

PARAMOTOR: CLOSER LOOK

APCO FORCE

APCO release a high performance full Reflex wing. Bob Drury tries it out



APCO Aviation from Israel are one of the most established in the world of paragliding manufacturing. They began manufacturing paragliders back in the early eighties having come from hang gliding design first. In recent years they've turned their attention to paramotoring bringing with them a wealth of innovative design concepts.

APCO's paramotor range includes the Thrust HP and Vista HP which are hybrid Reflex profile paramotor wings, but the Force is their first full Reflex wing aimed at challenging the higher performing PPG wings of the world.

THE PACKAGE

Unravelling the Force on the ground you know immediately that you have an APCO wing in your hands. APCO have long been advocates of using Gelvenor fabric, a highly durable silicon coated nylon. They were possibly the first wing manufacturer to use the fabric and have remained faithful to the South African cloth manufacturers for many years now, holding tight to their philosophy that their customers benefit from the extra durability and longevity of the cloth. One area they definitely do is with APCO's 3 year / 250 hour warranty.

With the wing open on the ground you soon start to see the technology that's been built into the Force. Firstly, like many modern paraglider wings, nylon wire supports the profile at the leading edge. APCO were one of the first people to recognise the potential benefits of incorporating plastic wire, which they call 'Flexon Battens', in the leading edge. The inclusion of the battens means APCO are able to omit the heavier Mylar fabric that traditionally fortifies the leading edge and stops it deforming. It also supports the profile more effectively. The result is less weight and better performance.

Next you'll notice that not only is the upper cascade of lines sewn directly into the under surface of the wing, the lines are also doubled up. APCO's MD Anatoly Cohn explained, "There is so much drag caused by the 200 or so line attachment points on the under surface that sewing the line directly into the sail saves a lot of drag. Add in the extra width of the line where it is doubled up in order to be stitched closed in a loop and in the long run a further saving is made by using thinner, unsheathed Dyneema line doubled up and sewn directly in." Some pilots worry that this leaves the lines exposed to greater wear and tear but Anatoly argues that "these lines almost always lie on the

sail when the wing is on the ground and in the air they aren't exposed to UV, so the wear and tear is minimal."

Like all modern high performance wings the Force has a complicated riser/acceleration system. Typical of APCO's philosophy to use the strongest fabrics they can, the risers are thick 25 mm back nylon webbing. Spilt As allow you to launch just the centre or the entire leading edge and make Big Earring easier. The two A risers aren't attached together by either magnets or Velcro which makes it feel like there is a fifth set of risers. It slightly overcomplicated life on launch and personally I'd have preferred them to stick together when I didn't need them to be apart, but it's a minor point and something one would soon adapt to.

Built into the Force's riser system is APCO's SRS, stall recovery system, an ingenious innovation that shifts the centre of pressure back forward should the glider ever deep stall.

The Force also has a wing tip steering system for controlling the wing at high speeds. Small comfortable handles stick with magnets to the B risers to keep the system out of the way when not in use.

There's 16 cm of certified acceleration on the speed bar, as the Force M has EN C certification.

What does that mean? It means that if you fly the Force M around and stay off the trimmers, security-wise, you should have a wing of EN C category, the paraglider 'sports' class of wing. The Force S is still going through certification. The Force has trimmers however and quite effective ones at that.

The trimmers give you 13 cm of acceleration, demarked on the easy-to-find bright red trimmers with bar tacked stitching every cm. The result is you can actually feel and hear the stitching as you release or pull in every cm of travel. However, like almost every PPG wing the wing has no official certification when you use the trimmers.

Recognising that trimmers have quite a lot of wear and tear on them just through normal use, APCO have elected to make the trimmer systems easily replaceable. If the tape starts to show signs of wear and tear you can just install a new pair of trimmers without changing the entire risers - a great plus point when you are investing in a wing you intend to keep for a long time.

The trimmers also offer you 5 cm of slow trim, which gives really accurate and agile handling for low level manoeuvring.

The other noticeable design feature is the HIT valves. Admittedly another UNA [unnecessary acronym], HIT valves are another great innovation from APCO. HIT, high-speed intake valves, are meshed cell openings above the normal openings on the leading edge. The idea is that as the wing is accelerated and the angle of attack reduced the HIT valves allow air to enter the wing section and increase the internal pressure of the wing. Do they work? It's hard to say, but the wing does have excellent internal pressure when accelerated. For more information on this technology go to APCO's website.

ON THE DECK

So on the ground the Force is literally bristling with technology, but what's it like at actually flying? One of the most important aspect of any PPG wing is the launch. APCO are adamant that they have the best launching Reflex wing on the market, and to be fair they've got a good claim on that title. Reverse launching in wind is really easy, the compact nature of the wing means there's little snaking around and the wing climbs smoothly overhead with the Reflex stopping it from over shooting.

Forward launching in nil or back wind situations it is again a mellow and controlled experience with the wing filling slowly and evenly as you run forward. If you're coming from a pure paraglider wing, you may find the Force fills itself to full pressure slightly slower than you are used to, however, that controlled and smooth climb is also the key to a perfect launch.



IN THE AIR

Once airborne though you really start to appreciate the Force. I was on a small size and it feels small. With a projected area of only 22.5 m², the small Force goes from 75-140 kg. I was flying at around 130 kg and the wing felt beautifully tauged and loaded. You get the feeling straight away that this is a performance wing. The trim speed is high, the wing precise and agile and rewarding to fly. Small inputs have a great effect and pulling big wingovers is simple.

Some people associate agility with being a handful in the air, and in some wings' cases that may be the so. The Force however just feels loaded and ready to throw about. It's got a solid and compact feeling about it that is almost certainly a result of its small area and high wing loading and with the trimmers set to slow you have a beautifully agile wing for low-level flying.

As mentioned before, the small Force flown high in the weight range has a high trim speed. Open it up further with the trimmers and you have a really fast machine. The trimmers have big, wide, easy to grab loops on them to make using them simple and I liked the way each set of stitching clicked through the buckles so I knew where I was in the speed.

Inevitably the handling gets stiffer and less responsive the more trim you let off, however the wingtip steering system is really well designed. The handles are comfortable and easy to reach and the braking action itself doesn't produce too much roll. Like with all modern PPG wings, using a combination of brake and tip steering produces a range of control that allows you to get the most out

of the wing in every situation. I'd be really excited to see how fast a top end competition pilot could get a Force around a slalom course. I never got the opportunity to fly a timed course, but it feels like it's speaking the right language.

Full trimmers/full speed bar is now the measure of a modern PPG wing. Whilst there's still no quantifiable way of judging a PPG wing's security at full trimmers/full bar, as it's almost impossible to collapse it, it is possible to get a feeling for its stability. At top speed the Force is fast and very stable. Once you've got the wing fully accelerated then you can just sit back and enjoy the ride as it cuts through the air as securely as all the other fully Reflexed wings.

LANDING

In nil wind this is a quick wing, so expect to come in fast and know what to do with that speed. Luckily the Force has a great reserve of energy for the flare and lands with little drama.

CONCLUSION

The APCO Force is certainly a new force to be reckoned with. It's not a beginner wing and it's not being pitched as one. APCO are calling it an intermediate wing, but I'd go so far as to say this is a brilliant performance wing for qualified and experienced pilots who want a fast, agile wing for XC, competition and fun precision flying. It's definitely got the speed and handling to challenge the best PPG wings in the world and I'd be surprised not to see it scoring highly in competition. **FM**



Line attachments sewn into under surface



HIT Valves



Tip steering control