Chapter 1: A Magical Repertoire: The Techniques of High Performance Flying

If you are a good sport kite flier, we can help you be a better one.

There are certain basic skills that are used in all types of flying. Whether you are interested in competition, impressing your friends, learning a few tricks, or just feeling a bit more confident with that new high performance kite, practicing these techniques will help.

Before we start, there is one main point we need to emphasize. This is not a sport where brute strength wins. Pulling hard doesn't make the kite fly better. You can be vigorous. You can be extreme. You can be snappy. But don't be forceful. Fly with your head.

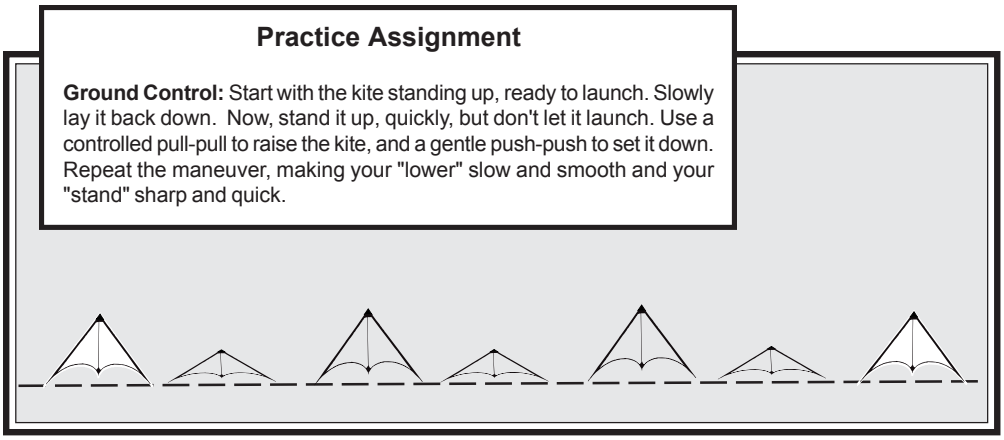
The best flying techniques are finesse, precision, and delicacy of control.

There are two kinds of flying - playing and practicing.

When you are playing, you do what you already know how to do. You stay within your limits and usually don't try anything new. You just go out there, take your mind off whatever may be bothering you, and... well... play! Practicing, on the other hand, takes concentration and effort. When you practice, you're focused on improving your skills. You try new things and work at doing old things better. You extend your limits, so that next time, you'll be able to play better.

Throughout this Chapter, we will introduce you to "Practice Assignments". Think of them as sport kite homework. Go out to the field and try them. Concentrate. Fly these assignments over and over until they become a regular part of your flying arsenal.

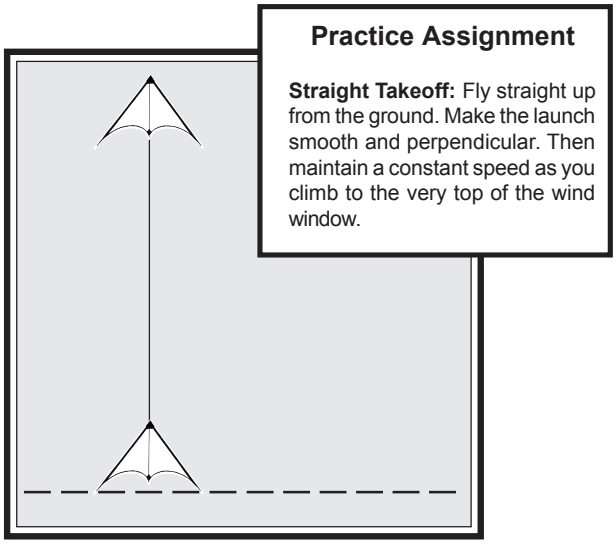
Then go play some more.



Technique #1: Leading Edge Launch

The Leading Edge Launch is actually a fairly advanced maneuver. But it is one you should learn early.

When you go out to the field, you want to spend your time flying, not walking back and forth from the handles to the kite to set up again after a landing or a crash. But how do you avoid this hundred foot “walk of shame”. Easy. Learn to recover and relaunch no matter where or how your kite has landed.



In a normal launch, the base or bottom of the kite is on the ground, perfectly positioned, perpendicular to the flying lines and to you. You just pull back evenly on both lines to launch.

If you have staked out your handles, the kite can be left standing with tension on the lines and the nose leaning back in the wind ready to take off.

And even if you haven’t staked the handles down, a gentle, steady pull on the lines will stand the kite up as the standouts and then wingtips make contact with the ground.

But not every situation is perfect.

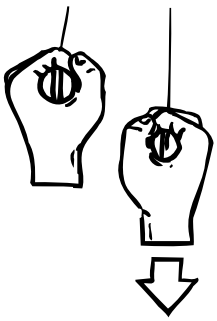
If your kite has come down unexpectedly, the chances are that it has nosed into the ground. That’s good. It’s good because you can learn to relaunch, nose down, from almost anywhere in the wind window . And with a bit of practice, you can even make it look like you planned the whole thing.

