



ACT (Adaptive Camber Transmission)

Parakite risers

User Manual

Introduction: The 4-Liner Parakite Advantage

The parakite revolution unlocked incredible pitch authority, but as pilots push these wings to their absolute limits, the structural compromises of standard 3-liner architectures become apparent. Building a 4-liner system provides the opportunity to improve on the limitations of 3-liner architectures while creating a new, responsive feel for parakites, ensuring the absolute profile integrity required to manage the extreme dynamic loads of freestyle flying.

The Apco ACT (Adaptive Camber Transmission) introduces a true 4-liner parakite architecture, fundamentally upgrading the wing's structural support and aerodynamic range. Rather than compromising on line consumption, we added the fourth row to give the canopy exactly the support it needs, exactly where it needs it.

The Structural Superiority of the 4-Liner

- **Uncompromising High-Speed Support:** In a reflex profile at full speed, the



aerodynamic center of pressure shifts drastically forward. Our 4-liner design places the B-lines in the optimal position over the chord to support this massive load. This dedicated support prevents the nose and mid-chord from deforming, locking the profile in place for rock-solid stability at top speed.

- **Slower Stall Speeds:** At the bottom end of the speed range, the 4-liner architecture shines. When a deep brake pull is applied, the cascading support structure across the B, C, and D tiers allows the wing to generate a highly efficient, high-lift camber without collapsing the chord. This produces significantly more lift, resulting in a noticeably slower stall speed and a highly forgiving, powerful flare.

SECTION 1: Technical Architecture & The 1:2 Cascade

The ACT system utilizes a proprietary 4-liner dynamic reduction cascade:

- **D-tier:** 1:2
- **C-tier:** 1:4
- **B-tier:** 1:8

Why the 1:2 Ratio?

- **Direct Feel of the Glider:** With this precise mechanical reduction, the pilot experiences a direct, raw connection to the aerodynamic load and pressure changes of the wing.
- **Bigger Speed Range Available:** The configuration maximizes efficiency within a standard arm stroke, unlocking a wider usable speed range directly through trailing-edge input.
- **Linear System Movement:** Toggle input translates to a perfectly linear movement across the cascade, ensuring a smooth, predictable transformation of the canopy's profile without sudden spikes in pressure.



SECTION 2: The Trim-Lock System & Steering Mechanics

The **Trim-Lock** feature allows the pilot to mechanically secure the main toggles directly to the A-riser, fixing the primary cascade at the trim speed position. When the system is locked, the wing is controlled via the brake line.

The parakite toggle features an embedded snap lock. To engage the Trim-Lock, secure this snap lock to the metal ring at the base of the riser, **ensuring it is completely locked around the ring.**



1. Operational Envelope (When to Use)

- **Safety Margin:** The Trim-Lock must only be engaged when the pilot has a sufficient safety margin and ample altitude.
- **Proximity Prohibition:** **NEVER** engage or fly with the Trim-Lock system activated when operating close to the ground, dunes, or obstacles. Absolute terrain clearance is mandatory to allow for manual intervention if needed.

2. Steering Mechanics Under Lock

When the Trim-Lock is engaged, the wing remains fully controllable through a dedicated line routing:

- **The Control Line:** Steering is executed via the brake line exiting the locked toggle and traveling upward toward the canopy. This line features a prominent **red triangle handle**, which the pilot uses for steering while the system is in trim lock.
- **The Split Cascade:** As this line travels upward, it splits into the **main brake line** and the **2D brake line**.
- **Handling Characteristics:** Pulling this line inputs a proportional, combined deflection across both the center trailing



edge and the wingtips, providing stable and intuitive steering while the primary handles remain securely fixed to the A-riser.

SECTION 3: Flying Smarter: Energy Management

Wings equipped with the ACT system are highly dynamic machines designed for intense, active flying sessions. Because a parakite requires far more continuous pilot input than a standard paraglider, relying on brute force will drain your stamina in minutes. The secret to a long, precise session is rhythmic energy management.

- **Treat Speed as a Battery:** Speed is kinetic energy. Instead of constantly riding the brakes to manage your altitude, let the wing fly fast to store energy. Use it smartly when you need to execute a maneuver, converting that raw speed into a massive, precise surge of vertical lift.
- **Capitalize on High Lift:** In traditional paragliding, you might pull brake to "park" and float in a lifting airmass. A smart parakite pilot plans ahead and will not automatically pull the brakes to catch the lift, only when needed. Allow the natural updraft to support your altitude while the wing accelerates, banking extra speed for your next maneuver.
- **Non-Binary Control (The Analog Spectrum):** Do not treat your speed range like an on/off switch. Your arm stroke is a continuous, analog dimmer switch. Use the entire spectrum (20%, 50%, 80%) to dial in the exact speed, glide, and tension the terrain demands.
- **Respect the Dive:** Because of the wing's massive pitch authority, releasing the toggles instantly will cause the canopy to dive forward significantly. This dive is a powerful tool to regain energy, but it must be managed with intention. You dictate the exact angle of the dive by how fast and progressively you release the brakes.

