The CJAA was not created as a policing organization but rather a source of information and leadership for the ever-increasing number of participants.

During it's summer quarterly meeting July 30th and 31st 1996 the CJAA was restructured in an effort to focus our resources. Our principal goals were defined as safety and access.

Safety: This was addressed by the creation of this General Guidelines Manual. It will answer many fundamental questions for both new and experienced BASE jumpers and help standardize techniques and equipment within with what is currently accepted. It is an on going reference that will change and grow with time, as does our knowledge. It is offered as a reference only. It is not a substitute for proper training or good judgment. Open lines of communication with manufacturers are encouraged. All participating manufactures are offering training curriculums that fall within these general guidelines.

Access: Addressed by organizing all available legal sites and conducting successful small scale events in order to generate a favorable track record and a show of credibility. We presently have four sites available with more pending. Some of these are cliffs others are privately owned structures. The intent is to have four legal events per year with more to follow.

It was also decided at the meeting to remove the CJAA from the legal forefront of access issues. The CJAA was set up to be a supporting organization. A separate entity has been created to contend with the legal arguments over access. "It's Our Park Too" legal access fund is presently supporting several National Park access issues.

A set of minimum standards was established. These are intended to lend some credibility to the possession of a CJAA membership. The minimum standards are not intended to create an elite group but rather signify that a person possessing membership has the basic skills to participate. The intent of the minimum standards is to define a person's qualifications to participate or learn the sport rather than demonstrate a level of achievement.
The creation of various licensing levels may come at a later date if the need arises.

There are two tiers of membership:

Subscription: This is intended for non-jumping members who wish to receive "The Rock Hopper" newsletter and help support the organization's goals.

General Membership: To qualify for this level of membership an applicant must meet the following minimum standards. Be at least 18 years of age, possess a minimum of 150 parachute jumps (exceptions may be made based on special circumstances), have an understanding of basic parachute nomenclature and packing.

Both tiers of membership cost $25 and will receive the "Rock Hopper" newsletter, a copy of this manual including updates when available, a window sticker and membership card. As a member you will get the opportunity to qualify for legal jumps in this country and most importantly, you will be contributing to the future of our sport. Without guidance, BASE jumping is destined to remain in its adolescence. Take part in shaping the future of our sport.

To have a membership application sent to you, send a SASE to:

CJAA
PO BOX 8117
Tahoe City, CA 96145

Or call (916) 583-7780 for more information

To contribute to "It's Our Park Too" legal access fund, please send donations to:

It's Our Park Too
C/O Fred Morelli
Attorney at Law
PO BOX 1416
Aurora, IL 60507

For a $30 donation you will receive a custom T-Shirt. Call (916) 583-7780 for more information.

General Guidelines for Fixed Object Jumping

Preparation

Planning: Proper planning for a BASE jump is important. Take into consideration exit point access and allot an appropriate amount of time. This is especially important if you are hiking in alpine areas. Be prepared for changing weather that may force a delay or a no-jump situation and have a plan to accommodate these situations. Have a plan if jumpers become separated or injured. Plan your jump - jump your plan. A little forethought will go along way to prevent confusion and miscommunication and can be invaluable in an emergency.

Readiness: Prepare yourself personally for your jump. Whether this means maintaining adequate physical fitness for an upcoming trip or simply allowing enough time to pack so you can go to the exit point confident in your equipment. Be prepared.

Research: Be sure to adequately research your jump. Do you know how high above sea level your landing area is? Have you walked your landing area? Have you looked at your "outs"? How long of a delay will you take? Where is the closest hospital? Etc.
Consider all the variables.

Equipment

There are various types of equipment available for BASE jumping. Many of the choices to be made are a matter of personal taste and intended use. The use of contemporary skydiving equipment or older used skydiving gear is not recommended. There are several manufactures dedicated to BASE specific equipment. Speak to them about what is appropriate for your intended type of jumping. They can supply you with what you need or offer suggestions as to the suitability of other options.