The key to a leading edge launch is to lean the exposed wing slightly forward, so that enough wind can get under the kite to lift it back into the air.

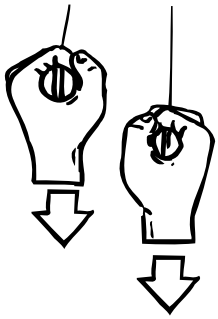
The kite should be toward the edge of the wind with its nose pointing toward the “outside” of your flying area - or away from the center. One wing should be on the ground and the other pointing toward the sky.

Gently draw back on the upper line so that the wing which is not on the ground begins to lean toward you. At the same time, it is important to keep some tension on the lower or ground line.

Don’t pull too hard - or the kite will “waddle” over onto the other wing and point back toward the center.



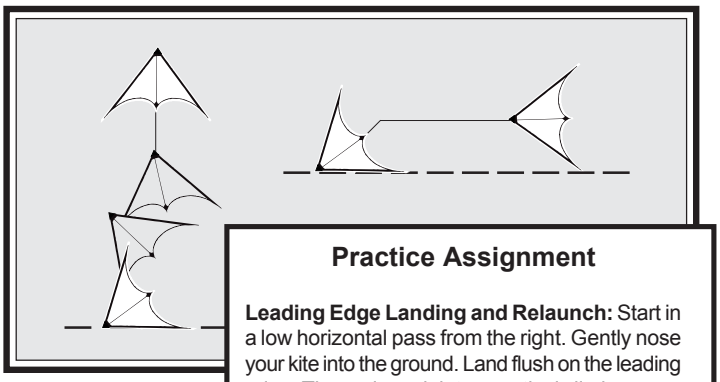
Pull Back Gently on the Upper Line to Lean Forward



Then Pull Back Sharply on Both Lines

Pull gently, and just hard enough for the wind to get under the wing and the kite. When the kite is leaning about thirty degrees, pull back sharply on both lines. At the same time, take a few quick steps backwards. This backwards motion will increase the force of the wind on the sail and sustain that increased pressure longer than your arm motions would have.

The nose should swing around into the air, and the kite should lift off. Congratulations!



Practice Assignment

Leading Edge Landing and Relaunch: Start in a low horizontal pass from the right. Gently nose your kite into the ground. Land flush on the leading edge. Then relaunch into a vertical climb.

If the kite has landed with the nose pointing toward the wind’s center, just tug on the upper line and “flop” it back the other way.

If the kite is too close to the center of the wind, you may need to walk left or right to create a better launch angle.

And please note that “waddle” and “flop” are not technical terms.

At first, you may find the wingtip dragging as you work to turn the kite back into the wind. But with practice, you’ll find just the right touch and be able to flip the kite skyward with no problems or unintended ground-touches. So practice!

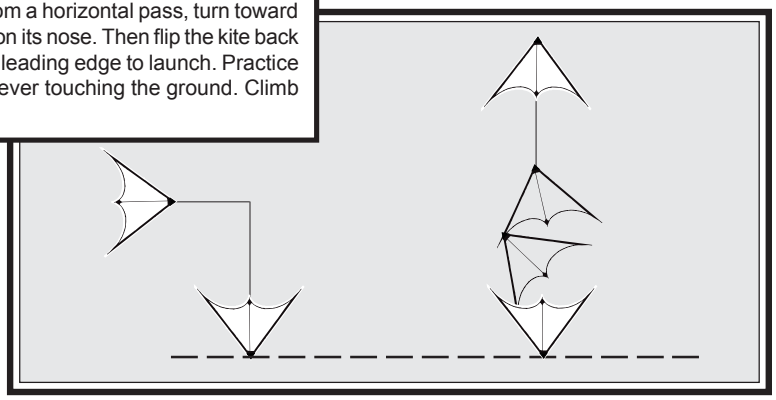
Leading edge launches are easier if you move the tow point on your bridle slightly toward the nose of the kite. Tune as if you were preparing for slightly lighter wind.

Bridle adjustments make a big difference in how your kite flies. When wind conditions change or you want the kite to respond differently, adjust the tow points. And remember to experiment with your settings whenever you try something new.

Get good enough with this recovery that you can do it anywhere downwind. Then your next challenge will be to perfect the relaunch by balancing the kite on its nose and then flipping it into the wind without touching a wing to the ground at all.

Practice Assignment

Nose Landing and Relaunch: From a horizontal pass, turn toward the ground and gently land the kite on its nose. Then flip the kite back into the air. Start by rolling onto the leading edge to launch. Practice until you can turn without a wing ever touching the ground. Climb straight up after the launch.

