How to fly a powered parachute

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Chapter 1

Choosing the right machine

As an experienced powered parachute (PPC) pilot with no mishaps, I will tell you how to enjoy the world's safest and easiest form of flight.

There is a lot of information out there. Some books are full of fluff and have way more information than you will ever remember, need or use. My book cuts through the fluff and tells you what you really need to know.

If you have not already, I suggest that you take an introduction flight with an experienced instructor, so that you make sure you love it first!

My disclaimer is that this book is in no way intended to be a substitute for personal instruction by a qualified instructor. However, with this information you will be way ahead of most other people and if your PPC of choice is in the ultralight class, no training is legally required.

Types

In this book I will be discussing PPCs which have tricycle wheeled landing gear and rigid seats, sometimes confused with a Powered paraglider (PPG) where your legs are the landing gear and you hang in a harness.

There are many different designs available: single place, two place, factory built, homebuilt, large engines, small engines, roll cage, no cage, low attach points, high attach points. The parachutes vary as well. There are rectangle chutes and elliptical.

First determine the kind of flying you want to do, will it be solo most of the time or with a passenger?

I can highly recommend the Airframes Unlimited designs by Don Stutts out of Texas. Back when he used to supply plans, I built my own modified version of the T-2. I called it the T-2.3.

Here is a photo to get you even more excited.

He still sells many different PPC models in ready-to-fly-form at a fantastically realistic price. Here is his contact information: Airframes Unlimited 903-203-3639

A solo machine allows you to avoid any Federal Aviation Administration (FAA) regulations for training as long as the empty weight is under two hundred fifty-four pounds and caries no more than five gallons of fuel. Also they are less money than a 2-place, burn less fuel and are more compact.

Two-place machines require some official training and a sign-off for solo flight to build up some time and experience. Then with some additional training and testing, you can legally take passengers.

The factory-built machines are pretty nice, although they can be expensive depending on the options and engine choice. They are typically "bolt-together" for one reason: ease of shipping.

Homebuilt machines can be a lot nicer. I know that my custom built machine is a superior all steel welded unit. I custom made it just the way I like it. The airframe maintenance required is nearly zero, the pre-flight is a snap, and it's tough as nails and stable as a rock.

Large engines such as a Rotax 912 eighty or one-hundred horse power are overkill on a PPC. They are too expensive and so heavy that the extra horse- power does not improve climb over a properly designed airframe with a smaller 2-stroke on board which has the right reduction ratio and prop combination.

Roll cages are a nice safety feature. I have never rolled one, but I would not want four hundred pounds of fully fueled aircraft landing on top of me. Also, it is nice to have something out front if you run into a fence. I have not done that either.

A lot of factory PPCs have low attach points and this can make for a rocky ride in turbulence. High attach points over the head do a lot of good by reducing the rocking and providing a smoother flight.

Some beginners start with the elliptical wings, although they require greater skill and attention than a rectangle chute. Chiron is an excellent elliptical wing and usually flies at about thirty-five MPH. Thunder bolt wings can fly around forty to forty-five MPH.

For the safest and easiest flight, the rectangle is the way to go; they generally fly at around twenty-eight MPH. I can recommend Performance Design as an excellent choice.

Elliptical wings will give you greater maneuverability, climb, speed and lower engine cruise RPM due to the reduced drag compared to a rectangle wing.

Chapter 2

Training and weather

A great way to get a head start is to read the Ultralight Pilot Practical test standards, available from the experimental aircraft association (EAA).

Find a good instructor through word of mouth, if possible. They are also listed on the internet and in ads as well. Hopefully you can find someone you get along with and who is safety-minded, knowledgeable, consistent and attentive.

People have also taught themselves to fly ultralight PPCs and it would not be too tough either. Compared to any other form of flight, a PPC is the easiest to learn. I am not recommending you do it, but it has been done successfully.

PPCs like low wind conditions and calm air, which you can generally find early in the morning. My favorite time is right at sunrise; it makes for a beautiful and glass smooth ride. I have flown in winds up to fifteen miles per hour, but it was not as much fun bouncing around so much. Even in no wind conditions during the day, thermal activity can make for an uncomfortable ride.

You can get weather reports from official sources, the evening news and the local controlled airport Automated Terminal Information System (ATIS). I find the most

accurate way for me is to just go outside and look at the sky and feel the wind. I have lived in the area long enough to tell if it's going to be a great PPC flying day.

With a strobe light you can legally fly a PPC one half hour before sunrise and one half hour after sunset.

If you happen to fly through a little rain, it's no big deal; the chute may get heavier and be a little sluggish but it's not going to fall out of the sky.

I have flown through light rain and kept going into clear skies, the chute dries out quickly in flight. If it is still wet after landing or the grass is wet, it's best to let it dry as much as possible before stuffing it back in the bag. You can leave the bag unzipped and it will air out.