The Canopy: Generally, ram air canopies appropriate for BASE are low aspect ratio designs. Aspect ratio refers to the relationship between the canopy's chord and it's span. For example, if a canopy has a span of 20' and a chord of 10' it's aspect ratio would be 2.0:1. Simply divide the span by the chord to arrive at the value. Low aspect ratio is considered anything below 2.2:1. Low aspect ratio canopies open more predictably on heading, generate more drag and thus fly slower, have a longer control range and are easier to control in tight or demanding situations.

Wing loading is also an important criteria in selecting a parachute. Wing loading is the ratio of suspended weight to canopy planform area. Suspended weight includes the jumper and ALL his equipment. Canopy planform area (in simple terms) is the span x chord. The higher the wing loading - the greater the speed.

BASE jumping does not tolerate mistakes. The condition of our equipment is important. Our equipment choices and maintenance are two things we can use to help further minimize statistically infrequent occurrences. Your gear should always be in unquestionable condition.

Harness Container Systems: The term "BASE rig" is often used to refer to a single parachute container that is closed with Velcro™. These are available from various manufactures. They work well for what they were intended to do. However, Velcro™ closed rigs do have limitations. Specifically, exposing the Velcro shrivel flap to direct airflow at high speeds or failing to maintain the Velcro can lead to premature container openings. If this happens the free falling jumper will be confronted with a horseshoe malfunction. If the majority of your jumping involves delays in excess of 6 seconds or you intend to perform aerobatic maneuvers on a regular basis, you may wish to consider the option of a pin – closed single parachute rig. There are also rigs available that utilize more than one parachute. These include specialty rigs for BASE jumping and modified skydiving rigs. There are pros and cons to both single and two parachute systems. No one system is necessarily ideal for all types of BASE jumps. Contact the manufacturers and educate yourself.

Deployment Systems

Bag: Contains the parachute until line stretch. Lines are usually packed on the bag. Bags are not recommended for BASE. Principally for their tendency to spin during deployment creating off heading opening and/or line twists. If a bag flips during deployment it can also lock itself closed causing a bag lock malfunction. The problems with bags are exasperated in BASE due to the high snatch forces associated with BASE pilot chutes. The low airspeed deployments also increase the possibility of the bag turning during deployment. Moreover, a classic mistake in BASE is to deploy head low. This scenario invites serious problems if a deploying bag is kicked.

Sleeve: Effectively a long bag. The canopy is generally not folded as many times prior to inserting into the sleeve. Due to it's shape it offers the BASE jumper some advantages over a standard deployment bag. There is less inertia involved in lifting it from the container, as it's mass is lifted in stages rather than simultaneously as with a bag. It will have less tendency to spin because of this. Sleeves are generally manufactured with a line stow pouch rather than simply stow bands. This minimizes the potential for spin. Also, well-designed sleeves will incorporate a safety stow which helps to prevent bag lock. Sleeves have proven well suited to high-speed deployments as they offer more control over the deploying canopy than the tail pocket.

Tail pocket: A small tight - fitting pouch for the suspension lines. Sewn to the trailing edge of the canopy. Lines can be free - stowed or rubber band stowed inside the tail pocket. The idea is to deploy the canopy from a free packed configuration. This tends to produce the best results with regard to heading. The ideal deployment will be staged; lines then canopy. The tail pocket does this adequately but not as efficiently as bags, sleeves or diapers.

Diaper: Usually a wrap of some type. It allows the use of a free - packed canopy but stows the lines on the canopy. The diaper is used to physically lock the canopy closed until all lines are deployed. Diapers are more efficient at staging openings than tail pockets. However, the potential for a lock is higher

Assisted Deployment Systems

These refer to deployment systems that fix one end of the deployment chain to the object and the falling jumper initiates the deployment. There is no free fall involved. These systems are appropriate for use on objects that require an immediate opening because of altitude or obstacles.