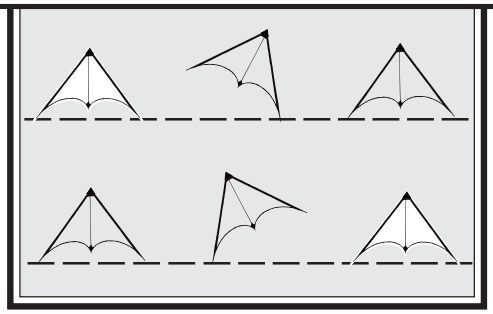


Once you perfect the Leading Edge Launch, about the only time you'll need to actually go to the kite is when it is face down with the nose pointing toward you or when the lines have become wrapped or tangled with the kite. And sooner or later, someone will figure out a trick to beat even that.

Advanced performers like to incorporate landings, ground work, and relaunches into their routines. But the leading edge launch is more than just a performance trick. It's a practical skill that every flier should know. Forget the “walk of shame”. In all but the most tangled situations, learn to get your kite back into the wind using your handles, not your feet.

Practice Assignment

Wing Tip Lifts: Start with the kite on the ground. Carefully adjust your line tension to lift and hold the left wingtip up off the ground. Lower the kite, smoothly. Now repeat the maneuver on the right side.



Technique #2: Straight Flight

There is a big difference between flying fairly straight, and flying really straight. That difference translates into points if you are a competitor, and into personal satisfaction if you are not. Besides, if you want to go anywhere with your sport kite, the quickest way to get there is a straight line.

Now before we begin, there are two things we are presuming about your equipment. The first is that your kite is properly tuned for the conditions and properly balanced as well. You haven’t done anything foolish like replaced a broken graphite spar with a heavier fiberglass one. That might make it a little hard to fly straight...

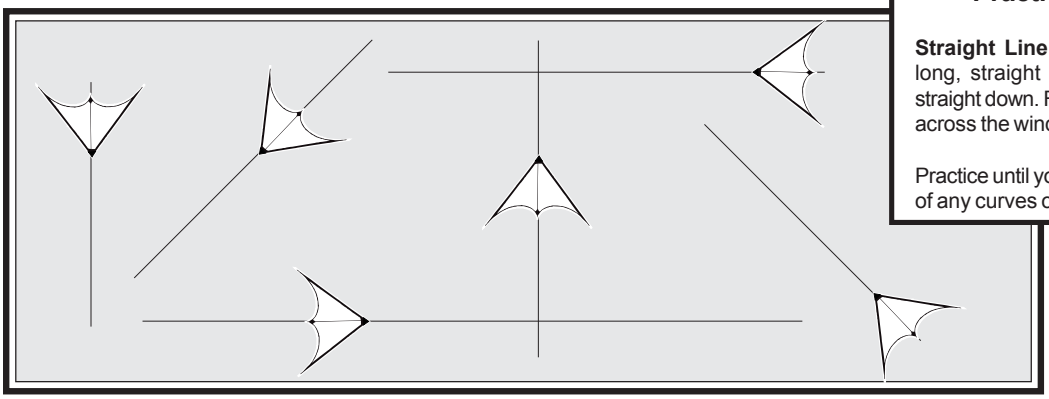
The other thing we presume is that your flying lines are exactly equal in length and that they have been pre-stretched so that one doesn’t “give” more than the other in flight.

The secret to flying straight as a ruler is really no secret at all. If the kite and lines are set up properly, then all you need to do is keep your hands locked in place. Don't steer once you have established your line. Your equipment will do the rest.

In practicing controlled straight flight, you have three goals.

First, you want to be able to fly vertically. This means straight up, and straight down. By now, you should be good enough that flying directly toward the ground doesn't intimidate you.

Your second goal is to perfect long horizontal passes. Start in the middle of the wind and work your way lower and lower until you are practically dragging a wingtip. And finally, practice flying diagonally across the wind at a forty-five degree angle.



Practice Assignment

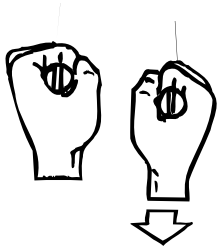
Straight Line Flying: Learn to sustain long, straight lines. Fly straight up and straight down. Fly horizontal. Fly diagonally across the window.

Practice until your lines are completely free of any curves or corrections.

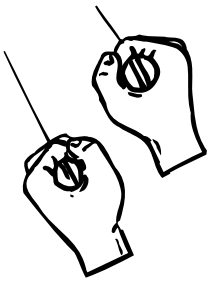
The other thing to remember is that flying straight doesn't mean that your hands will always be exactly even. In fact, about the only time your hands are even is in a vertical line directly in the center of the wind.

When you are flying horizontal, you need to offset the force of gravity. This means maintaining a very slight additional tension on the upper line. If you are flying to the left, you will need to pull back, almost imperceptibly, on the right line.

