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(Almost) Carbon-Free

The "Xenon" by Aeronaut

A good slope'n and soaring buddy of mine once coined the following saying: "Money gets you up higher!" What he meant was that, in his opinion, the high-priced, all-molded glass and carbon slippers for F3J/F3B will climb faster in thermals and stay up longer. The "Xenon" by Aeronaut, a new release for 2010, seems to be an interesting alternative for those who don't want to participate in the arms race, yet still mix it up with something built in the classic way and at a moderate expense.

The basic concept is promising: Light-weight construction and a four-servo wing with a 2.5-meter wing span and polyhedral at least look like good prerequisites for thermal performance. The airfoil is the proven "SD-7037" transitioning to "MH-30" and then to "RG-14.5". Just how exactly this is accomplished, Aeronaut won't say. But who cares, so long as it works.

As we've come to expect from Aeronaut, all parts in the box were well-packed. With the bubble-wrap removed, flawless parts emerged: a light-weight, white fiberglass fuselage with a fine seam line; a three-piece, classically built-up wing, a slab-balsa horizontal stabilizer, and a bag of accessories containing everything needed for completion of the model. Also included is an extensive German manual complete with many photos, which guides the builder precisely through the assembly.

A closer look at the fuselage reveals a hairline along which those who wish to install electro power can cut off the nose; a fiberglass motor mount is included in this case. After weighing all parts and gathering the electronic gear, I decided to electrify this model. With a light-weight 3s LiPo pack, the flying weight should remain under 1,500 grams; that would be quite good given the glider's size. The short nose and the servos located in the tail, made me wonder, however.

The weights out of the box are:

Fuselage:	190 g
Wings:	641 g
Rudder:	20 g
Elevator:	53 g
Small parts:	118 g

For the power train I used a brushless outrunner. 35 millimeters in diameter and 48 millimeters long, with a kV of 800. This motors spins a Graupner CAM prop 13x7 at 6,900 RPM while drawing only 24.3 Amps from the 3s LiPo pack. The latter has 2,200 mAh capacity and is connected to a 40-Amp controller. Six Hitec "HS-82MG" and a Jeti "R8" receiver complete the set-up.

Let's build out the fuselage first: I cut off the nose along the hairline mark as accurately as possible. With motor mounted, I positioned the motor mount and slid on the spinner. This way, I could place the motor mount precisely. I carefully removed the spinner and tacked on the mount with a few drops of CA. After removing the motor, the mount could be epoxied in properly and the cut surface at the nose sanded smooth and parallel to the spinner's rear edge. Next up were the linkages for elevator and rudder. The horizontal stab is removable and held in place by a long screw inserted through the bottom of the fuselage. This required the installation of a guide and reinforcement in the fuselage, which was done easily through the servo well with a litle trick and thanks to the fact that it all fit perfectly. The tail servos are installed in their prepared servo pockets. The linkages consist of carbon control horns, steel push-rods with a Z-bend on one end, a threaded coupler for the other end and plastic clevises. Everything is assembled quickly and provides slop-free connections. The 12-mm Hitec servos fit comfortably into the wells. I just glued them to the perfectly-fitting fiber glass covers, which then are supposed to be fastened to the fuselage with small sheet screws. However, I decided to just tape them on, a method I'm familiar with.

With the tail servos out of the way, there is plenty of room up front for the battery, the controller, and the receiver. I placed the Jeti receiver under the wing bolts, and velcroed the controller to the fuselage side under the canopy. There was lots of room left even for a "fat" battery pack, something which would come in handy later. No battery tray is included in the kit, so I quickly fashioned one from 3-mm plywood. I glued hook and loop fasteners to the tray, and this way, batteries are changed quickly and easily, and they don't slide around. Installing the hardware arresting the canopy (a fiberglass tongue and some music wire) finished the fuselage, and the wings were up next.