Static Line: Break cord or Velcro is used as a separable link between the canopy and the anchor point. Static lines offer the benefit of no additional assistance needed. However, all of the potential negatives of free fall deployments; poor sequencing, off-heading openings must be considered. Static line systems can fail in a variety of ways. Be positive of your rigging. Mistakes can be fatal.

Pilot Chute Assist: A helper holds the pilot chute firmly until the jumper reaches line stretch. The advantage to this system is the presence of a pilot chute as a back up. If ambient winds are present it also loads the canopy during deployment helping inhibit wind induced twists. The negative is that you are trusting your safety to someone else.

Direct Bag: The parachute is packed into a special deployment bag. Generally, these are designed to be hand held. They will have handles and a safety line to be secured to the object at a minimum. A helper holds the bag over the edge as the jumper exits. Direct bags offer fast, sequenced deployments and a very good probability of on - heading openings.

Components

Risers/toggles: Risers constructed from Mil -W-27265 T/XVII (type 17, 1.0" webbing) are not appropriate for BASE. Several BASE specific designs are available. These all use webbing of at least 3600lb TS (type 8). Risers should be designed specifically for use with free steering lines, or incorporate an independent line release mechanism. They must be able to release under abnormally high loading such as during a line - over malfunction, and exhibit no tendency to release prematurely.

Pilot Chute: The pilot chute is extremely critical. BASE pilot chutes are available in multiple sizes. Generally, the larger the size the shorter the delay for which it is intended. Because we deal with very finite amounts of altitude, it is best to err to the large size. In the following section is a table of typical sizes and their common applications. A pilot chute being used for BASE should be designed and manufactured with reliability and strength in mind. They are NOT over - sized skydiving pilot chutes.

Bridle: Bridles for BASE jumping should be at least 9.0 feet from attachment (or pin) to the pilot chute. This generates greater snatch force, which is critical at the low airspeeds typical of BASE jumping.

Equipment Configuration

DBS: Deep Brake Settings

Deep Brake Settings (greater than 80% of the effective control range) do far more than simply inhibit opening surge. By pulling in your brakes on deployment you are in effect lowering the canopy's aspect ratio and shortening the control lines making it harder for them to entangle or pinch part of the deploying canopy.

During slider down / off deployments, the lower surface experiences complete and instantaneous inflation before the airfoil even begins to pressurize. Packed with deeper brakes, most canopies will deploy in a more stable fashion, experience less oscillation due to suspended weight shifts, and have a reduced tendency to surge forward (which usually helps close off the leading edge due to the fact that the canopy hasn't acquired attached flow on its upper surface to stay open against external pressure).

In short, deep brakes make slider down parachutes open cleaner and more reliably. The convenient side effect is increased time to respond to an off heading opening.

However, deep brakes area very critical thing. It is easy to induce a stall on opening if the brakes are too deep. This is not a good thing and a smooth recovery is difficult at best. The ideal brake setting for slider down/off jumping is in fact so close to the stall point, that common sense dictates we err to the shallow side in order to leave a big enough margin to account for things like body position, altitude (MSL) and delay (which can all play into the equation). A brake setting ideal for slider down / off jumping will be too deep for slider up jumping. Ideally, a canopy should deploy with enough forward speed to allow for a riser correction immediately after opening. Some forward speed on opening is not a bad thing. It will in fact encourage on heading openings. Conversely, brakes set too deep can lead to a loss of control, which has potential for disaster.

Most BASE specific canopies can be delivered by the manufacturer with an approximate deeper setting already installed. However, every parachute is different. If you want to determine your ideal deep brake setting, you need to do your homework and determine where your stall point lies during test jumps from an airplane and move ahead from there. Contact the manufacturers for additional information.