When you are flying vertically, you may not necessarily be in the center of the wind. Wind pressure will try to push you toward the center, so you need to compensate by steering slightly the other direction. If you are on the left side of the wind, you may need to steer slightly to the left. And the farther you are from center, the more you will need to adjust.



Pull-Back Slightly on the Upper Line in a Horizontal Pass



Rotate So You Face Your Kite

Finally, no matter what direction you are flying across the sky, remember to turn or rotate your body to keep your hands parallel with your kite lines. If you are facing left, and the kite is to your right, the kite is going to think you are pulling back on one line and will begin to move off that straight line. Facing the kite eliminates this problem.

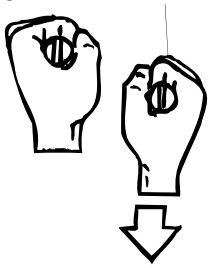
It's little things like these that make straight lines really straight.

Technique #3: Mastering Turns

Most novice fliers learn to steer by pulling on one flying line. It's basic: pull-right to turn right - pull-left to turn left. When you are ready to straighten out, you push back with the same hand. But the fact is, that pulling on the flyline is only one of the ways you can turn your kite. And the more ways you can make those turns, the more things you can do.

Let's take a look at each of our turning options.

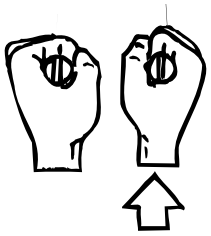
Pull-Push: The "pull turn" is the most natural and basic of turns. As we said before, a pull to turn, and a push with the same hand to recover is the way most fliers learn how to fly.



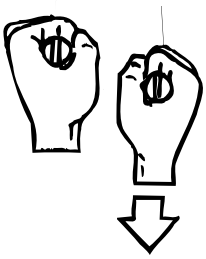
Pull-Right to Turn Right

The pull-push will result in smooth curves and strong, broad maneuvers. Pulling on the line increases power and speeds the kite into the maneuver. Pushing back slows the kite as it recovers. This makes the pull turn useful for curves and circles.

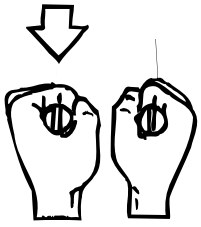
To increase the tightness of the turn, you can push forward with your opposite arm as you pull back on the turning side - much like steering a bicycle.



Push-Right to Recover



Pull-Right to Turn Right



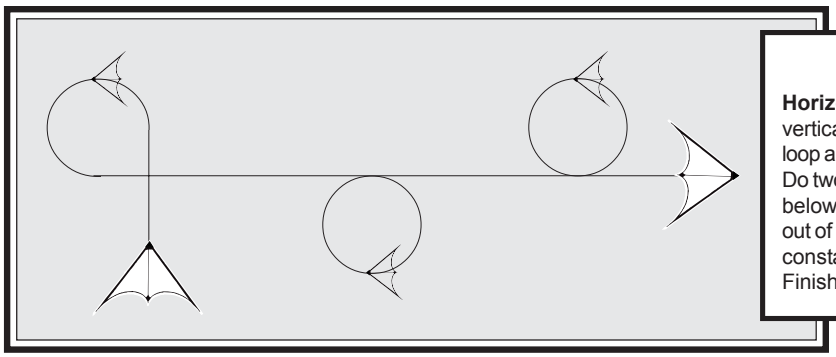
Pull- Left to Recover

Pull-Pull: The pull-pull results in the same, round type of turn as the pull-push. The difference is that you recover by bringing your opposite hand back, even with the turning hand, to finish the maneuver and return to straight flight.

Pull with your right, then pull with your left.

Pulling powers you into the turn. Pulling again powers you out of it. This makes the pull-pull useful for quick curves where you may need that extra power - like hairpins near the ground. You can then return to the normal flying position by bringing both hands in front of you simultaneously.

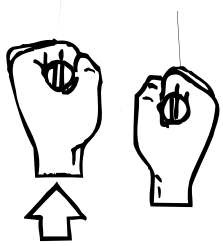
Remember, when both hands come together, the kite should be flying straight - in whatever direction it happens to be pointed.



Practice Assignment

Horizontal Pass with Loops: Start in a short vertical climb on the left edge. Complete a tight loop and fly out into a horizontal pass to the right. Do two more loops- one above the line and one below - using a pull-pull turn to power in and out of the circles. Concentrate on maintaining a constant speed through the entire maneuver. Finish on the right side of the window.

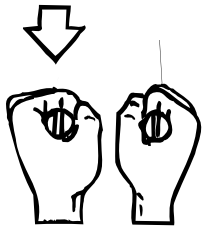
Push-Pull: Now let's try something new. If you want to turn to the right, try pushing on the left. Recover by pulling the same hand back in. This may seem a bit unnatural at first, but the results are dramatic corners.



PUSH-LEFT TO TURN RIGHT

Remember that pushing decreases power on one side of the sail. Pulling to recover increases your thrust as you come out of the maneuver.

