

DISCLAIMER: This is by no means a complete guide on how to perform a complex and potentially dangerous aerobatic maneuver under a speedwing as this short compilation lacks vital and required detail information of the specific circumstances the maneuver is executed in.

See these words as what they are - a starting point - but be aware that specific wings or special circumstances (e.g. very light or very heavy pilots, very roll dampened wings etc.) may turn this maneuver into a very dangerous or even deadly undertaking.

BEFORE READING ON, PLEASE WATCH THE EXAMPLES BELOW IN ORDER TO BE FULLY AWARE OF THE CONSEQUENCES A BADLY EXECUTED BARREL ROLL WILL HAVE.

Here is **an example of how quickly a nice barrel roll can end in a disaster** if you stallspin the wing

We would like to explicitly thank the pilot for being generous enough to share his error with us, he says in his own words:

" I posted this video to help other friends-speed riders not to make my own stupid mistake. I did not have the ability to perform a barrel roll "a combination of a loop and a roll" - I am a helicopter, airplane pilot and skydiver, and for a moment I lost respect for this discipline, and humility to learn step by step . I was very lucky I only suffered a blow to the left shoulder and small bruises on my face. I apologize to all my friends and and my family. Next year I'll be ready to start again with humility my journey of student-Speed ☐☐ rider. Thanks Stefano "

{youtube}yzQyvJNgx2I|960|540|1{/youtube}

The next one shows the outside perspective of a similar incident.

Dont be fooled by thinking it won't happen to me.... IT EASILY CAN HAPPEN TO YOU if you don't learn how to execute it properly, in the right conditions, with the right airspeed and the appropriate control inputs for your wing, wingload and swingweight combo - **it takes zero experience to bury one brake, it takes a lot of experience to do it right and safe.**

If a **barrel roll goes wrong** it looks like this and i doubt you will have as much luck as armin had (it is a true miracle that he survived) [stallspin](#) (3:50 onwards)

This one also **shows how fast things can go wrong** if you add too much brake with too little airspeed (intentional demo of how a speedwing reacts to aprupt brake input at low speeds).... [stallspin 3](#)

IMPORTANT REMARK REGARDING THOSE THREE VIDEOS: As you can see its nearly impossible to control a spinning speedwing, initially the spin develops so fast that any counter reaction is simply beyond human reaction speed.

If you spin a speedwing you are a passenger and all you can do is put your hands up and let the wing fly and hope for the best as any input usually makes things worse (see armins crash - he crashed because he tried to control the wing via the brakes and fullstalled it in the process, would he have let the brakes up he most likely would have ended in a steep spiral, which he could have most likely flown away from with the remaining residue altitude)

If you dont feel ready for a potentially dangerous maneuver like a barrel roll, then please don't press yourself to perform it, don't waste your life for beeing a cool dude on youtube or vimeo - its NOT worth it.

In order to learn how to execute a barrel roll with acceptable risk the following steps have shown good results in real life. There are of corse many other ways to learn and execute a barrel roll, this is how we think it can be done with acceptable risk.

Enough Disclaimers, here's the stuff you came for, so lets get it on !

At first (at least for some ,-) shocking news: a barrel roll with a speedflyer is all, but surely NOT a barrel roll.

Why ? because your axis of rotation is between you and the wing, while in a true barrel roll (in fixed wing plane aerobatic terms) the axis of rotation would be ABOVE your wing- hance the name barrel roll as you fly a roll like you would follow the outer surface of giant barrel / cylinder.

So what usually is reffered to as a barrel roll (or roll, which it isn't either, as in a roll the plane rolls around its own center line) is in fact a horizontal spiral.

That may leave some confused, or even motivated to argue that, but it leaves us with a perfectly good starting point for learning it.

But lets not stress that too much and stick with the term "barrel roll" as it has established itself in our tiny little speedflying world for the maneuver we are talking about in this short article.

There are two main types of barrel rolls:

A.) the "flick" or "snap" roll

It reminds one a little bit of a snap roll (snap roll = a roll induced by applying elevator + side rudder and thereby stalling the inside wing) in fixed wing airplane aerobatics - in a speedwing its extremely fast, not on axis, usually with some amount of sat in it and more or less uncontrolled via the brakes and living mainly from the initial impulse via the brake, the partial stall of one wing and the swingweight of your body until the speedwing / pilot combo is level again

All three "how NOT to do it" videos in our intro disclaimer are "flick" style rolls, they are per se unsafe as there is too little or no pilot control during the maneuver and therefore should be avoided.

IT IS VERY IMPORTANT TO UNDERSTAND THAT A "FLICK" / "SNAP" ROLL WORKS BY STALLING THE INSIDE WING, THATS WHY IT IS SO QUICK AND ESSENTIALLY UNCONTROLLED.

A "SNAP" Roll is a short, momentary spin on one (the inside / lower) wing halve an this creates a wingload spike (double wingload) on the other wing halve developing an enormous amount of lift for a short period of time until (If you are unlucky / too slow) that wing halve eventually stalls due to too high wingload with too little flying speed.