Pilot Chute Selection

Pilot chute selection is critical. You should select a pilot chute large enough to open your container and deploy your parachute with altitude to spare. The negatives of an oversized pilot chute pale in comparison to the draw backs of an undersized pilot chute. We work with very finite amounts of altitude. The following table represents typical pilot chute sizes available today and their application. Specific sizes and designs will vary between manufacturers. Use this table as a reference and consult the manufacturer for specific recommendations.

Typical Pilot Chute diameter (inches)	Typical freefall delay (seconds)
46”	0 - 2
42”	2 - 4
38”	4 - 7
32”	7+

Sliders

Generally for freefall delays less than three seconds a slider is not recommended. When jumping without a slider either remove it entirely or secure it to the FRONT risers. There are valid arguments pro and con for removing the slider entirely or securing it down. Which ever method you choose be sure of your rational and your rigging.

When jumping slider down / off, always route the canopy’s steering lines outside the riser guide rings and slider grommets and use an appropriate BASE specific riser/ toggle setup.

The slider is a proven and efficient means of reefing or controlling an opening. They allow for proper sequencing and clean openings. As reliable as the slider is, it does introduce potential for a variety of malfunctions that can be avoided by deploying the canopy with the slider removed or secured to the front risers. The positive attributes of the slider outweigh the negatives as free fall delays exceed three seconds. Typically a mesh slider will be used for delays from three to approximately 7 seven seconds and a sail slider for delays from 7 seconds to terminal velocity. When configuring equipment for use with a slider, be sure to route the steering lines through the slider grommets and the riser guide rings. Do not deploy a slider up canopy with free steering lines.

It is important to control the slider during deployment. This is best accomplished by using a deployment device that will prevent the inflation of the canopy until all lines are deployed and tensioned such as a tail pocket with a primary stow, a diaper or a sleeve. It is also possible to physically control the slider by stowing it in a rubber band attached to a centrally located line attachment.

Technique

Site evaluation:

Site evaluation is as much a science as an art. There are many variables to be considered and addressed at every site. Generally, the principal areas of concern are available altitude, potential for object strike and landing area(s). The constraints these variables present will determine the exit point and freefall delay and hence equipment configuration.

Often altitudes are published in maps or other resources. For approximate altitude determination a rock drop can also be employed. Drop several rounded dense stones from the exit point and watch for impact timing their freefall. This will help in determining a cliff's profile as well as it's altitude. Using the formula: $Y=1/2(gt^2)$ solve for Y.

Example:

Y= height (ft.)
g = constant for gravity 32 (ft/sec^2)
t= time (sec)

A rock drop takes exactly 4 seconds. We would calculate this as follows:
$Y= 1/2(32x4^2)$ or 1/2(32x16) or 1/2(512) thus a 4 second rock drop = 256 feet.

Rock drops are only an approximation and have very little accuracy beyond four seconds. However, they are valuable tools for verification of approximate altitude.

NEVER drop rocks unless you are sure the ground below and even the cliff face is clear of people or property.

Exits:

The exit is one of the most critical elements to any BASE jump. A good exit will help insure a stable freefall and good body position for deployment. Most exits are made from a standing position.

Take a stance with feet about shoulder width apart. It is critical to leave the object head high. Focus on pushing up more than out. All forward momentum created by your exit will translate into rotational movement about your center of gravity. In other words, the further forward you push the more upward you must also push to avoid going head low. Think of leaving the object with a body position similar to one you may have if you were to drop to your knees while jumping on a trampoline. A common error of new BASE jumpers is to rotate forward prior to actually exiting. This lower attitude almost guarantees a head low exit.

Generally a head low exit is not so severe as to need any corrective action. However, in more extreme cases vigorously drawing the knees to the chest will help counter the forward rotation and bring the jumper level for deployment.

Running exits are similar to standing exits, however due to the increased forward momentum; the jumper must compensate with a more deliberately upward push. Foot placement is also critical and should be paced off to help timing.

