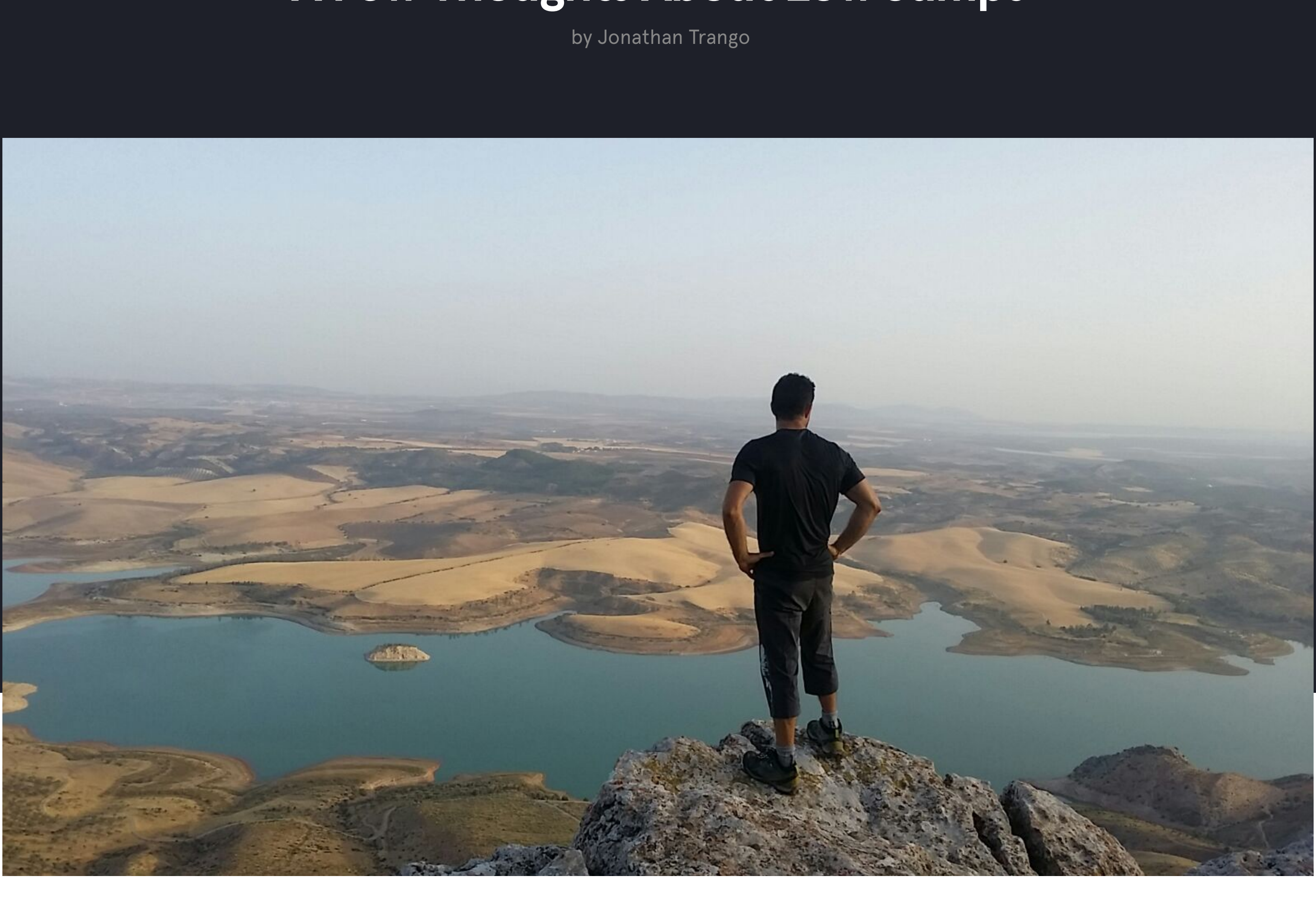
A Few Thoughts About Low Jumps

by Jonathan Trango



I would like to start by saying I may not be the perfect person to write about safety in our sport. A person with thousands of jumps from hundreds of different objects and many years in BASE definitely knows more than I do. My experience isn't that profound. Nevertheless, I have decided to share my thoughts, because I've witnessed too many people, including myself who didn't analyze their jumps well. In light of that they took more risk than necessary without even realizing it.

