Introduction to Paramotors

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The Powered Paraglider (PPG)

- aka “Paramotor”
- *Ultralight Vehicle* regulated by 14 CFR Part 103.
- With about a week of proper training, paramotors are easy to fly, transport, and maintain.
- Beginner pilots can take off and land within a football field-sized area
- A disassembled PPG setup is small enough to fit in a compact car or small airplane.

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The Powered Paraglider (PPG)

- Average cruise speed of **25-35 mph**.
- Can fly for about **2-3 hours** with 5 gallons of fuel, although most flights are no longer than an hour.
- Most flights take place below **500’-1,500’ AGL** in Class E or G airspace, with a service ceiling of about 9,000’-10,000’.

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Powered Paragliding

- Growing popularity due to affordability, low barrier to entry, and “high fun density”
- No prior aviation experience, certification, or medical requirements.
- $12-15k “zero-to-hero”

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How Safe is It?

- *When treated with respect*, paramotoring can be one of the safest and most liberating forms of personal flight that exists.

- Many of the the risk factors associated with flying paramotors are within the pilot's control—it's **largely as safe as the decisions we make and the level of risk we choose to accept**.

- Entering the sport through proper training on safe equipment is critically important to mitigating risk throughout your flying career.

(This photo doesn't capture the smell of the mint and lavender fields below)

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Regulations

- *Minimally regulated* by Part 103
- Applies to **single-placed**, **non-certificated** ultralight vehicles that may be **unpowered** or **powered** by design.
- Must fall within standards of **weight**, **fuel capacity**, and **speed**.
- Limited to **recreational** or **sport purposes** only.

A student fulfilling his legal obligation to have fun.

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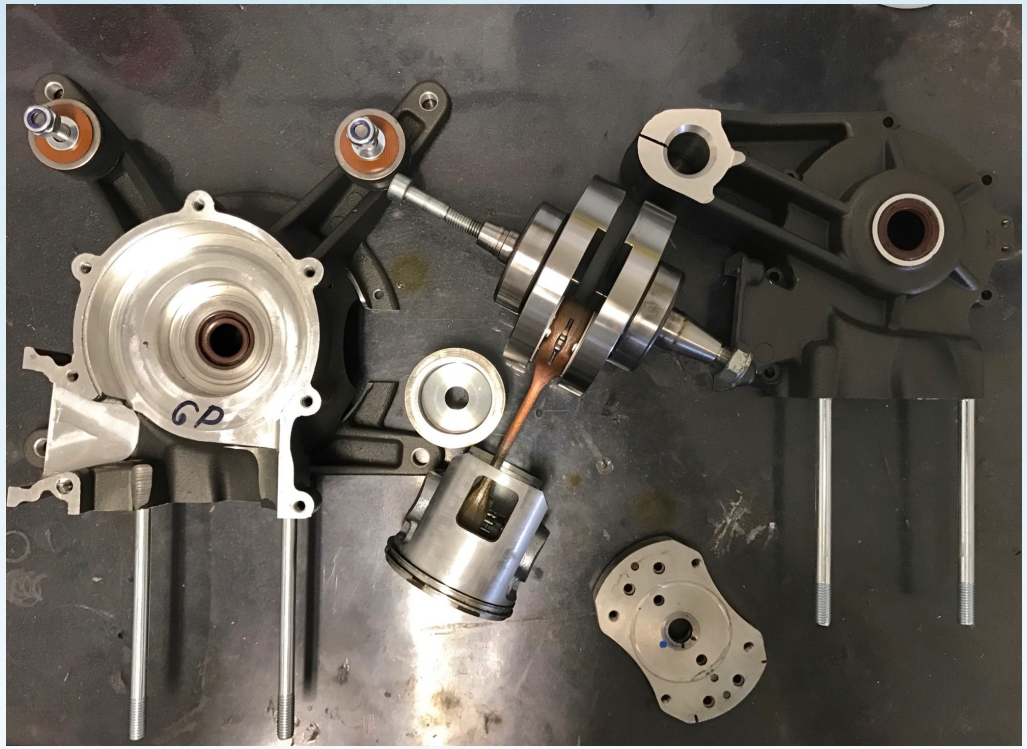
Certification



- Part 103 doesn't require any **certification** of ultralights, **equipment**, **components**, or **operators.**
- No **knowledge**, **age**, or **experience, or medical** requirements.
- No standards of **airworthiness**, registration, **maintenance**, or **inspection** requirements.