Free fall and deployment:

Learn to accurately count your freefall delay as well as develop a sense for relative airspeeds. An arched, relaxed slightly head high position is ideal for both freefall and deployment. When deploying the pilot chute toss it vigorously to the side with enough force to clear your burble and easily enter clean air. Avoid the temptation to throw it

violently. This can lead to several problems: All the excess energy imparted to the pilot chute will encourage pilot chute oscillations and subsequent off – heading openings. Moreover, a radical arm movement can impart motion to the freefalling jumper and cause a slight rotation. Do not look over your shoulder at the deploying canopy as this can result in a lowered shoulder and an off heading opening.

Canopy Control

Off heading openings:
All off heading openings should be corrected immediately. A rear riser correction is preferred to correct off heading openings. Toggle turns are not advisable, due to the time that may be lost during locating and unstowing. Plus the forward speed of the parachute will increase as soon as the brakes are unstowed. Front riser turns are not recommended because both forward speed and decent rate will increase during any front riser input.

Over input by the jumper on rear riser with brakes stowed, can have dangerous effects. A parachute after opening with brakes still stowed will have a slow forward speed compared to one in full flight. This reduction in forward speed reduces the lift being created by the airfoil. During the opening stages of the deployment the airfoil will be lightly pressurized. This light pressurization and reduction of lift will contribute to the ability for the jumper to over input and stall the parachute. All of these factors are amplified when a deep brake setting is used. Do not over input and stall.

Stall and Stall Recovery:
A stall occurs when an airfoil stops creating lift. A stall may occur with input from either toggles or rear risers (a stall may even occur with input from a single rear riser). A riser stall requires far less input than a toggle stall. During a stall forward speed will decrease and rate of decent will increase. Directional control during any type of stall will be very difficult.

Stall recovery can be initiated by reducing controlling input (toggles or rear risers) thus allowing the parachute to fly in a forward direction. Abruptly raising the toggles or risers may cause the parachute to surge forward. A parachute is most stable and predictable in a ¼ to ½ braked configuration. If possible return the toggles to this position after initial stall recovery to promote end cell inflation and slow forward speed.

Flying in brakes:
Most sites and good accuracy landing approaches require a parachute to be flown in the middle control range. However, some flight patterns may require a deep brake approach. Deep brake flight will require the parachute to fly very close to its stall point. A stall may occur when the jumper initiates a turn by pulling one toggle deeper. A better solution for this type of deep brake turn is lifting one toggle, which will turn the parachute in the opposite direction and avoid a stall.

Landing Approaches:
A good landing approach must start on the ground, ideally when walking the landing area. Approaches should be planned to allow for an into the wind landing. Some landing areas will allow for the conventional approach, down wind, cross, final. This type

of approach gives the pilot the opportunities for adjusting the plan slightly in flight by lengthening or shortening any portion. However, this type of a flight pattern is not always available. It is very important to have a flight plan for every jump. It is equally important to have a plan for every type of opening. An opening that is off 120 degrees right may have a different flight plan than one that is on heading. Moreover, a 90 degree left may have an entirely different landing area. When planning a landing approach have predetermined " check points". These are imaginary points that can give the jumper indications if the flight pattern is working as planned. If a " check point" is entered to high then the pilot may wish to sink the parachute to make the next "check point". Or in some extreme cases missing a "check point" may mean aborting plan "A" and landing in an alternate landing area.

PLF- Parachute Landing Fall:
A PLF is the best way to distribute the landing force in an attempt to avoid injury. The proper body position for a PLF includes the jumper holding his feet and knees tight together with his knees slightly bent, the thigh muscles tensed. The jumper should roll with the landing trying to distribute 20% of the landing force to each of the following points of the body:

- The feet
- The side of the calf
- The side of the thigh
- The side of the buttock
- The side of the back

Never stick arms or legs out in an attempt to "catch" oneself during any type of landing fall. Allow the body to take landing impacts.