What all this means is that you better start practicing “push turns” if you want to make really sharp corners. This is one of the most useful techniques you can develop. The quickest, sharpest, and most angular turns are created by pushing on one line.

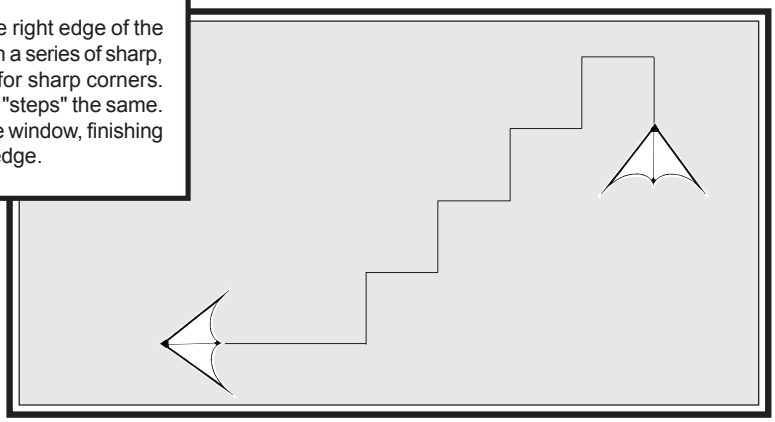


PULL-LEFT TO RECOVER

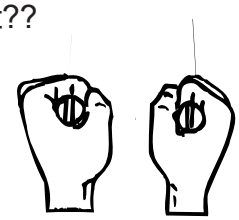
Think of a “push" turn more like a “punch” turn. Jab your fist out there and pull it back in just as fast. The kite will snap quickly in the opposite direction.

Practice Assignment

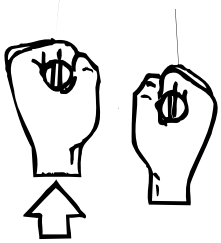
Steps Down: Start in a climb from the right edge of the window. As you approach the top, begin a series of sharp, ninety-degree turns. Use push-turns for sharp corners. Concentrate on keeping the size of all "steps" the same. Spread the maneuver across the entire window, finishing in a horizontal pass at the bottom left edge.



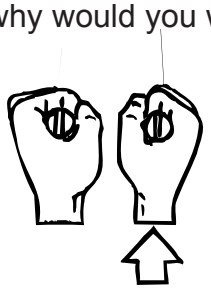
Push-Push: So if the push-pull powers you out of a turn, what does a push-push do? It reduces thrust going in, and reduces it even more coming out. Now, why would you want to do that??



HOLD EVEN TO FLY STRAIGHT



PUSH-LEFT TO TURN RIGHT



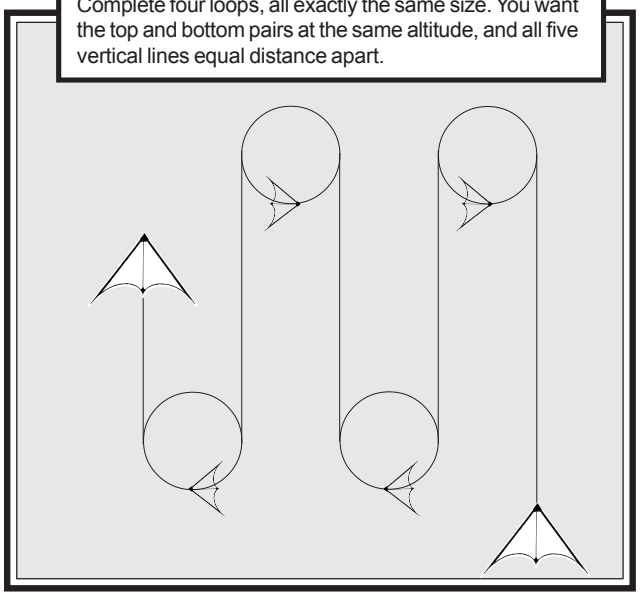
PUSH-RIGHT TO RECOVER

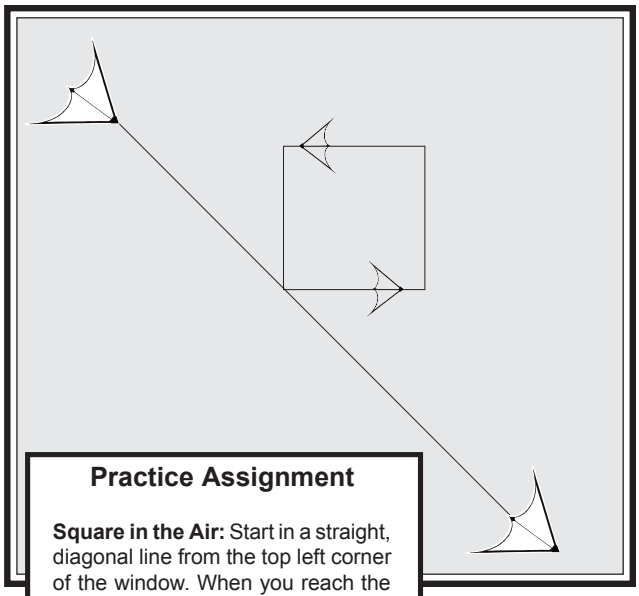
Well, sometimes, you want to slow down your turns. In smaller, tighter maneuvers, the corners may come so quickly that your hands and brain can't keep up. "Dumping" wind out of the sail makes the turns manageable and minimizes oversteering.

