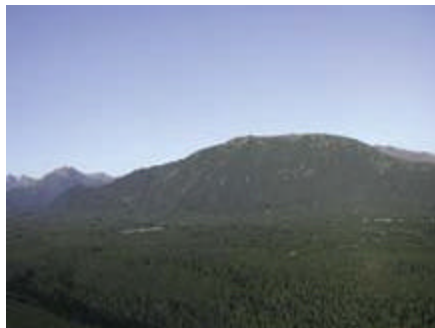


Crosswind Operations in a Powered Parachute



Bear Mountain, rising 3400 feet is a foothill in the Chugiak Mountain range and only a few minutes flight from Birchwood Airport.



The Eklutna Tide flats along Knik Arm, where many of the ultralight flyers of Alaska learned to fly.

My purpose in writing this is to expand the possibilities for flight and instruction in a Powered Parachute.

I live in Anchorage, Alaska. Recently, I reached AFI status with Aero Sports Connection (ASC), and am rated in both Powered Parachutes and Flexwing Trikes. In Powered Parachutes, I have 663 hours and I have 189 hours in Flexwing Trikes.

In a Powered Parachute I hold two US National and World Records for Altitude (17671 feet) and Time to Climb to 3000 meters (22 minutes and 30 seconds) both set in 2000. In 2001, I attempted to set a US National (Point to Point) Record when I flew my Six Chuter SR-2 778.6 miles across Alaska from Prudhoe Bay to Birchwood Airport in 27 hours 44 minutes and 27 seconds. (A programming error in a flight recorder prevented this flight from becoming an official record.)

I have given hundreds of introductory flight lessons, have trained 27 Powered Parachute Pilots, and have recommended eight BFIs over the last five years here in Alaska. In this time, I have flown in a wide variety of wind and weather conditions. I have found the Powered Parachute to be an incredibly tough, durable and forgiving aircraft! It is my hope that I may be able to help promote the safe operations of Powered Parachutes by promoting crosswind training in Powered Parachutes.

Most of my flights are from Birchwood Airport in Chugiak, Alaska. At Birchwood we have two choices for takeoffs and landings, Runways 01 or 19 (North/South Runways). Unfortunately, the prevailing wind at Birchwood is east to west!

Beginning with my first flights, I pushed the envelope flying in light crosswinds, and learned to ground handle my chute in these conditions. It quickly became apparent why crosswind takeoffs are not recommended. I haven't rolled my cart, but I came close early in the learning curve. Since then I have developed skills for crosswind flying, originally based on what I have read about Para-glider training.

Paraglider pilots learn to ground handle their canopies before they are allowed to fly. Though the control over our chute is limited by comparison, it has proven correct that we can have considerable control of our parachutes in the ground environment. Currently, I require all of my students to demonstrate crosswind proficiency before I release them to fly on their own. I inform students that historically Powered Parachutes have not been considered crosswind capable, but after some demonstration and explanation, I find that most pick up the concepts very quickly. As of this writing, no one trained by me has rolled their Powered Parachute.

This is the third draft of this article in as many years. It wasn't until I met Jon Thornburgh that I was convinced the time has come to make this information public. I have been reluctant because of the overwhelming amount of published material teaching that Powered Parachutes are not crosswind capable. I intend no disrespect to any of the masters of our sport. The Powered Parachutes of today are more capable than ever before, with expanded flight envelopes that some earlier machines simply were not designed for. Crosswind operations of Powered Parachutes will be a necessary part of flying in the coming era of Sport Pilot, which will allow Powered Parachutes to fly from virtually any airport in the country.

Learning to fly a Powered Parachute in a crosswind starts with a simple premise – when on the ground we are performing two separate functions. First, we are driving our kart wherever we are going (i.e. taxiing on /off the runway, or the take-off roll), and second, inflating our Parachutes.

Since the later is done behind our backs, I install a nine inch convex mirror in front of the pilot to allow him/her to monitor the chute both during inflation / transition and while taxiing. (You still must turn your head to check your lines before take off!) The advantage of the mirror is to reduce the need to look up and/or behind to keep track of the chute. (Keep your eyes looking forward as much as possible.)

When attempting to take off in a crosswind, the chute will (if uncorrected) lie over on the downwind side. This can be corrected with a coordinated use of throttle, air steering tubes, and ground steering. The throttle (power) is one key in controlling the wing/chute on the ground, because the lifting power of the wing is dependent on its air/wind speed. If the air/wind speed on the wing is controlled, we can reduce unwanted lift (i.e. lift in any direction except straight up).

Response of the air steering tubes during inflation is slow, but it will eventually respond to every inch of steering tube applied. This allows directional control of the chute. After the chute is inflated, you can keep the chute in its desired position by smooth and gentle air steering tube application. This is done the same way you hold a heading in flight across the wind line. The inputs are very similar, except that on the ground, you are flying the chute while driving the kart. By keeping our ground speed below flying speed we can control both separately.

As long as the airflow over the chute is sufficient to keep the chute inflated and insufficient to lift the machine, we can steer it independently of the kart. Remembering that our chutes have a slight delay between input and action, we must practice being ahead of the chute with our inputs.

This takes a little practice, but is not actually that difficult. I start training students by having them set down in slight angles of crosswind and taxi below flying speed. The ground speed must be enough to keep the chute inflated, but not enough to lift the kart. This is the easiest method I have found to teach handling the chute in a crosswind.

With slight angles of crosswind the inputs are relatively small and the student can quickly see the effect he/she has on the chute. On windless days, the same effect can be accomplished by having the student taxi in an S pattern on the ground. Taxiing around corners is accomplished using the same techniques. As I approach the turn point, I turn the chute first (what I call pre-biasing the chute) so the chute has already started to turn before I begin to turn the kart. Coming through the turn with the kart, I relax the air steering tube as the ground turn is completed. Normally, I can keep the chute within a few degrees of center throughout the turn.

Ground speed must be controlled to keep the chute fully inflated and flying without lifting the kart. If the ground speed becomes too low, the chute will become loose and start to oscillate. Each chute is a little different.

The rectangular chutes I have experience with will fly overhead at the slowest speeds, whereas, the elliptical wing requires a slightly higher ground speed to remain stable. I have yet to fly a full elliptical wing, and am not ready to comment on their ground handling characteristics. Turbulent or thermally air may require additional input from the pilot. The secret is not to over control the chute. The chute will turn almost as quickly on the ground as in the air and thus requires a gentle touch.

Practicing ground handling is essential to learning to fly in a crosswind. If this practice is done carefully, it is safe and can be fun. Start in slight angles of crosswind and then practice keeping the chute overhead with increasing angles of crosswind.

Crosswind landings are the easiest crosswind maneuver to perform. As the Powered Parachute turns to final, ground track is maintained with air steering. The kart will be turned (crabbed) at an angle to the runway relative to the wind speed, but it is quickly straightened using ground steering at touchdown. Once on the ground, continue to steer the chute to keep it in position as you taxi to your shut-down point. I always taxi off the active runway either into a turnaround or back to the hangar.

Practice is essential, as skills and confidence do increase with time. I have launched my Powered Parachute in a 15 mph 90 degree crosswind, and consider crosswinds of five to ten mph as normal flying weather. The proficiency and comfort of each pilot must dictate what amount of crosswind he is ready to fly in, but I believe that all Powered Parachute pilots should be trained to handle some amount of crosswind. I hope that eventually crosswind training will become a standard part of learning to fly a PPC.