Problems and Malfunctions

Line twists:
Proper equipment and good exit and packing techniques have reduced the incidents of line twists. A slider removed parachute is less likely to get line twists than a slider up deployment. Line twists can occur during different points of deployment; during canopy lift or line stretch, during inflation / pressurization or the jumper may be spun under an inflated parachute. Regardless on how it occurred it could be very serious. As with any fixed object jump, parachute heading is a high priority. In the event of line twists the jumper must first return the parachute to a safe heading and fly away from the object or fly toward the landing area. This can be achieved by climbing above line twists and correcting the heading by pulling on the rear line group on the desired side. After a safe heading has been achieved, line twists can be dealt with in a normal manner by kicking and spreading of the risers.

180°
A parachute that opens 180 degrees off heading is flying back towards the object. This type of problem must be dealt with immediately. It is recommended to make this type of immediate correction by using rear riser correction while brakes remain stowed. The jumper / pilot should place hands on both risers ready to turn either direction and may apply a small amount of input on both to reduce forward speed. Then letting up on one and inputting on the opposite to create the desired turn. Thus, turning away from all obstacles and toward landing area or entering flight plan. Over input at this time may

create a stall. "Backwards flight" is not recommended. "Backwards flight" is not an accurate term in fact it should be called "backward stall". A parachute that is moving backwards is stalled. The decent rate will increase during a stall and jumper may run out of altitude quickly. Refer to stall and stall recovery in this manual.

Line over:

A line over malfunction is caused when a parachute inflates with a control line (brake line) over the top surface of the parachute. The line may come all the way over the nose or it may come off an end cell. The type that does not make it over the nose will usually slide off during inflation. This type of malfunction has a remedy that must begin with equipment set-up. The set-up remedy is the Line Release Mod. developed by Mark Hewitt. The Line Mod is to be used with slider removed or slider down deployments only. During slider- up deployments the control lines must pass through the slider grommets and the keeper rings on the risers. The line mod allows the control line to be released completely during a line over malfunction. It is recommend that the jumper release the brakes and "cycle" (pull both toggles down to approximately 3/4 brakes) them once in an attempt to clear the line over. If the line over remains, throwing the toggles to each side will allow the line over to clear. The process of cycling and preparing to throw must be practiced and become one fluid action. All flight control from this moment on will be accomplished using rear risers. Rear riser flight is different than toggle flight. Toggles only control the trailing edge of the parachute, however rear risers control the rear half. Rear riser input should be handled lightly both with turns and flare. Rear riser flares will tend to fall off quickly if over input is applied. A gentle flare can reduce a lot of the decent rate, however much of the forward speed remains. Prepare for a good PLF. Do not attempt to keep the non - offending control line. Flight with one toggle and one rear riser not recommended.

Factor that increase potential for a line over:

- Slider down or removed deployments
- High aspect ratio canopies
- Poor body position during deployment
- Poor packing techniques

Canopy damage:

The possibility for a damaged canopy can be reduced by complete and frequent equipment inspections. The jumper must also know the limitations of the equipment. For example: Do not exceed a 3 second freefall delay with out a slider. However, the possibility to damage a canopy during deployment remains. If damage does occur, a control check can be accomplished by doing a turn in both directions and a practice flare. The jumper must determine if they will be able to execute the flight plan. It may be necessary to land at a predetermined alternate site. A water landing can sometimes be a good option for a troubled parachute. Fast moving water, such as rivers, should be avoided unless support boats are in the water and ready for pick up.

Night Jumps:

A night jump is defined as any jump that takes place between one hour after sunset and one hour before sunrise.
Night jumps can be challenging, educational, rewarding and fun, but they require additional training and increased care. As with all types of jumps certain consideration must be made to keep the highest level of safety. Due to typically calmer wind conditions night jumps with good visibility can be as safe as day jumps.

It is recommended each jumper make at least one jump from the desired exit point into the desired landing area during the day prior to attempting a night jump. During this day jump the jumper should pay close attention to any obstacles that may not and probably will not be visible during night jumps. The jumper should also walk the primary and alternate landing areas during both day and night conditions.