Before you start flying it's important to familiarize yourself with any nearby airspace restrictions. Flying into controlled airspace without authorization can be dangerous and/or get you into trouble.

PPCs have an excellent safety record and we want to keep it that way.

Chapter 3

Preflight

A preflight is something to be taken extremely seriously without distractions such as people standing around asking questions. If there are curious bystanders, just inform them that you need some space and you are happy to answer questions after the preflight.

Factory units will typically come with a checklist for that type. With a homebuilt, you can come up with your own. Basically you want to look at and touch every part of the machine, sometimes things can look good, but prove loose or damaged when touched.

I do a preflight and post flight, so I don't get to the field and find something that needs repair, which can put a damper on the fun.

I do an aircraft inspection in the shop after flying or after I fuel up for the next morning's flight. I do another quick one when I get to the field, which consists of

looking at my riser attach points to the machine and chute and I check the engine attach points and the prop for nicks and proper safeties.

The airfield

A large square grass field is best for a PPC; paved runways work also, but you need brakes to get stopped after landing. In addition, it may not be possible to takeoff and land directly into the wind.

I live out in the country and have several grass fields available. You want a good four hundred feet of unobstructed, fairly smooth grass without any power wires or trees nearby. Initially, you will probably use most of the four hundred feet at takeoff when you are learning.

You want to use all of the available runway, so start all the way at the down wind portion of the airfield.

I have a collapsible windsock that I put up first thing so I can point the PPC into any wind before I get started with the preflight.

Engine start

Always be certain the throttle is only slightly above idle position before any engine start.

The standard procedure is to clear the area around the prop and yell "clear" before starting the engine, weather or not anyone else is around.

The engine needs to be warmed up. This should be done according to the manufacturer's instructions. I run a 2-stroke Hirth 3203 and warm up at three thousand RPM for seven minutes. This gets the cylinder heads up to operating temperature for this air-cooled unit.

Rotax 2-strokes should be warmed up for five to seven minutes as well. This is especially important for Rotax water-cooled engines as an inadequate warm up can lead to engine seizure at takeoff.

If you have a dual ignition system, do a quick ignition check according to the engine manufacturers instructions. A slight drop in RPM is normal and should be pretty even on both sides. This is a good indication of proper ignition operation.

If your machine has brakes, great, if not you can lean against the PPC during warm up to prevent it from rolling. Always stay with it when it's running, with a hand near the throttle.

Chute lay out

After the warm up it's time to shut down the engine and lay out the chute. My preferred method is to lay it out on its back, centered behind the machine. If it's off center it will come up to the side and may cause tipping if you are not quick on the controls.

Be sure that all the chute lines are on top of the chute, especially the ones at the tips.

Now take out most of the line slack by rolling the machine forward if necessary. Move the steering lines out to the sides; this helps untangle things. Now, check the carabiner and attach points between the risers and chute lines for security and condition.

Hold the carabiners with one hand and with the other, grasp each line separately and shake it out to disengage it from the others. As you do this be alert to the condition of the lines and chute, any frayed lines or tears in the chute are grounds for a factory repair.

Finally, make certain that the lines are away from the rear wheels. If you run over one side during the ground roll, the chute will yank you over to that side and probably cause a roll over.

Some machines have hooks on the sides of the fan shroud for the risers. My machine does not and I place the lines on the ground, out of the path of the wheels.

Get ready for flight

Re-start the engine and strap yourself in or vice versa if you can reach the recoil start from the pilot's seat or you have an electric starter.

I have a simple three point pre-takeoff check on my instrument panel and it reads:

1. Seat belts on
2. Fuel check
3. Chute and lines check

I make sure my safety belts are secured. I then turn around to visually check the clear standpipe fuel level indicator and to be sure all the lines are still out of the way of the wheels and that the chute is still in takeoff position.

You can add some things like: radio on and set, instruments check, etc. The engine will have cooled down some from the warm up, but if it's only been five or ten minutes, you should be okay.

Chapter 4

Flying

Now that you are strapped in and ready to go, place your feet lightly on the inboard portion of the rudder bars so the chute can relax into neutral position during inflation.

Place one hand on the throttle and the other on the ground steering bar and be sure the front wheel is in a neutral position, straight ahead.

Takeoff

You want to throttle up quickly to about two thirds power so the chute comes up crisply. Turn to one side right away to watch that it's coming up straight. This only takes a few seconds. If in doubt, immediately throttle back and kill the engine.

It's much better to be safe than sorry and you can re-lay out the chute and try again.

Sometimes if you are wimpy on the throttle you can experience a "lock out" where the chute starts to come up and gets stuck at about a forty-five degree angle. If this happens, shut down, re-lay the chute and try again with more throttle.

