

THE AEROS STEALTH KPL 13

The Avis* Of Hang Gliders

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This is a glider review with a difference. The glider sweating in the spotlight while we give it the third degree is the new welter-weight design from Aeros, the Stealth KPL 13. This glider is a new size and updated version of the glider we have reviewed before, so rather than repeat superlatives and caveats we will attempt to enter into new territory with this glider as our catalyst.

The first thing we'll cover is actually old territory, but the time is right for me to reiterate my review policy. Over the years that I have reviewed gliders I have not been in the hire of any manufacturer and have been a dealer for most. Hopefully this state of affairs has allowed me to be as unbiased as possible. I am a person who likes change, so I don't tend to become fixated on any particular design style or handling feel. Again, this trait helps me be more objective when I hook into and wring out a new glider.

The next point, as stated before, is that I only write reviews of gliders I like. You will not hear me totally denigrate a product in my reviews because I believe such an approach ultimately hurts the sport by causing dissension and possibly serious economic consequences for the manufacturer. (We all agree that we need more manufacturers, don't we?) But you *will* read certain little criticisms in my reviews as I have yet to fly what I consider to be the perfect glider. More importantly, you can read between the lines and assume that if you don't see a review of a glider then one of three things is in effect: 1) the glider is not readily available in the U.S.; or, 2) the manufacturer hasn't requested a review or doesn't realize the value to potential customers, which partially reflects on manufacturer reliability and response to user needs; or, 3) I felt the negatives of the glider outweighed the positives and sent it back.

To date I have flown all the topless gliders available except the European UP and Tecma offerings (a matter I hope to remedy this summer) so I have a good basis for comparison. On tap are the new Airwave Extreme and the Bautek Twister, both of which I have flown but not enough to review.

Getting back to the Stealth 13, it should be obvious that I

liked the glider after the foregoing statements and I wish to pass along my likes in the following paragraphs.

COST AND PERFORMANCE

Recently we have read some heartfelt letters bemoaning the fact that the cost of performance has pierced the tropopause, penetrated the stratosphere and is headed for the ionosphere. We sympathize with these views and worry that the sport will suffer a decline if the average work-a-day pilot can no longer afford to enter the aerial playground on equal terms with the affluent kids on the block. But in sneaks the Stealth to dispel these worries.

The Stealth KPL rivals any topless glider in performance. (Oleg Bonderchuk took second in the recent World Meet on a competition Stealth 14, having won a couple of days.) But relating to a recreational pilot's needs or desires more specifically is the fact that the Stealth costs no more than kingposted gliders of a few years ago.

In fact, after some thought as to what is meaningful to many recreational pilots, I have come up with a few performance parameters which are interesting. These are cost-to-performance comparisons, convenience-to-cost comparisons and convenience-to-performance comparisons.

Let's look at cost-to-performance. One useful performance measurement is a glider's maximum still-air glide ratio. We will make the educated guess that most topless gliders get a similar maximum glide and it is around 13 to 1. We can reduce this to a cost basis for the Stealth KPL by dividing 13 into the \$4,800 sticker price to arrive at a cost per point of glide of \$369.23. This figure is meaningless until we compare it to others. A topless glider costing \$6,000 yields a \$461.54 price per glide point, while a \$5,500 cost yields a \$423.08 price per point. For comparison, a fixed wing costing \$9,000 and getting a 15 to 1 glide yields a \$600 per glide point ratio. A paraglider getting 7 to 1 and costing \$3,500 yields \$500 per glide point. A single-surface hang glider costing \$2,500 and getting an 8 to 1 glide yields \$312.50 per glide point.

If all you were trying to do is maximize performance value for the money you would choose the single-surface glider. However, the Stealth KPL is not much above the cost-for-glide figure of the single-surface glider, and is clearly the winner when compared to other topless gliders in this category. No doubt price is a major factor in the Stealth's rapidly growing popularity in this country.

However, there are factors to consider other than pure performance for the dollar when selecting a glider. Let's see if we can quantify them.

CONVENIENCE COMPARISONS

Convenience to me is of lesser importance than performance, but it is still a factor in the equation when I decide to shell out

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wampum for a wing. I classify convenience as ease of setup, peripheral hassles and overall weight. We can compare these factors to cost and performance.