Try it. Slower can be better.

Practice Assignment

Lines and Loops: Climb straight up to the top of the window. Fly a tight loop and exit straight down toward the ground. Use pull-pull turns for the loops, and concentrate on maintaining a steady pace whether climbing or diving. Complete four loops, all exactly the same size. You want the top and bottom pairs at the same altitude, and all five vertical lines equal distance apart.





Practice Assignment

Square in the Air: Start in a straight, diagonal line from the top left corner of the window. When you reach the center of the wind, push turn into a square. Make all four sides equal and all corners perfect right-angles. Then continue the diagonal line to the bottom right corner of the window. Make sure your speed is constant through the entire maneuver.

Technique #4: Speed Control

Now that you have learned how to maneuver, you need to learn to control how fast - or slow - you fly, too.

Controlling speed has a lot to do with the grace and beauty of your flight performance. As your kite moves across the flying area, its speed will naturally increase and decrease depending on your altitude and distance from the center of the wind. But precision maneuvers that change pace - that speed up and slow down as they progress - look sloppy and unplanned. And if you're flying to music, you will want to adjust your speed to match the tempo, beat, or mood of your selection, not the force of the wind.

This all means that speed is very important.

You can make limited changes to kite speed by moving your arms. Swinging your arms forward will slow the kite, and pulling them back will speed it up. But there is a limit to how far you can swing your arms. So for real and sustained speed control, use your feet.

Move forward to go slower. Essentially, you are subtracting your own movement from the force of the wind. When you backup, it's the same as increasing the force of the wind.

Save your hand movements for smaller adjustments and quick stops or bursts.

Remember that the strength of the wind changes as you move closer, or farther away from the ground. Friction with the surface causes the wind to slow. In some cases, this change can be as much as five miles per hour, which means that in light wind conditions, the windspeed at low altitudes will be negligible. Lower wind speed translates into slower kite speed.

The effect of the wind on your kite also changes as you approach the edge of the flying window. The kite's angle to the wind changes which results in less pull and slower speed.

What all of this means, is that if you want to fly at a constant speed through the entire vertical and horizontal range of the wind window, you need to do something besides just stand still.

> *Speed control is more than simply a matter of moving forward and backwards. Try moving laterally - or opposite to the direction of your flight. If the kite is moving to the right, side-step to the left. Moving from side to side will not only affect pace in a horizontal pass, it will also increase the distance that you can fly out to the edge of the wind. Later in Chapter 8, we'll even talk about how to force a ground pass completely upwind by moving in the opposite direction.*
>
> *There is a limit to how far you can push and pull with your hands. By using your feet, you change speed in straight lines, or add and subtract power in your turns. The point is to make physical movement part of your performance technique.*

In Chapter 6, we'll talk about tools that can be used to reduce speed in higher winds. These are methods and devices for reducing overall speed. They will slow everything your kite does by one or two miles per hour. When we talk about speed control, what we mean is relative speed - going faster and slower whenever you want.

Remember that steering and speed are two different things. Steering means changing the tension between your two lines, while speed control results from changing the tension on both lines together.

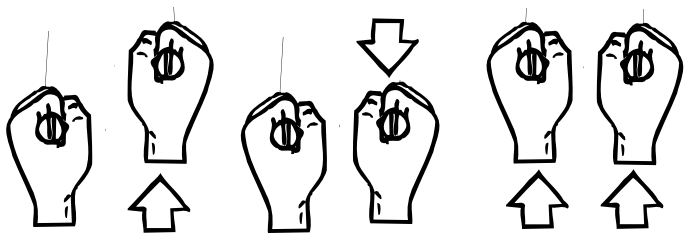
Technique #5: Mid-Air Stalls

Remember the push-push turn? Here is another reason you would want to push on both lines. Draining the wind out of your sails opens up a whole range of tricks and stalling maneuvers. The mid-air stall, or "snap stall" is just the beginning.

Start in a horizontal pass and plan to complete a quick, sharp push-turn up. With both hands close to your body, punch one hand forward, and then just as quickly, pull that hand back in. The kite will jerk, nose up. Now just as your hand is coming back in and the nose of the kite starts to turn, push both hands forward, hard.

These three movements - "punch-pull-double push" - need to be done together quickly.