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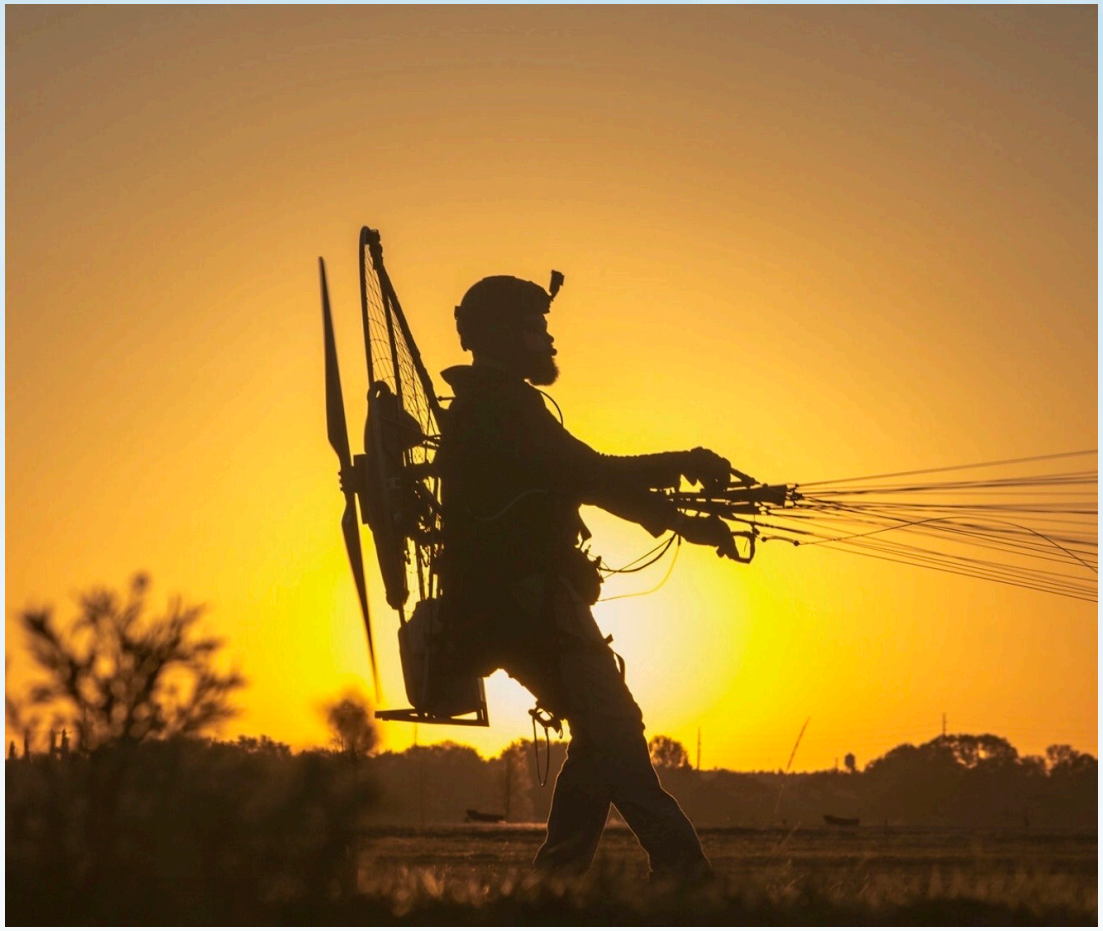
Why it Matters

- *These limited requirements are what make our sport so available to so many people but are also what define the basis of our operating limitations*

- As an UL operator, **you alone are responsible for your personal safety and development**.