Generally, parachute landings need some light to maximize safety. This light may come from a natural source, the Moon, or other sources such as flashlights, chem. lights (non-flame type), or vehicle head lights. A full Moon or near full Moon is an excellent source of light for night jumps and may not need any other source providing there are clear skies. If a vehicle's headlights are used, do not position the vehicle so the jumper has to land facing into the headlights. This has a blinding effect on the jumper and can ruin good night vision. It is better, however, to have the jumper fly over the vehicle and land with the light. In this case the jumper and someone sitting in the driver seat would be facing the same direction, which should be into the wind.

It is important for any light source to be safe and not cause other problems. Flame type light sources including road flares must not be used. They create a melting hazard for all parachute equipment and a brush fire hazard to surrounding foliage. Do not use open flame, pyrotechnic, or road flares as a light source.

The visual senses are greatly impaired by darkness. Be thoroughly aware of night vision problems. To maintain proper night vision a jumper should avoid looking directly into any bright light source for 20 minutes prior to engaging in any night jumps. Looking at headlights, into flashlights, and even at flames from campfires or lighters will significantly reduce night vision potential. Depth perception is a common problem with night jumps primarily during landing. Avoid fixating on the intended point of landing. Use of ones peripheral vision is key to enhancing depth perception helping to make a timely landing transition. The jumper should scan the horizon for depth perception cues. It is important to stay mentally focused on the landing task and fly conservatively. Always be prepared to perform a PLF.

After landing it is important to clear the landing area for any other jumper that may be landing. Confirm the safety of all jumpers at a predetermined point immediately following the jump.

Extra equipment may be necessary for night jumps. A small flashlight may be handy for gear checks at the exit point. It also comes in handy for departing a dark landing area. Extra clothing may also be needed for local conditions and temperature may change once the sun has set. Approach and departure times may be extended due to low or no light, so plan accordingly with food, water, and clothing.

Water Landings

Water landings can be categorized into two types.

Intentional water landings: The jumper determines that a water landing will be made before exit.

Unintentional water landings: The jumper determines a water landing will be made after exit.

Water types can also be categorized into two types.

Water landings made into moving water, such as river

Water landings made into non-moving water, such as a lake

It is important to understand the differences as well as the similarities of each type of landings.

It is common for cliff (or fixed object) jumps to take place over or near water. It is recommended jumpers be familiar with the benefits as well as the hazards associated with water landings. Open bodies of water such as lakes may have minimal landing obstacles depending on the specific geography. However, whenever a jumper lands in water, the possibility of drowning is exists.

A jumper should be familiarize himself with any landing area before the jump is made by "walking" the landing area. This includes a water landing area used for intentional and unintentional (or alternate) landing area. During this preview of the landing area note obstacles in and around the water, depth of the water, temperature of the water (understanding the possibilities of hypothermia in cold water). In the case of moving water the jumper must familiarize himself with down stream obstacles such as rock, trees, rapids, water falls and take note of any egress points.

Floatation equipment for non-swimmers must be used for any intentional water landings. Floatation is highly advisable when jumps are made over large or fast moving bodies of water without boat or rescue crews.

Landing in water should be done with a great deal of care. Never cutaway or release the parachute before entering the water. A typical (flare) landing should be attempted with feet and knees together. Never assume the water is deep enough for a no flare, butt first landing, it may only be six inches deep. Prepare for a PLF.

Water landings should be made with an attempt to keep the jumper clear of the parachute and its lines once the parachute settle into the water. Therefore if a landing is made into a river attempt to land perpendicular to the flow of the river to prevent the parachute landing up stream of the jumper the parachute and its lines will be pushed back into the jumper possibly impeding his ability to swim. A typical flare into deep water (or water that will allow the jumper to become completely submerged) will cause the parachute to land directly on top of the jumper. In this case a half brake landing may be useful in an obstacle free landing area.