If this article can help someone to jump safer - I'm a happy man.

Of course, BASE-Jumping is not an exact science. All that I have written here is based on my experiences over the years, and sometimes no more than my personal opinion. I would also like to mention that you can't eliminate all the risk factors in our sport. Writing this doesn't mean I know how to jump 100 percent safely. At any given moment, anything could happen to me, but this will not make these thoughts less valid.

Aviation and Russian roulette

BASE-Jumping is a sport combining two very different things: Aviation and Russian roulette. For me, aviation represents the core of our sport and what it needs to aspire to. At its inception, aviation was very dangerous. Only with intense studies, education and science did we start to take control. Today, flying in an airplane is the safest means of transportation. Russian roulette, on the other hand, is based on pure luck. If luck is not on your side, you die. Every one of us has to decide where he wants to put himself between these two things, but one thing is clear: The more we analyze our mistakes in a scientific way, the more we get closer to aviation and the less we will depend on luck.

Evaluate every jump

When you open a new jump, it is normal that you analyze the site well. But do you do the same when the jump is already established? I always make my risk assessment as if I was about to open the jump myself. Just because it has been jumped successfully before doesn't mean it's going to work for me too. I want to make my own decisions.

Prepare for bad scenarios

I want to prepare myself for the worst, and I want to have a plan for those scenarios. Most of the time a bad scenario means having an off heading. But it could also be bad unexpected wind. Always think about the worst that could happen and be prepared for it. In your AFF they make you think about all possible malfunctions even though chances are small that you have to face all of them during your skydiving career. At the same time, BASE is far more dangerous, and most jumpers hardly think about the malfunctions, or the bad scenarios that could happen on every jump.

Altitude

Altitude is very basic information about a jump. We all want to have enough altitude to correct any type of problem occurring on opening in order to make it safely to the landing zone. For example, when you jump handheld from an 80m (260 ft) building and you encounter a 180, you won't have enough altitude to steer away from the wall and perform a complete turn and do a proper flare - no matter how quick you are. Today most jumpers would go handheld from 80m (260 ft), but I know of 5 cases where people were unable to perform a complete turn from a 180 properly, and it resulted in an injury. Of course, there are many factors that need to be taken into consideration (wing load, wind, brake settings, etc.). But for me, 80m (260 ft) is the threshold. I only jump handheld from 85m (279 ft) and higher. Then I know that I can recover from a 180 in time.

If I still would like to go handheld from a 80m building, I have to accept that a full recovery from a 180 is not possible then I have to ask myself if finishing just half of the turn is enough to land safely on both sides of the exit. If the answer is no, I will just use a static line to have more height.

But there is more: Do I have good landing zones on both sides of the object? Is there wind? Where is it coming from? The key to a good assessment of a jump is HAVING A PLAN FOR ANYTHING THAT COULD POSSIBLY GO WRONG. We have to think more about the risk factors instead of assuming that everything will be fine. If we do that, we will be more conscious about the jump, and in case of a bad scenario, we will have a planned mediated response which will probably be far more effective than an improvised one.

My personal experience taught me that jumping stowed from 100m (330 ft) isn't wise. Again, you won't have enough time to recover from a 180. Just as bad is jumping slider up from 200m (660 ft) - openings are horrible and chances of an off heading are huge.

Here is what I believe in:

30 m - 84 m	98 ft - 275 ft	Static line, Pilot chute 48
85 m - 110 m	279 ft - 361 ft	Handheld, Pilot chute 48
111 m - 280 m	364 ft - 919 ft	Stowed, Pilot chute 42
281 m and higher	922 ft and higher	Slider up, Pilot chute 36 or 38

Of course, if you jump from a mountain that has a very steep talus, or if there is a perfect landing field, you can adapt these rules. Every jump needs to be evaluated differently.