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“The Ten Cannots”

1. Create a “***hazard***” to people or property
2. Carry **passengers***
3. Fly over “***congested areas***” or **people**
4. Fly at **night**
5. Fly in the **clouds**
6. Fly without **visual reference** to the **surface**
7. Fly within an area designated by a **TFR**
8. Create a **hazard to aircraft**
9. Receive **compensation** to fly
10. **Deviate** from any rule within Part 103

Courtesy, Austin Joffe

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Our Roots

PagoJet BG11 (circa 1988)

- Rudimentary machines with modified parachutes: heavy, cumbersome, inefficient, and difficult to use, not widespread or practical for the common person.
- Slow growth through the 90's and mid-2000's.
- Modern equipment and training techniques have made significant generational improvements within the past decade alone.
- The rise of social media further accelerated the public awareness and growth of our sport.

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The Modern Paramotor

Parajet Maverick with Vittorazi Moster 185

- Modern paramotors are typically powered by a two-stroke motor between 80-185 cc.
- Harness is attached to a titanium or aluminum chassis.
- Normally weigh ~45 lbs empty, and ~65 lbs when loaded with fuel, floatation devices, and a reserve parachute.
- Disassembles/assembles in about 15 minutes.

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The Paraglider

- **This is where the magic happens!**
- aka “glider” or “wing”
- Elliptical with no rigid structure.
- The glider is inflated with ram air through an opening in the leading edge, which builds internal pressure and gives the airfoil its aerodynamic shape which produces lift.

Bruce Goldsmith Design “Magic”

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The Modern Paraglider

- Based on their size and design, gliders can be best suited for a variety of different **purposes**, **skill levels**, **weights**, or **flying conditions**.
- Significantly more efficient than parachutes, with a glide ratio of about 9:1.
- More **dynamic** and **maneuverable** than parachutes.
- Technological advances over the past decade have made gliders lighter, more efficient, and **easier to use**.

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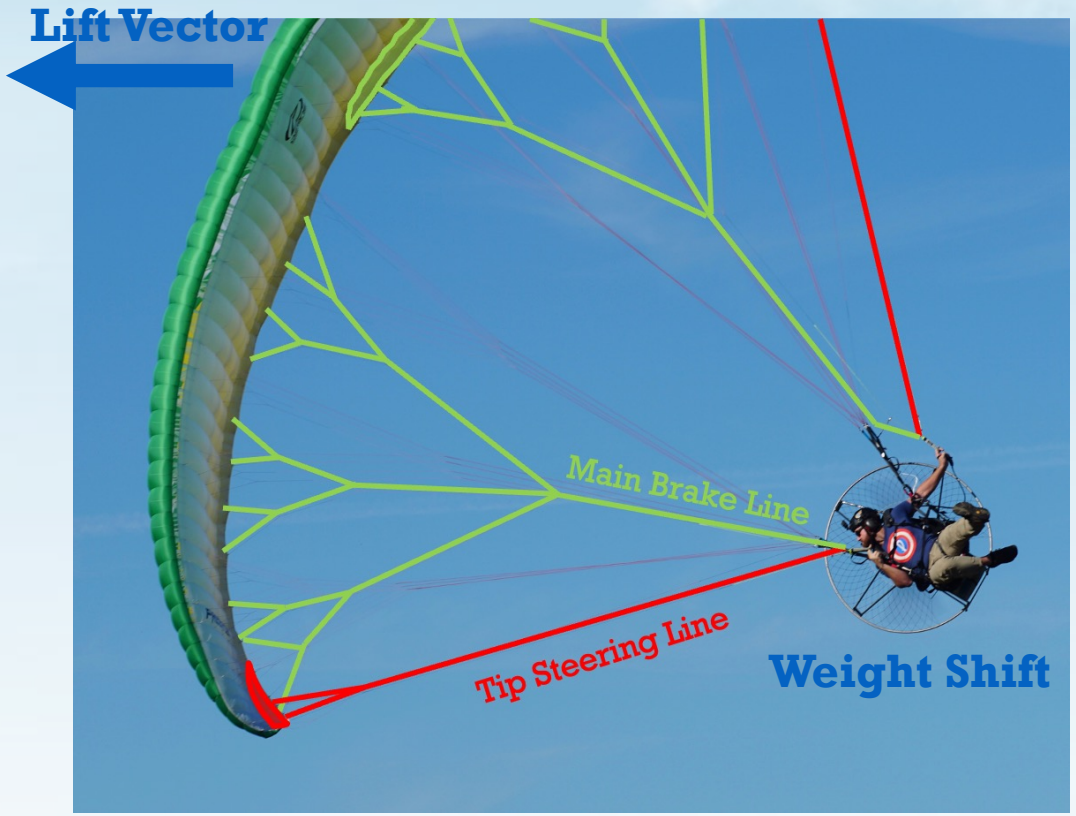
Basic Flight Controls

- There are four forces and three rotational axes acting on the powered paraglider in flight.
- Engine RPM is adjusted by a handheld throttle.
- The glider is steered and controlled using a combination of brake toggles and weight shift.