To compare convenience and cost, we multiply the convenience factors by the cost with the understanding that a lower number is most desirable. For the Stealth, setup takes me about 20 minutes. Multiplying by cost yields 96,000 convenience units. I could set up my old Klassic in 15 minutes or less and its retail cost was similar to the Stealth, so its convenience measurement was 67,500. Try this measurement with your own glider and see how it compares. A paraglider will win this category hands down, while a fixed wing loses big time.

I expect that the Stealth falls in the mid-range of topless gliders. It is easier to erect than some, harder than others. Here's a rundown on the main unique features:

- 1) Before you spread the wings you must put in the twin nose battens. If you forget, you will be gnashing your teeth and belittling your mental capacity, for these battens require gorilla force to position once the crossbar is opened.
- 2) After spreading the wings a bit, set up the front sprogs (inboard washout struts). To do this you reach in the zipper under the sail and set the cable tube on a post at the crossbar junction. By following this procedure you fix the cable up which holds up the sprog. Now put all the battens in except the outboard two.
- 3) Now you should place the hang point rocker arm on its cradle. Then attach the crossbar haulback and pull the VG tight. The tight VG allows you to easily put the sprogs inside the sail and close the lower-surface zipper.
- 4) Next comes the tip washout strut. This strut must be swung out to fit through a lower-surface batten hole, then it easily pushes into a hole in the leading edge. Close the lower-surface zipper at the strut, finish with the last three battens, put in the plastic tips and nose cone and you are finished.

Special notes: The basetube does not swing out, so you have to



put both ends on with PIP pins, an extra operation. The corner fitting could be easily modified, however, to allow the bar to swing out during packing. The lower-surface battens are very easily installed as you simply push them in. The only time you have to work them into the little slots provided is if you are truck tow-

ing (the bouncing can back them out).

The plastic tips are fairly easily installed with their velcro holding strips. They are conveniently stored with the glider and recognized as being the most aerotic tips in the business. Sometimes the velcro strips glued to them comes off, but this matter is easily remedied with more glue.

The peripheral hassles mentioned earlier are mainly the stowage of the cover and protection bags. The cover is great in my estimation, since it is big enough, has a rubberized coating and rolls up into a very small package. The all-important upright top protection pads stay with the glider, so you don't have to stuff them in your harness. A keel pad, control bar pad, keel end pad and tip bags all add to the package, but still your harness doesn't look like a glutton on Thanksgiving when the gear is stowed. The Stealth is pretty reasonable on this basis, but I'm still waiting for the glider whose fittings are so well designed all I need to carry is tip bags and the glider cover.

Next, we can make a weight-and-cost measurement by multiplying the two. In this measurement, it's only meaningful to compare gliders with similar areas. The Stealth KPL 13 (142 square feet) weighs about 72 pounds, so its weight-cost factor is $72 \times 4,800 = 345,600$. In this case the smaller the number the better. You can look up the cost and weight of other gliders in its class to compare.

The final comparison we can make is convenience-to-performance. The simplest way to do this is to divide the setup time or weight by the maximum glide ratio. For the Stealth 13 we get 1.54 for the setup factor (20 min./13) and 5.54 (72 lbs./13) for the weight factor. For both of these measurements the smaller the value of the factor, the better. As an example, for a fixed wing the setup factor may be 2 (30 min./15) while the weight factor may



Control bar corner hardware.

The Stealth tips



The spreader tower hang mechanism.

Stealth 13 planform.



be 6 (90/15). For a paraglider these numbers are around 1 and 5 or less. Compare these numbers with other gliders you are considering to help you make your decision.

PURE PERFORMANCE

I flew the Stealth 13 in the Atlantic Coast Championships at Wallaby Ranch. This was a tow meet and I was able to perform a quantity of quality performance comparisons. My wing loading was on the upper end of the glider's range, so I traded off some absolute sink rate for penetration. I can say that on the long glides between thermals I outglided most every other topless glider. Only Exxtacies seemed to beat me. One of the Stealth's higher speed glide secrets is its noticeable flattening of the battens when the VG is hauled in. This VG is fairly easy to pull incidentally,

TESTING GLIDER PERFORMANCE

Perhaps you have read of requests for real performance testing of hang gliders rather than simply reviewers' subjective reports. Such testing is desirable, but not practical without a budget larger than the USHGA and all the manufacturers combined could manage to contribute. The reason for this is that special instruments would have to be made and multiple tows to altitude in early morning hours would have to take place. The problems involved in gathering error-free data are numerous if absolute values of sink rate and airspeed are desired (a polar). If simple comparisons are to be made, the cost doubles, because two tugs, two gliders and two tow pilots are required. I expect that it would cost between \$5,000 and \$10,000 to perform an accurate evaluation of one glider. Then, if another glider is tested on another day, small-magnitude long waves or short waves in the atmosphere can skew the data. Thus it appears necessary to perform both absolute and comparison tests, another increment in cost.