Delay

A long delay is, in my opinion, a good delay. If you don't take a proper delay, your opening sequence takes too long and it is more likely that you will have an off heading. This is even more apparent when there is a bit of wind. The extraction is faster, and a bit of wind doesn't affect it. Don't take less than a one second delay when jumping handheld. You don't gain altitude; it only increases your chances of having a bad opening. For stowed jumps, you shouldn't pull before 1.5 seconds - 2 seconds would be better.

Brake settings

We have talked a lot about brake settings in the past. About how to set them and make them perfect. I won't dive into that. But how do the brake settings affect our evaluation of jumps? It's quite simple: if my canopy is set in deep brakes, it doesn't open in a stall, and sinks nicely without forward speed, it will give me more time to recover from a 180 but I will lose more altitude during its opening. On the other hand, if my canopy, still in deep brakes, opens with some forward speed (normal with many factory settings), it will leave me less time to recover from an off heading, but will lose less altitude during the opening. We need to know our canopies well and think about them when jumping new objects. If my canopy does not have proper brake settings, and the wall is a bit positive, it will be impossible to recover from a 180. On the other hand, if on a jump, reaching the landing is tight, a correct brake setting will worsen the odds of making the landing area.

180

The most important lesson I've learned about 180s? Never stop practicing reaching the toggles/risers as well as correcting a possible off heading as fast as you can! Do it on skydives, from bridges - whenever you can! Have your brake settings dialed in - that will give you more time, AND it is also very important to push hard on the exit! Pushing hard, or not so hard, makes a huge difference in the separation you will get from the wall during the opening sequence.

When you start jumping, a good body position is more important than a good push. But once you trust your body position, you should try to break the long jump world record! Especially on low jumps. At the end we should all know our limits and the jumps we CAN safely do and the ones we SHOULDN'T do.

Landing

We all know how to evaluate a good landing field. But trickier is to evaluate if we can reach the landing field in cases where it's not clear how far away it is. When I analyze a new jump, I measure the horizontal distance from the exit to the landing. I subtract the altitude which I will lose in free fall and calculate the necessary glide that I need to reach my landing field. A BASE canopy flies with an average glide ratio of 2.5. If the mandatory glide is more than that, I know I won't make it. If the mandatory glide is 2, I know I can get there easily. If the glide is between 2 and 2.5, I know that my flight under canopy needs a tail wind.

How much altitude do you lose in free fall?

Static line	Canopy opens after 15m (50 ft). Canopy fully inflated after 25m (82 ft)
Handheld	Canopy opens after 35m (115 ft). Canopy fully inflated after 45m (148 ft)
Stowed	Canopy opens after 50m (164 ft). Canopy fully inflated after 60m (197 ft)
3 seconds delay	Canopy opens after 70m (230 ft). Canopy fully inflated after 80m (262 ft)

These numbers are not 100 percent accurate, but they can help you calculate your jump with a margin of safety. And of course, we have to think about possible off headings too. We lose more or less 40m (131 ft) to recover from a 180. If I calculate that I cannot reach the main landing area when having a 180, I have to find an alternate one. If there isn't a viable alternate landing, I would prefer to jump with a static line where I have good chances to have an on heading opening.