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Weather for Beginners

- Safe paramotor operations are very dependent on weather
- Non-thermic flight windows
  - Within ~2 hrs after sunrise and 2 hrs before sunset.
- Stable atmosphere
  - High pressure, no frontal activity, no precip.
- Calm/light winds less than 10 mph with low gust factor
- Must adhere to VFR cloud clearances

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Seek Quality Training

- Although this sport can be exceedingly safe, it can become dangerous if given the opportunity
- The trial-and-error process of self-training is *not* an efficient or reliable way to safely gain the precise skills, coordination, and specific knowledge our sport requires
- The costs of overestimating your ability to teach yourself *or learning through poor instruction* can be significantly more expensive/frustrating/painful/debilitating in the long run
- **<u>You are a product of your experience and you should view quality training as an investment in your future</u>**
- Not all schools or instructors are created equally, so do your research

EXPERIMENTER

ULTRALIGHT WORLD

THE VALUE OF GOOD TRAINING

Don't be too proud to learn

BY JON EISELE

"Mistakes are inevitable in aviation, especially when one is still learning new things. The trick is to not make the mistake that will kill you."

—Stephen Coonts, *The Cannibal Queen: A Flight Into the Heart of America*

THE SPORT OF POWERED PARAGLIDING, also known as PPG or "paramotoring," is enjoying a golden age of unprecedented exposure, increasing popularity, and rapid growth in the United States.

Many topics inevitably thrive in various debates whenever paramotor pilots come together. However, every paramotor pilot has to start their journey somewhere, and the question of whether to seek professional training or embark upon "self-training" is arguably the most discussed, divisive, relevant, and important topic at the moment. This subject is fiercely defended by strong opinions and strong emotions from both sides of the aisle within the community. I, too, hold a strong opinion on this topic.

This EAA SportAviation article is available at www.paramerica.us/resources

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Building Blocks

- Most reputable training programs use a building-block approach to training which includes:
  - Ground Handling Exercises (aka “kiting”)
  - Flight Simulations
  - Posture and Throttle Manipulation Exercises (aka “Lean Backs”)
  - Towing Exercises and/or Tandem Flights
  - Approx. 20-30 flights
  - Ground School

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Kiting

- Before students run into the sky, they must first master the basics of handling the glider on the ground.
- Although kiting can initially be challenging and sometimes frustrating, through practice, it can quickly become rewarding, enjoyable, and therapeutic!
- Many students learn to enjoy kiting just as much as flying!

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Motor Sim

- The motor sim allows the student to rehearse their first flight from start to finish, while listening to instructional commands, and practicing precise throttle control.

- This exercise also gives the instructor the ability to instill the correct techniques, practice lost communications procedures, and correct student mistakes from the safety of terra firma.

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Leanback Exercises

- Maintaining the correct posture while leaning back against the trust and manipulating the throttle is important to a safe and efficient launch.
- After students acclimate themselves the throttle on the motor sim, they learn to “trust the thrust” and leanback while walking forward.