When the chute is overhead , you may need to throttle back slightly to avoid a premature takeoff. Look at the lines left and right to insure nothing is tangled and that the chute is fully inflated and overhead.

While you are doing all this, you must also keep the cart centered under the wing, mostly with ground steering and you can also steer the wing back overhead with the rudder bars.

This may sound intense, but it's actually really easy with a little practice and you will only be moving at fifteen or twenty miles per hour at this point.

Usually if you have laid the chute out directly behind the cart and you are taking off directly into the wind, no steering is required.

A word of caution

Some inexperienced pilots want to try to increase the designed turn rate of the chute. Never, under any circumstances while in flight, push maximum rudder bar with a leg and then reach up to a brake line and pull even more by hand.

Some folks have done this and collapsed a side of the chute with fatal results. Most good chutes will re-inflate when the brake line is released, but you don't want to take that chance.

Be alert

A great rule of thumb is to fly only over areas where you would not mind landing. Keep enough air between you and the earth to provide gliding distance to a safe landing zone in the event of an engine out. Rectangle chutes glide at about a four to one ratio, ellipticals at about six to one.

Flight over water can be hazardous as a forced landing may get you caught in the lines. If you are going into deep water, kill the engine if it has not already completely quit and bail out about ten or fifteen feet before splash down.

Keep your head on a swivel and watch for other air traffic and obstacles. If you have an aircraft radio on board you can tune to the local "pilot's frequency" which is 122.75 anywhere in the U.S. This is a real nice addition and can add safety because you can hear and communicate with other air vehicles.

About the only ways you can hurt yourself in a PPC are:

1. A poor pre-flight check leading to mechanical failure.
2. Improper chute lay out and or inflation.
3. A decision to fly in bad weather.
4. Flying into something or, someone flying into you.

Most PPCs are built way stronger than they need to be. My machine, risers and chute are rated to ten thousand pounds. Even with a big passenger and ten gallons of fuel, it only weights eight hundred pounds.

Flight

If it looks good, go to full power and you will be flying! This is a piece of cake, the only flight controls you have are left and right with the rudder bars and throttle for up and down.

Take it up a few hundred feet over an open area and start to get the feel of it. Like any other aircraft, a turn increases drag and requires some additional throttle to maintain altitude.

Before landing

When setting up for landing, remember to grasp the ground steering bar again and center the front wheel.

Do some idling descents from a safe altitude over the airfield to familiarize yourself with the glide ratio.

Then do some power on touch and goes, always into the wind. This can be done with or without a flare, you can use throttle control too, to "grease it in" if you have enough runway.

Landing

You should set up your landing at about one half throttle, for my machine this is about thirty-five hundred RPM. After a short time, you will get the feel for it without checking the tachometer.

Again, be sure the ground steering is straight ahead. If you land directly into the wind, no steering is usually required during landing.

Once you are coming down on a glide path at your intended landing point, leave the throttle were it is. A few feet before touchdown, push both rudder bars to full deflection for the flare and a nice smooth landing.

Immediately release the rudder bars, go to engine idle, kill the engine and reach up high and grab the brake lines with both hands and pull down, crossing your arms for maximum travel and braking effect. This will cause the chute to slow down and fall behind you. That way you will stop rolling quickly and the chute and lines will not get wrapped in the prop.

High performance wings

Elliptical wings are more aerodynamic and take more skill with a modified approach. When this type of chute comes up overhead, you may need to apply brakes through the rudder bars. This keeps it from over running the cart and causing a huge embarrassing mess.

During flight, you will find elliptical wings much more maneuverable than a rectangle chute. Chirons are so maneuverable in fact, that vertical spins and complete barrel rolls are possible. Only highly experienced pilots should ever even consider attempting these maneuvers.

Also, brakes can be applied for additional lift, like applying flaps. Let off slowly though or you will experience a quick initial drop in altitude. In rough air some brake can be applied to reduce the effects of turbulence as well.

During the landing roll, you should hold whatever brake was applied for flaring, again to slow the chute so it does not overrun the cart.

Other than that, it is basically like flying the rectangle chutes, just much more sensitive.

Stowing it

It's a good idea when you are done for the day, to pack up the chute as soon as possible. If you leave it unattended, a wind gust can pick up the chute and cause problems.

Also, the ultraviolet light from the sun usually causes more wear to the chute fabric than anything else.

After landing, re-lay the chute like you did for takeoff, place the lines on top and zip on the line socks. Fold the corners in repeatedly one at a time to the center until you have about a three-foot wide pile of chute.

Now you can do the "PPC pilot roll"; you lie on the chute at the cart side and roll over and over to just before the inflation cells to expel the air from the chute.

Fold the chute over on itself towards the cart to a convenient size to fit in your chute bag. I always keep the printing on the chute bag aft so I can consistently repeat these procedures without tangling lines. Stuff it in the stowage bag and secure it to the cart.

Thanks for reading!