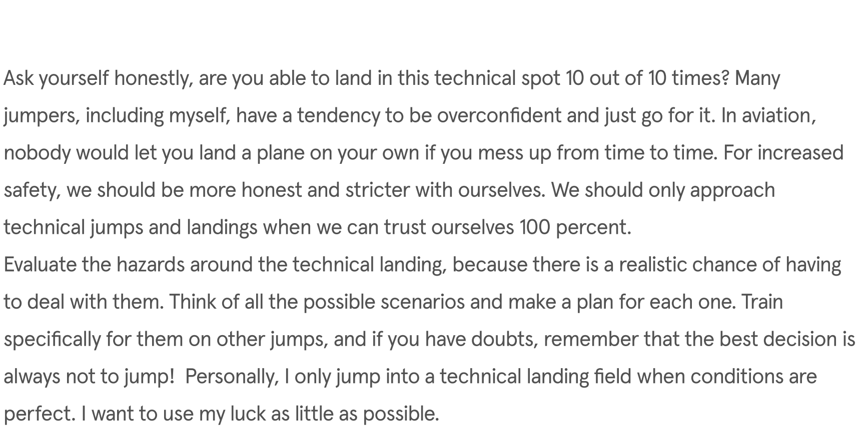
When I can't reach the landing field

Most accidents in BASE-Jumping happen during landing procedures. Most of these accidents happen when people have to land where they didn't plan to. Landing out is not uncommon, but at the same time, this is when most injuries occur. When I started jumping, I often landed out and was overconfident about my abilities until I sprained my ankle on a bad landing, and I couldn't walk properly for two months. Since then, I think more about alternative landing fields. If you're going to have an injury one out of every 10 times you land out, you should reconsider those odds and spend more time thinking about good landing spots. Nothing is a better lesson in BASE than a minor injury. You get reminded of the real danger of the sport and you have time in bed to think about your mistake and to think about how you could have avoided it. Nobody analyzes their mistakes as properly as an injured person! This last sentence is actually so true, that I use it as a safety trick. If I make a mistake, or planning error, and nothing happens, I don't forget it. I use the experience to imagine myself injured in bed for six months, and how I could have avoided the mistake. In my opinion, this is a great way to learn.

With every mistake you walk away from, you learn more about safety and how to stay alive. What is important is to analyze why things went wrong.

If I realize while I'm under canopy that I have to land out, I will choose an alternative area, but I will focus on wind. Remember, when landing out, it is easier and safer to land against the wind in a worse area, than trying to land in a better area with tail wind.

Technical landings



Ask yourself honestly, are you able to land in this technical spot 10 out of 10 times? Many jumpers, including myself, have a tendency to be overconfident and just go for it. In aviation, nobody would let you land a plane on your own if you mess up from time to time. For increased safety, we should be more honest and stricter with ourselves. We should only approach technical jumps and landings when we can trust ourselves 100 percent.
Evaluate the hazards around the technical landing, because there is a realistic chance of having to deal with them. Think of all the possible scenarios and make a plan for each one. Train specifically for them on other jumps, and if you have doubts, remember that the best decision is always not to jump! Personally, I only jump into a technical landing field when conditions are perfect. I want to use my luck as little as possible.

Margin of error

Leaving as much margin of error as possible is the key to staying alive in BASE. But what does that mean?

Margin of error is, in my opinion, very subjective, and depends more on the jumper than on the jump itself. If you need two seconds to reach your toggles after opening, jumping a vertical cliff is dangerous for you. You have no margin for error. Get experience on easy jumps until you can jump vertical cliffs with a safer margin of error. If you can land on tiny targets every time, then you have a good safety margin for landing in a field with a radius of 10m (32 ft).
Leaving margin for error means, first evaluate the jump correctly, and all its possible scenarios, and then evaluating your capacity to deal with these scenarios. Make sure that you can deal with all of them safely and consistently.

It is very important that we thoroughly analyze the jumps and what could go wrong. But it is just as important to be self-critical enough to understand what we can and can't do. Know your limits!

The BASE Fatality List indicates that many people have lost their lives because they didn't properly evaluate their ability to make a jump, flight or a maneuver. "They have tried things they weren't 100 percent capable of": this is the most common reason for all the accidents that occur. It happens to beginners on easy jumps and to experts on highly technical jumps, but the reason is the same. We have all lost friends because they didn't prepare themselves enough. It's painful to acknowledge but WE HAVE TO THINK MORE! We have to know ourselves better! Let's not depend on pure luck. In aviation, people spend a lot of time and money investigating things that could have led to an accident. We should do the same in BASE!

If you evaluate a jump and you come to the conclusion that there is no margin for error, you shouldn't jump. If you still do, you're stupid. And we're all being stupid from time to time, but at least we should KNOW when we do stupid things.

Jonathan Trango

Jonathan Trango is a passionate climber and BASE-Jumper living close to Málaga.
He opened many jumps in Spain - most of them slider down.