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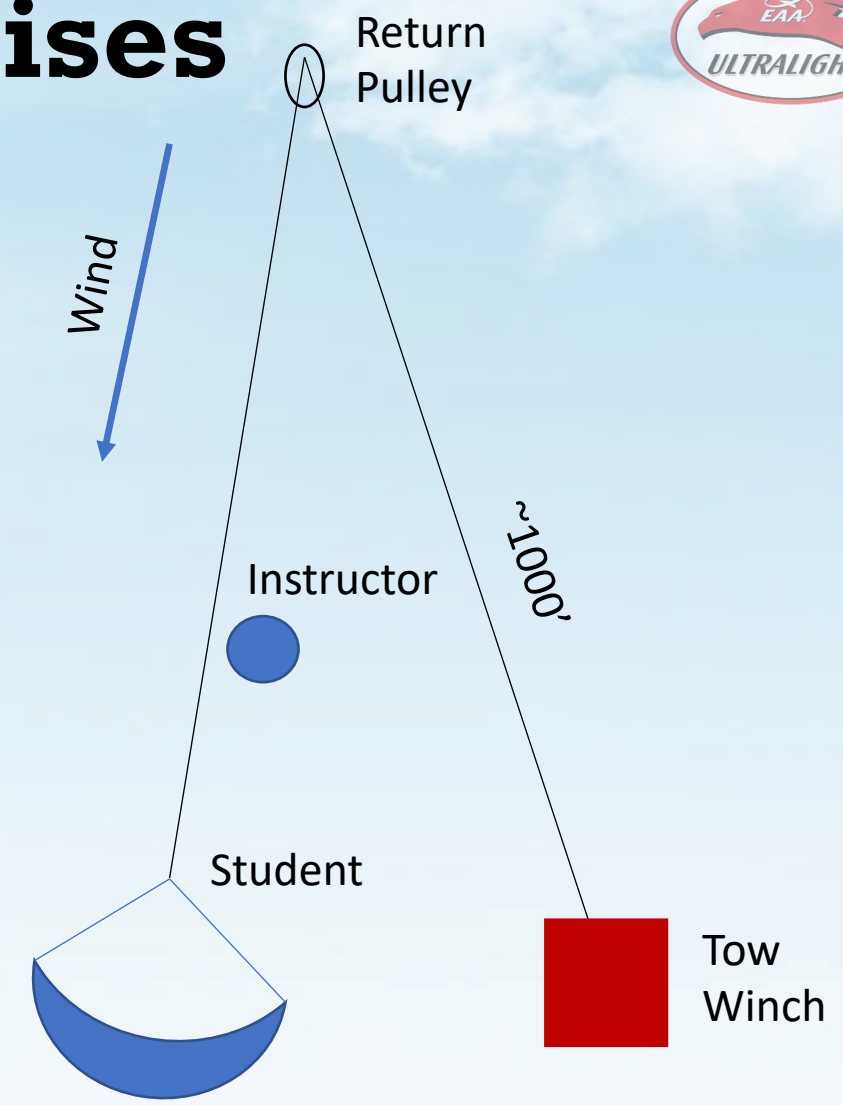
Towing Exercises

- After students master control the glider and have rehearsed the correct launch technique, they move onto winch tow flights.
- While only reaching an altitude of about 40-50’, towing exercises enable students to practice the takeoff process and perfect their landing technique without the added weight and complication of a paramotor on their back.



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Tandem Flights

- FAA exemption only
- USPPA and ASC exemptions
- Training purposes only
- Subject to conditions and limitations
- While not all paramotor schools use tandems, they do provide a fun opportunity for students to experience flight for the first time and build confidence with an instructor.

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First Flights!

- After the student has satisfied pre-solo requirements and has practiced and rehearsed each step of the process, they're ready to run into the sky for the first time!
- Following successive solo flights and debrief periods, instructors normally provide less guidance and instructional commands over the radio until students are taking off, maneuvering, and landing independently.

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Knowledge is Power

- Beyond simply learning how to fly, you should seek a school or instructor that includes a comprehensive **ground school curriculum** as part of their training.

- Topics should include: Regulations, Airport Usage, Airspace, Principles of Flight and Flight Procedures, Equipment Selection, Maintenance, Weather, Aeronautical Decision-Making, Risk Mitigation, and discussions covering a variety of emergency/abnormal scenarios.

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Finding the Right Instructor

- Not all schools or instructors are created equally, so do your research.
- Ask about their training philosophy, syllabus, and experience.
- Ask about what's included in the training.
- Ask about their schedule (FT vs PT)
- While not legally required, certification helps to provide a standard demonstrate an instructor's commitment to their specialty.

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Final Words of Advice

- Be cautious of instructors that advertise “free training” or require you to purchase equipment before beginning training.
- Be open to the idea of travelling for training
- Talk to multiple instructors, current pilots, and former students before deciding.
- Find an instructor that you jive with!

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Questions?