The jumper should also attempt to land close to the shoreline providing it is clear of obstacles. Landing in the middle of any body of water (river or lake) will only make for a longer swim to safety. When a pick up boat is available landing relatively close to it is advisable. Never attempt to land in the pick up boat. DO NOT PANIC. A panic response to any water landing will increase the possibility of drowning. The jumper should get out from under the parachute (in the event it landed on top of him). Rapid leg movement may increase entanglement with the parachute lines. Cutaway the main parachute

and remove all equipment that will impede swimming such as harness container with reserve, belly packs, etc.

In some situation the use of a pick up boat may be needed. It is important that a pick up boat be agile enough to respond in an emergency (large clumsy boats are not recommended). Powerboats have certain benefits but are not always the ideal boat, for instance kayaks can be quite useful in small fast moving rivers. A shore line crew may be useful in some situations and may either compliment boat crews or may be adequate by themselves. All boat or shoreline crews must be briefed on the jump operation as well as parachute equipment including cutaway handle, reserve handle and RSL lanyards. Boat handling and pick up skills should be thoroughly briefed and practiced by support crews and jumpers before jumping begins.

Retrieving the parachute from the water must remain a low priority and never attempted until the jumper is safely out of the water. Once the jumper is safe, removing the parachute can begin. Removing a parachute from the water, if done wrong, will be difficult if not impossible. Never attempt to remove a parachute by pulling on the harness or risers or the suspension lines. This action only inflates the canopy under the water making it impossible to remove from the water. The best removal technique is to pull the bridle and pilot chute out first followed by the canopy and lines with the harness last. With ram-air, square, parachutes the control lines and or tail can also be used effectively to remove it from the water. Remember the pilot chute will want to inflate in the water.

If an intentional water landing is assured the jumper may opt for personal equipment (wet suit, boots, pads, etc.) that is better suited for swimming. A wet suit provides both warmth and some degree of flotation. The jumper should become familiar with the options for easy removal of the parachute harness including hardware options and chest strap routing for intentional water landings. If a water landing is not assured the jumper must evaluate for himself where is he most likely to receive injury and dress / prepare himself accordingly. Jumpsuits, boots, belly packs, and clothing must be considered when determining a swimmer's effectiveness in an intentional or unintentional water landing.

A jumper must review his procedures for all types of jumping conditions including water landings. Practice emergency procedures and removing parachute equipment for water landings. An efficient, relaxed handling of water landings is imperative to survival.

Ethics

Ethics is a broad and controversial subject. As BASE jumpers we exist under a stigma created by years of misunderstanding and misrepresentation. It is only recently that the general skydiving population has excepted BASE jumping as a positive thing. The general public and authorities are still uninformed and quick to draw conclusions and make judgments.

Adhering to a few simple principals will make the sport better for everyone.

Respect our environment. Do not leave trash on trails, at exit points or in landing areas. Clean up after yourself.
Adhere to local trail use guidelines. Don't be the one who forces restricted access to back country areas.
"Take only memories, leave only foot prints".

Every BASE jumper is an ambassador of the sport. Conduct yourself professionally. Do not damage other's property in any way. Treat back country areas properly. If you are caught trespassing be polite and cooperative and be prepared to pay a fine based on local codes.

Treat BASE sites with respect. Flagrant or reckless exploitation of sites will only reduce the already limited number.

When visiting an area, check with local jumpers to get the relevant information to safely and discretely jump at the local sites without causing problems.

Promote the sport through education and professionalism, not self - promotion.

The CJAA Wishes to thank all the volunteers who have devoted their time and energy toward the future of Fixed Object Jumping.

The CJAA is an organization for BASE jumpers by BASE jumpers. Your input and comments are always welcomed. If you have suggestions or ideas that could enhance this manual or growth of the organization please feel free to contact us at any of the numbers listed in the front of this manual.

"The Edge... There is no honest way to explain it because the only people who know where it is are the ones who have gone over."

Hunter S. Thompson