I have never received a cent for testing and reporting on gliders (in fact, it usually costs me a bit). I would not accept money from a manufacturer if it were offered. I do it because it affords me the chance to experience the flying qualities of as many gliders as possible. I would, of course, love to be part of a team paid to objectively and scientifically measure performance, but I'm not holding my breath waiting for offers.

For those readers interested in learning more about testing performance, see Richard Johnson's articles in May 1989 ("Sailplane Performance Flight Test Methods") and October 1983 ("At Last: An Instrument That Reads Drag!") issues of *Soaring* magazine.

with two full pulls required for full throw.

My climb was middle of the pack but I attribute that to two factors: I was heavy on the glider, as mentioned, and I was new on the glider. I learned later to be more on top of the glider in broken conditions and to put it where I wanted to.

Concerning sink rate, the larger size (more appropriate for my weight) has been getting raves for how much it slows in a turn to allow a pilot to circle tightly, and how well it handles at these low speeds.

The glider I had (a demo) handles in a medium manner in choppy air and on tow. In big, regular thermals it was very easy to coordinate and imposed nice corkscrew tracks on the sky. In most cases I found adding about 1/8 VG would stabilize the glider enough in roll that I could best merge with a metamorphosing thermal.

Since I flew the Stealth in a tow meet, I can't say much about launch other than the glider is nicely balanced and therefore easy to run with. Landings were straightforward and easy. I had all fine landings (about 10) except on a day of extreme turbulence.

Most pilots want to know about the pitch stability of topless gliders. The matter is very difficult to quantify without a test vehicle, but the Stealth 13's bar pressure progressively increases as you move the bar kneeward. I had one 10-mile dive to goal with the belly bar on my fingertips and my knees bent. The glider felt solidly positive as I banged through thermals and bashed through ground turbulence to skim across goal.

The Stealth 13 is going to tally up a lot of airtime in the U.S. skies, if only because of its attractive price-to-performance ratio. But other inducements include its super-clean sail and availability and parts support. G.W. Meadows of U.S. Aeros has pledged to keep all material in stock for quick delivery to pilots in need.

The parent company, Aeros of the Ukraine, maintains a busy all-encompassing facility with a determination to make the best gliders in the world. They've made a good start with the Stealth, which has been refined over the past couple of years. If you're in the market for more performance, arrange a demo on the Avis of personal aviation.

For information on gliders, dealers and demos, contact: U.S. Aeros, 1125 Harborview Dr., Kill Devil Hills, NC 27948 (919) 480-2774, fax (919) 480-0117, justfly@interpath.com, www.justfly.com. ■

STEALTH 13 SPECIFICATIONS

<i>Sail area</i>	13.2 sq. meters — 142 sq. ft.
<i>Span</i>	9.9 m — 32.5 ft.
<i>Aspect ratio</i>	7.4
<i>Nose angle</i>	128° to 130°
<i>Pilot weight range</i>	55 to 85 kg. — 121 to 187 lbs.
<i>Pilot optimum weight</i>	70 kg. — 153 lbs.
<i>Glider weight</i>	33 kg. — 72.6 lbs.
<i>Minimum sink</i>	0.9 m/s — 175 ft./min.
<i>Airspeed operation</i>	29 to 110 km/h — 18 to 68 mph
<i>Breakdown length</i>	3.8/5.7 m — 12.5/18.7 ft.

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FASZINATION DES FLIEGENS
www.braeuniger-flugelectronic.de
AEROLIGHT USA, Inc., 1355 N.W. 93 Ct. Unit A-105, Miami, FL 33172
Tel: (305) 639-3330, Fax: (305) 639-3055
paragliding@aerolight.com, <http://www.aerolight.com>

Brauniger Flugelectronic
Püttrichstr. 21
D-82362 Weilheim
Tel. +49-881/64750
Fax +49-881/4561
braeuniger-gmbh@oberland.net