Now have a second look at Armins and Stefanos Video with that knowledge in mind - and make sure you NEVER pull too hard with too slow airspeed and end up in such a situation as the positive outcome is purely based on luck and luck alone.

PLEASE MAKE SURE YOU PROPERLY UNDERSTAND THIS, SO YOU HAVE UNDERSTOOD WHY (!) IT IS SO INCREDIBLE DANGEROUS TO JUST PULL ONE BRAKE AND HOPE FOR THE BEST WHEN ATTEMPTING TO LEARN HOW TO BARREL ROLL A SPEEDWING.

B.) The "real" barrel roll (or horizontal spiral)

It is executed as a smooth maneuver in full control of the wing / pilot combo's flying path at all times.

Important: we simplified it into only two types on purpose, in real life there is a wide grey field in between A and B that blends one into the other - even within the same roll or series of rolls

Lets have a look at variant A first:

In its roughest form there are no skills required, any idiot can do it, just lean over, pull on one brake, put the other up and pray that you will not spin the wing.. that said not a very skilled or controlled maneuver, nothing to be proud of as a pilot, as the positive (= you are alive) outcome is purely depending on your wings qualities and in some cases on a good portion of luck.

Now for option B

B like Better - at least from our point of view - the one you want to learn as it looks smooth, stylish and will get you all those hot youtube and vimeo groupie chicks ;-)

ok, seriously, there are **3 main steps in the learning process for Option B:**

1st - learn how to execute a perfectly controlled spiral.

Most people attempting a barrel roll have never done this, nor think its necessary, but as a barrel roll is just a horizontal spiral its the logical and essential foundation of learning how to barrel roll in style and full control.

Target is to fly level, initiate a spiral absolutely seamles, smooth and with no big load spikes into one SMOOTH wide 360 degree spiral and come out level again

In order to acheive this you MUST use a controlled amount of counterbrake after initiating the spiral (as you also would in any "normal" paraglider spiral)

This way you get a very smooth, low G, constant turn- and decent- speed spiral.

The best way to perfect this kind of spirals is while soaring a bigger speedwing (14-16 sqm) in strong laminar winds - you climb 100m above launch, spiral down to the height of the ridgeline (in free airspace in front of the ridge of corse) and all over again - this allows you to perfect your timing and program your reflexes and nerve connections in a proper (= non stressful) learning environment.

2nd - the important in-between step

Now, after mastering step1 and feeling really good, free of fear and confident. When initiating your (now perfect) spiral dive gradually add some up front counter swing (steer to the other side before you execute the spirial in order to oick up additional momentum) and slightly quicken the initial input until the initial input sends you over the wing (horizon upside down) - during the first tries despite your own will your body / reflexes will most likely chicken out on you and you will end up in a spiral after you passed the upside down position as you loose too much momentum or unwantedly stop the wing from further rotation via the brake(s) as your body tells you "**body to brain: this is not right, we are flying uspid down with some strings and a piece of nylon**"

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Dont worry, this is OK, just step back and repeat what you have learned before, throw in a few spirals to calm down again and give it another try, dont force it, dont pull brutally on the brakes, it will come, give your body and mind the time to learn it, give your brain the time to handle that upside down stress - dont forget we humans are not made to fly - let alone be positioned upside down , -)

That said NEVER execute this maneuver with less then 200m above ground - if you end up in fast spiral or double spiral you will loose at least 100m until you are able to stabilize the wing.

Practice this dozens of times while soaring to literally hammer the right sequence of actions and counteractions into your brain and muscle memory.

Flying a barrel roll should now feel natural, smooth and NOT exciting to you - it must feel like a normal sharp turn in order to be safe (= your body must react like normal even if you are upside down)- **dont take that lightly - beeing upside down is very stressful for the human brain and it is very very easy to confuse left with right or up with down** ... talk to experienced aerobatic pilots how many YEARS of their lives they spent training their upside down flying skills...we don't need as much skills as they do as we fly upside down for such a short amount of time, but dont underestimate the risks of loosing positional awareness - the brain might need 1-2 seconds to recover that positional awareness which can be WAY to long if you execute a barrel roll close to ground.

DONT BETRAY YOURSELF with some "uh i made it" barrel rolls, practice, practice, practice until you feel as good and safe as in a normal direction changing turn - then you are ready for step 3.

3rd - Time for the real thing

= B-rolling while flying down in close or very close proximity to a mountain (preferrably not too close for your first tries in case your brain chickens out and you end up in a spiral ;-)

In level flight open up the trimmers 30 to 50% in order to get extra speed (= added momentum)

Then gently swing the wing to the opposite side to build up some extra momentum and execute a smooth not too fast barrel roll - you will usually fully rotate in less than 1.5 seconds and the horizon should stay EXACTLY in the middle of your field of vision (then you performed a really smooth horizontal barrelrollwhichisaspiralbutwewontstressthatfurther ,-).

