

The Art of Kiting a Hang Glider [contributed by JOHN MATYLONEK]

Kiting a hang glider is a fundamental skill every pilot should master. After instructing hang gliding for over 22 years, I have learned a thing or two about how to make life easier as my students and I repeatedly make our way up and down the hill during training. The last thing I want to see is a student walking like a martyr up a dune or hill in the wind.

The art of kiting a hang glider is an underappreciated skill that teaches much about how a glider works in the wind and gives one a sense of mastery and accomplishment. Plus, being able to effectively manipulate, orient, and carry your hang glider on the ground is the difference between a session filled with anxiety, wasted effort, and frustration and

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a day of calm, fulfillment, and feelings of control.

Being able to walk up a hill or dune with a hang glider with the least amount of effort is the goal, and using the wind to your advantage is the tactic. Don't try to overpower the wind, but instead use it to make life easier.

There are seven rules of kiting or carrying a hang glider:

1. Change tactics from solo kiting to assisted wind buddy carrying, according to the amount of wind present.
2. Yaw the glider towards the uplifted wing.
3. In high winds, handle the front wires for small and medium-size wing-leveling corrections.
4. For higher wing up corrections, step in the direction of the uplifted wing.
5. Handle one front wire and one side wire for larger corrections due to terrain effects.
6. Constantly juggle between side wires and front wires in response to wind direction shifts and terrain effects.
7. If the glider keel dips below shoulder height, buddy carrying the glider is more effective.

Unless you plan on running your hang glider like a toy kite in a windless playground, there must be enough wind to carry the glider's weight, so the keel at least rises to shoulder height. Any less than that, and you must revert to solo carrying the glider in the control frame or buddy carrying it using an assistant on the very end of the keel. If there is enough wind for the glider to remain lifted, so the keel becomes almost horizontal, then you can practice the dance between the wires that keeps the wings level as you walk up the hill or dune.

Once you are in the airflow, the glider should easily fly, keel almost horizontal, by just letting up the nose on the front wires. Most people think that's all there is to it. But, no, there are definite skills that need to be honed to be an effective flyer de cerf-volant, or "kite flyer."

The Foundations

The first skill is hand positioning on the front wires. The higher you place your hands, the more control you have at the expense of lift. The lower you place your hands on the front wires, the more lift you have at the expense of control. Essentially, that is almost entirely the whole operating theory of learning how to hang glide. Given the wind speed and turbulence, there will be an optimum location on the front wires. Of course, that continually changes.

Once you have the glider flying smoothly without much oscillation, you are ready to practice. The proper way to hold your arms is with locked elbows as if they were pieces of lumber, mostly stiff. Imagine you have a rigid bar handcuffed between your wrists, forcing your arms to stay parallel. Your hands must simultaneously move left and right across your face. [Photo 1] There is NO push in or out motion. All the action is in your arms and the muscle power from the shoulders. When you move your hands simultaneously left and right to yaw the glider across your face, your body must be an anchor, an "at-rest body" around which the glider pivots. You are mostly using your shoulder muscles for this motion.

Eventually some irregularity in the wind



PHOTO 1 A useful technique for kiting hang gliders is to imagine there are rigid handcuffs attached to your wrists requiring simultaneous movement of both your left and right hands to yaw the glider slightly. The limiting arm is the one on the side where the wing is being lifted. If you let go of that side, you can get even more yaw and leveling. Here, advanced instructor John Matylonek demonstrates the basic kiting position on the beach at Pacific City, Oregon.

flow, probably a slight change in direction, will cause one wing to go high. Catching this early is essential in order to avoid having to resort to more drastic techniques. The moment one wing goes even a little raised, throw both outstretched arms, wrists, and hands in that direction to level the wing. Like a sparrow that is never quite motionless, you dither—constantly making small adjustments both left and right—in response to left and right wingtip rising. Remember, practice makes perfect. Paraglider pilots stand for hours kiting—hang glider pilots should do at least half as much in training if the conditions allow it.

Eventually, some wind effects may cause the wing to rise higher than can be corrected with simple lateral thrusts. In that case, along with your thrust, take a step in that direction to change the anchor position. This often is quite effective—even too effective. You'll sometimes overdo it. The other wing rises, and you must immediately throw your hands in the other direction or even step back as a correction to your correction. Be careful of pilot-induced oscillation! This is a flying dan-

ger later in the program when you start doing fast takeoffs or landings, but here, you can experience it on the ground. Essentially, you become out of phase with the glider, and your correction is too late and reinforces the initial disruption you were trying to correct. In that case, forcing the glider onto the ground on its wheels is the best thing to do, so you can start again from a level position. With practice, you can easily modulate your corrections while the glider is kiting and eventually get it to level.