Practice your timing so you can get the maneuver as quick and crisp as possible. The kite will stop dead in the air.

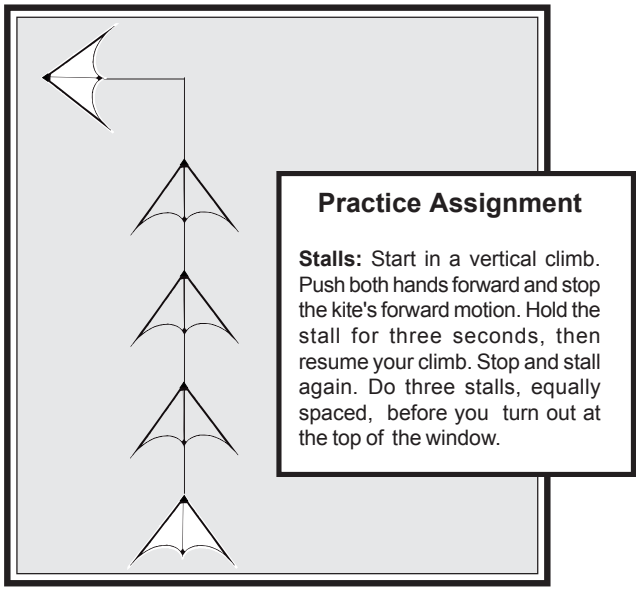


PUSH TO TURN VERTICAL | **PULL BACK TO STRAIGHTEN** | **PUSH-PUSH TO STALL**

In a lighter breeze, the stall should hold. But if the kite is giving you problems, try one of these “stalling” techniques.

Move your feet. If the kite starts to rise, move forward. If it starts to sink, move back. Remember what you learned about speed control.

If one wing starts to rise, push gently on that line. Pushing will reduce just enough lift to lower the kite back into position.

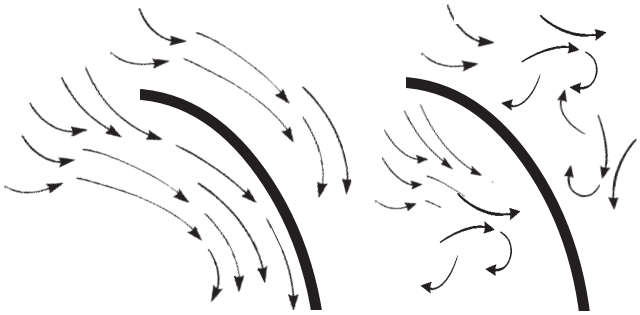


Practice Assignment

Stalls: Start in a vertical climb. Push both hands forward and stop the kite's forward motion. Hold the stall for three seconds, then resume your climb. Stop and stall again. Do three stalls, equally spaced, before you turn out at the top of the window.

The object of these snap maneuvers is to create turbulence in the air around the kite and in particular, behind it. Smooth air, going over and under the wing, creates lift.

Turbulence interrupts that lift and causes the kite to hang, unstable in the sky. So your goal is to keep air around the kite “disturbed” enough that it doesn't develop enough lift to fly. Then all you need to do is balance it.



SMOOTH AIR CREATES LIFT TURBULENT AIR STALLS

A mid-air stall, directly downwind, is a pleasing addition to any routine. And even if no one is watching, it’s still a very satisfying trick to perform. Practice holding the stall as long as you can. And then practice popping out by either pulling on both lines to continue the vertical climb, or pulling on one side to turn back into the horizontal pass.

Pulling allows a clean, fast recovery from a stall. Remember, push into a stall, pull out of one.

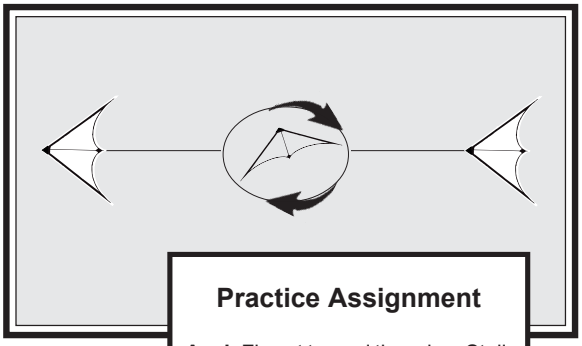
Stalls will hold more easily if you move the tow point on your bridle slightly toward the base of the kite. Tune as if you were preparing for slightly heavier wind.

Technique #6: Axels

So how would you describe a flat-spin Axel to someone who has never seen one? Easy. You just stop the kite in midair, lay it forward on its face, and then spin it around. Well, at least it sounds easy.

Let’s take a look at each of these three elements and see if we can dissect the Axel into something you can easily do.

Stop: You have already learned how to do a stall. Push and Hold. The same stall is a preparatory step for the axel. Just be ready to hold that stall a little longer - and make sure the base of the kite stays parallel to the ground.