SECTION 4: Operational Limitations & General Safety

- **Aerobatics Strictly Prohibited:** This parakite system is a dedicated parakite engineered for high-speed carving, swooping, and proximity soaring. It is not designed for aerobatic flying.
- **Uncertified Freestyle Classification:** Wings equipped with the ACT system operate entirely outside of traditional passive-safety certifications (EN/DGAC). This system was intentionally designed to give the pilot unrestricted, unlocked pitch authority. There is no passive safety net; safety relies 100% on the pilot's active flying skills.
- **The Wind/Turbulence Trap:** The massive speed range allows pilots to fly in wind speeds that would ground standard paragliders. However, high wind creates severe

mechanical rotor behind obstacles, dunes, and cliffs. You must actively fly the wing at all times.

- **Symmetrical Inputs Near the Ground:** Because of the highly direct 1:2 mechanical advantage, deep, asymmetric brake inputs will cause the wing to dive and roll violently. When flying close to the terrain, always focus on symmetrical energy conversion and progressive, coordinated turns.

SECTION 5: The Pilot's Mindset: Discipline & Progression

- **Self-Control & Discipline:** Having unrestricted pitch authority means you must police your own limits. The wing will do exactly what you tell it to do, even if it means diving directly into the ground. True proficiency is rooted in discipline.
- **The Learning Curve is a Long Journey:** It takes dozens of hours of flight time to build the muscle memory required to master the non-binary speed range and to perfectly time your acceleration dives. Do not rush the process.
- **Margin for Error:** Start high. Give yourself hundreds of feet of altitude to experiment with the system, feel the surge, and understand the dive. Only after you have completely mastered the energy cycle up high should you begin slowly working your way down to proximity flying.

SECTION 6: The Parakite Pilot's Code (Ethics & Etiquette)

1. **The Speed Differential & Right of Way:** You will be flying significantly faster than standard free-flight wings. You are responsible for anticipating conflicts. Pass wide, pass predictably, and never aggressively carve near a slower pilot. Your wake turbulence alone can cause a serious incident for a standard wing.
2. **The Invisible Boundary (Uninvolved Bystanders):** A swooping parakite is practically silent until it is right on top of someone. Never use beachgoers, spectators, or uninvolved people as "pylons" for your foot drags. Keep a strict, absolute minimum buffer zone of 50 meters from anyone not actively participating in the sport.
Ridge Predictability & Blind Spots: The ACT system allows you to abruptly change altitude and direction in ways other pilots cannot anticipate. Always look before you carve, check your blind spots, and clearly telegraph your turns when flying in traffic.
3. **Paramotor Etiquette & Acoustic Footprint:** If you are flying the ACT system under power, be hyper-aware of your noise. Avoid aggressive, low-level freestyle flying over residential areas, crowded beaches, or noise-sensitive wildlife zones.
4. **Be an Ambassador:** Treat every session as if you are representing the entire sport. Be polite on launch, answer questions from curious locals, and enforce these ethics within your own local flying crew.

SECTION 7: Maintenance & Pre-Flight Inspection

The ACT system relies on a dynamic, mechanical reduction cascade. Inspecting your hardware and rigging is a non-negotiable part of your pre-flight routine.

1. The Trim-Lock Hardware & Split Lines

- **Locking Mechanism:** Before every flight, physically verify that the Trim-Lock attachment points on the A-riser are secure and completely free of damage.
- **Line Routing:** Inspect the control line exiting the main toggle. Ensure it passes cleanly into the split configuration (main brake line and 2D line) without twists, knots, or tangles around the risers.

2. The Dyneema Cascade Inspection

- **Friction Points:** Carefully inspect the Dyneema lines where they pass through the pulleys. Look for any excessive fraying or broken strands, which dictate an immediate line replacement.
- **The Anchor Loops:** Inspect the fixed connections on the risers and the anchor points on the pulley blocks, checking the bartacking and webbing for signs of stress.

3. Pulley Health

A jammed pulley destroys the smooth 4-liner progression and rapidly degrades the lines.

- **The Roll Test:** Manually spin every pulley in the cascade. They must roll freely and silently.
- **Clearing Debris:** If a pulley is contaminated with sand or salt, flush it thoroughly with fresh water and allow it to dry. Never use chemical lubricants or oils.

4. Post-Flight Care

- **Shake It Out:** Never pack the wing with sand or debris trapped in the risers or canopy cells.
- **Fresh Water Flush:** If exposed to salt spray or moisture, gently rinse the hardware and the lower line cascade with fresh water to prevent salt crystals from forming inside the Dyneema weave and pulley bearings.