Congratulations, you now have mastered the barrel roll, but as you are flying it in full control now, it's not nearly as exciting as you thought it would be - isn't it? .. anyway, welcome to the REAL world of 3D speedflying, **but don't get eaten alive by your newly acquired skills, you are in FULL control only as long as there is NO wind and no thermals present - so don't mess with mother nature, you will lose.**

Most common errors

.) No counterbraking

Remember you are flying a horizontal spiral, so in order to keep the wing on axis - contrary what you might think - in most cases with most wings (there may be exceptions to that depending on your wing) you need a bit of counter brake in order to compensate for that hard input that did send you over the wing - if you fail to counter brake you can end up in a poorly controlled snap roll / sat'ish kind of barrel roll that is mostly living from the swingweight of your body but not much from aerodynamic control surfaces.

So consequently you are NOT in full control of the wing and its angle of attack (which should be high in order to avoid a locked in barrel roll or a frontal collapse, so brakes should be applied in most cases) via the brakes.

If you don't use the brakes throughout the b-roll the wing pilot system rotates by a big amount only due to the initial (by your initial hard brake input) accelerated mass (your body) BUT the whole wing pilot system may enter a very low AOA (Angle of Attack) flying state = possible big fat bang if that gamble goes wrong e.g. the angle of attack of your wing is momentarily reduced

due to e.g. the turbulence of another wing flying in front of you and / or your wing accelerating fwd (due to releasing the brakes) while your body "drags" behind.

.) **Not watching the horizon**

A barrel roll is a true barrel roll if the horizon stays directly in front of your nose and seems to rotate like you would pull an aileron roll in an airplane - anything else is not a barrel roll and most important a sign of poor wing control - practice, practice, practice.

Some so-called / "claimed" barrel rolls on internet you see are unclear, poorly controlled, and of the "huh i made it" type, generally said leaning towards type A rolls - this is not your goal, this is just poor piloting with a lot of residue risk to hurt or kill yourself.

Additional, hidden dangers

.) **fat skis / ski position management** (big thanks to pilou for that remark)

Don't let your skis dangle from your feet without controlling their position at all times during a barrel roll !

Especially very wide (and sometimes also very heavy) Freeride skis can cause considerable drag and swingweight issues if they get exposed in a wrong angle to the oncoming air while flying a barrel roll.

The added drag and swingweight can induce a spin and / or induce a twisting motion to the pilot, in a worst case scenario resulting in a riser twist.

So in case you are using wide or very wide skis, make sure you keep them parallel and more or less in a 90 degree angle to your body by crunching your abdominal muscles while flying the barrel roll.

Samples

<http://www.schnellcraft.com/index.php/media/moving-pictures/162-south-side-solo-run>

At 1:55 into the movie you see an example for a smooth, wide and fully controlled airplane style barrel roll.

Main aspects to look out for are the constant rollrate, smooth, gradual, efficient, well timed steering inputs, the fully centered body position with no weightshift at all and the

flawless stabilisation and exit close, but not too close, to the terrain.

= thats how a well executed barrel roll should look and feel like from our point of view.

In contrast to our preferred style other pilots have developed different styles and some focus on mastering the most aggressive and fastest possible barrel rolls.

A true master of this variant of the barrel roll is for sure Valentin Delluc, but better don't try this at home until you are as skilled as Valentin ,-)

<http://vimeo.com/119970283> and <http://vimeo.com/89496269>

In this one <http://www.schnellcraft.com/index.php/schnellcraft/item/rockgarden-2> watch for the clearly visible counter- brake- reaction in the first b-roll about 0.1 sec after initiating the roll, also watch how smooth and airplane like the result looks (the second one is a locked in spiral not a roll, you can even see the point when it locks in and the pilot adds some addtl. counterbrake to keep it constant)

difference between a barrel roll (horizontal spiral) and a "normal" spiral from the pilots view <http://www.schnellcraft.com/index.php/media/moving-pictures/107-32-seconds> the first one is a barrel roll, the second one a spiral - notice how little the heightloss is during the barrel roll and how dramatic it is in the spiral

<http://vimeo.com/6272456> one barrel roll, one semi barrel roll and one spiral, again watch the difference in momentum and height loss as gravity starts to pull.

All sorts of barrel rolls, spirals and anything in between from different angles, you

should be able to tell the differences by now ,-) <http://www.schnellcraft.com/index.php/schnellcraft/item/chamonix-2011-teaser>

and

<http://www.schnellcraft.com/index.php/media/moving-pictures/106-disco-rollers>

And to [round things off](#) , the grandmaster of superlow b-roll mr. mal haskins (be aware that he is not only a very skilled pilot, but also a very big guy that puts a lot of momentum in the rotation and a lot of load and energy into the wing, also watch how he also uses counterbrake (as any skilled pilot does) to stabilize the wing, also read his words of warning.

Have Fun, use your brain, use a reserve, fly over ground as high as possible and dont kill yourself.

As usual: all the best from the schnellcraft crew

And NOW, let the good times ROLL - but do it RIGHT.

Links and further Information:

Under [THIS](#) link you can find an excellent Article in French from abovethepines.com including an very educative "how to barrel roll" [video](#)

- watch the video, its definately well worth your time :-)