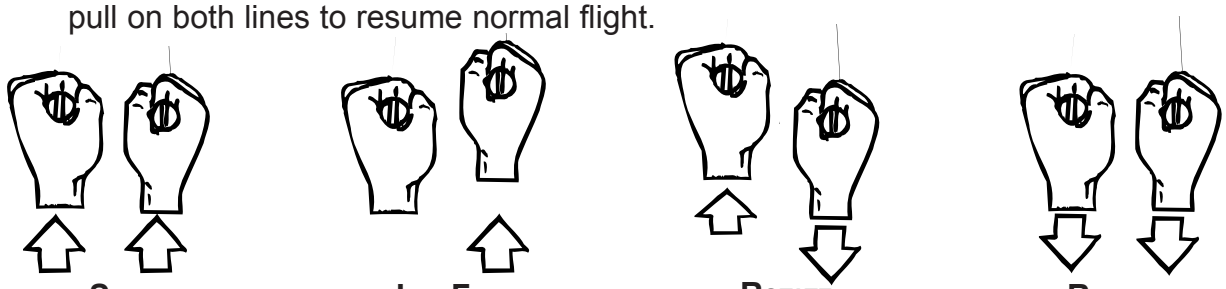
Practice Assignment

Axel: Fly out toward the edge. Stall. Fly an axel. Then recover.

Lay Flat: Next you want to position the stalled kite flat in the sky -- face down -- so the base and nose are almost level. To do this, ease back on one line about six inches. It doesn't matter which line. The point is to ease, not push the line so the kite falls forward into position.

Rotate: This is the tricky part. You want to pull on one line to spin the kite. Make it a short, sharp pull - like a tug or a "pop". This will get one wing moving. At the same time, you need to give the other wing a little slack line so it can follow on around. Remember, pop with one hand and push slack with the other.

Resume: The kite should flat-spin around and then swing nose-up. All you need is to pull on both lines to resume normal flight.



STOP
PUSH AND HOLD

LAY FLAT
EASE ONE LINE FORWARD

ROTATE
POP RIGHT, SLACK LEFT

RESUME
PULL ON BOTH LINES

You are going to have to do all of this lightening fast. Practice the combination of maneuvers in your head before trying them with a kite. Actually move your hands. Push to stall; ease to lay flat; pop and slack to rotate. When you can do it without straining your brain, then try it in the air.

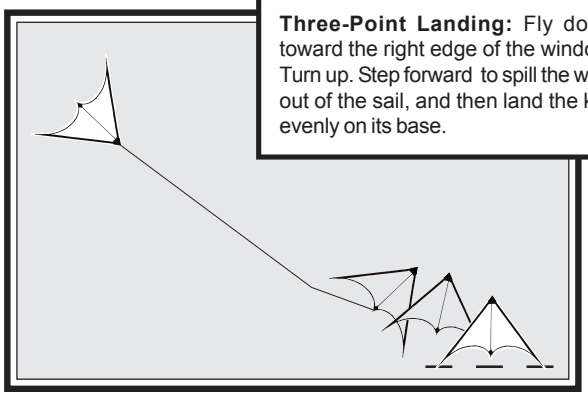
Axels will take practice at first - and just the right touch. But after you get the first, each one you do afterwards will get easier.

Technique #7: Three-Point Landings

Now that you know everything about the basics of advanced flying, you need to spend a little time on an advanced landing. Our goal is to set the kite down gently on its base so it is in position and ready to relaunch.

Approach the extreme left or right edge in a low, horizontal pass. You want to reach your landing zone at an altitude of three feet or less. As you move further and further to the outside, the power of the wind will decrease and the kite will slow. You know you can slow it even more by moving forward.

When you reach the point where you want to land, turn the nose of the kite up, as if you were going to stall. As the kite pivots, push and step forward. The kite should settle backwards into a perfect “Three Point” landing. Keep some tension on the line, and you can relaunch whenever you are ready.



Practice Assignment

Three-Point Landing: Fly down toward the right edge of the window. Turn up. Step forward to spill the wind out of the sail, and then land the kite evenly on its base.

Whenever you land your kite, remember that flylines strung out across the flying field can be a hazard to anyone else in the area. This is particularly true if they are anchored just a few inches off the ground. Be considerate of the people around you, and don’t expect them to be familiar with your equipment or your “flying protocol”.

Practice the three “C’s” of safe kiting: Caution, Courtesy, and Common Sense

Now you are ready for just about anything. You can use your skills to develop fancy routines. You can choreograph your routines to music and fly kite ballet. You can compete or perform demonstrations for your friends. And most important of all, you can fly a little bit better which means you will be safer and have more fun.

Learn each of these techniques and incorporate them into your flying. Practice the assignments we have outlined in this chapter. Later, we will come back and talk about those assignments again.

The skills you have developed will allow some amazing maneuvers. And that's what we are going to talk about next.