Terrain Effects

As you walk up uneven hills, dunes, and fields, the wind deflects, carrying the shape of the terrain and causing all sorts of lifts and sinks. These terrain effects cause much larger forces on wings and require two hand changes. If the right wing goes up (kiting perspective), the left hand goes where the right hand was, and the right hand goes to the right-wing side wire at about midway, palm down. You can predict where this will happen because you can see the shape of the hill ahead of you.

Try to be yet another "triangle" in the overall

PHOTO 2 Hand placement on the side wire with body triangulation when the terrain lifts one wing. You are pushing down on the wire to keep the wings level.



triangular design of the hang glider. Now, you are not using yawing physics; you are actually depressing the wire down with force to keep that wing level. [Photo 2] The dance outside the wing now becomes hands trading wires left and right to keep the left and right wings level as the wind changes direction and gets deflected off the terrain. As you negotiate the dune or hill, avoid the wings slipping into wind-shadow “holes” or pockets of sink. This takes practice because it must be done spontaneously without thinking. You are getting the “real feel” of how the hang glider interacts with the wind. Eventually, you will be able to predict its actions before any visual expression.

The Buddy Carry

Sometimes, the wind will decrease, and you'll need more lift to kite the glider. In this case, lower your hands on the front wires slightly. However, this comes at the expense of control, just like if you were flying. The oscillation may not be worth it if you have to lower your hands too much for it to kite. At this point, the keel has potentially gotten lower as well.

When this happens, ask your buddy to saddle the very end of the keel with their open hand, palm up. The carry buddy's role is to relieve some of the weight of the glider so you can carry the glider from the base tube using

your outstretched hands, locked elbows rigid, and your hands low at the upper thigh area. Never let your hands go higher than your upper thigh. Keep your arms straight, elbows locked and low.

Three entities are now carrying the glider—you, your buddy, and the wind. Your buddy carrier is essentially a robot, walking a bit more slowly than you, with no active job to do; they simply walk consistently and slowly in the direction you want to go. The buddy carrier mustn't anticipate or “help” your corrections in any way, except to lower or raise the keel at your request and to allow the keel to rise from their hand or shoulder if you want them to. [Photo 3] The buddy carrier should NEVER hold down the keel of the glider. In flight mode, a glider's keel is simply not designed to be held down.

So now your goal is to keep the wings level as before by yawing toward the high wing. But this time you must step/jog/run left and right around the buddy robot carrying pivot point (reminder, catching perturbations early prevents drastic actions). This is very active maneuvering, like our dithering sparrow again. [Photo 4] However, it is still much easier than solo carrying the glider in the control frame. Sometimes you can add weight and lean in through your locked elbow to assist the step to the uplifted wing. It sounds like



PHOTO 3 This is the proper way to hold the keel in a buddy carry; alternatively, you can use your shoulder to go hands-free.

PHOTO 4 (BELOW) The student pilot, Silas Eastman, in charge of keeping wings level walks, jogs, and runs toward the up-lifted wing. Notice Silas's attentive gaze on the wingtips while the carry buddy saddles the keel with an open palm (Photo 3), always ready to let the keel fly off the hand. This is very crucial to a successful buddy-carry.

work, but you have three lesson buddies to share the joy of learning—you, your robot, and the wind.

Emergency Techniques

Despite our best intentions, one wingtip may hit the ground and jam into soft sand, dirt, or tall grass. If that wingtip does not extract itself (assume it will not), there is the danger of the wind pole vaulting the glider over that wingtip, snapping the leading edge, and ripping right through the sail. If one tip ever touches the ground, your reaction should be to step away or even fall away (on your butt) from that wingtip in the opposite direction. This extracts the wingtip (and you) from a pit of despair and chagrin.

When one wing goes high and the simple two-hands lateral move is not enough, you can let go of the wire on the side toward the direction you are yawing (the uplifted wing) so that your other arm can continue to turn the nose in that direction. This move eliminates the need for a step in that direction. Now, you really look like an expert with one hand leveling the glider and leaning over in that direction while the glider remains stable.

Stick to the Basics

Kiting can give you a sense of control and mastery before hooking in. Hang gliding

should not be an all or nothing activity, and kiting is a perfect introductory experience that illustrates many concepts in higher level flying. It emotionally prepares you to lift your feet off the ground, which is the point of the first lesson. 🇺🇸

You can view these techniques at the following links:

Buddy carry: <https://youtu.be/t6PzPzAhvu0>

Kiting a hang glider: <https://youtu.be/AQwfoj5cCCM>