For the three-piece wing, only the wiring harness needed to be solder up, everything else fit together already. I glued the servos to the top wing sheeting and covered them with the included plastic covers. I used a pair of the green 6-pole Multiplex connectors to hook up the wing wiring to the fuselage harness. The ailerons deflected only four millimeters downward, and I wondered if that would suffice. I didn't want to cut of the nicely-hinged ailerons, so I will have to find out during the first flights. If needed, I can always mix flaps with ailerons.

After a pleasant and relaxed final assembly, the "Xenon" was put on the balance stand, and what came next was pure horror: To achieve the recommended CG of 75 mm behind the leading edge, not even the weight of two of the 3s LiPo packs sufficed. By adding lead, balance was achieved eventually, but not until 540 grams had been added to the nose! I was very disappointed, because I had wanted a well-thermaling floater. Sure you can blame me for not using the lightest servos in the tail, but I couldn't have saved more than 17 grams.

Frustrated, I bought a bigger 3s LiPo pack; if I have to add weight anyway, it might as well be good for something. With this 5,200 mAh honker, I still needed 110 grams of lead in the nose. The scales now showed the portly weight of 1,923 grams, 28 percent more than advertised! Wing loading was almost 36 grams per square decimeter (about 12 ounces per square foot), and thus more like that of a warm-liner than a floater.

After the obligatory range (never skip it even with 2.4 GHz) and control checks, I handed the "Xenon" to an experienced launcher who took three steps with motor-on and sent the glider on its way. The plane climbed nicely at about a 30-degree angle, and I turned off the motor and let the "Xenon" glide. Somehow, it still seemed to be tail heavy. It was dragging its tail, didn't want to move out, and the slightest elevator application made it pitch up and down quickly. So I did a dive test: there was no recovery, the plane headed toward the ground in a straight line. Back up at safety altitude, I tested crow, which worked well with the model in a slight nose-down attitude. So let's land and add nose weight.

After adding 60 grams of brass, off we went again. That was an improvement. Pitch response was tamed, and the plane recovered slowly from the dive test. The "Xenon" also was flying a bit faster, yet remained docile. Circling in thermals went well also, the model kept the turn well with the rudder but needed a bit of opposite aileron to hold the bank angle. The plane misses small bubbles, and bigger thermals require pilot concentration to keep the glider in the best lift. That's where I had hoped the "Xenon" would perform better, but this is the price we pay for the extra weight.

The "Xenon" also had to suffer an involuntary strength test: after the down-wind leg over the 2-meter tall corn and the left turn on final, boom, there was the tip stall. A classic one: wing drops, nose digs in, and the plane just lays there and looks sad. It had dropped about two meters onto the grass, but suffered only a dislodged motor mount, nothing else! The wing didn't have a scratch.

Because the model now needed to go back to the shop anyway, I decided to put it on a weight-loss program. I moved the tail servos as far forward as possible. For this, I made a small tray and epoxied it in under the wing. I glued in a plastic "bowden" pushrod for the elevator, while the rudder linkage needed to be a 1-mm music wire inside its plastic sleeve, because it needed to curve a bit. The tail servo covers made for the perfect place for the pushrods to exit in the back. These measures allowed me to remove all nose weight, and I had achieved an all-up weight of 1,813 grams with the CG set at 70 millimeters.

After this weight loss, the "Xenon" could go back to the field. The lower weight allows for a better climb and a slightly lower cruise speed. While thermal response still isn't all that great, smaller thermals can now be used. Adding camber unfortunately does not increase thermal performance significantly, and the strength of the wing is not meant for high speed, so a speed setting also is not needed.

Rolls are slow and use up a lot of altitude, while loops are nice; but don't fly them too tightly so as to not over-stress the wing. The small down-aileron deflection doesn't seem to matter, the "Xenon" responds promptly and smoothly to aileron input. Due to the big battery pack, 11 minutes of full throttle are possible with 25% of capacity remaining in the pack. Given that fact and the good soaring ability of the "Xenon", I can fly a whole afternoon on a single charge, so long as a few thermals can be found here or there.

The "Xenon" is an easy-to-own, low-stress, all-around glider which can be flown almost anywhere. It has no special abilities but also no big weaknesses. It's great for an after-work flying session or to go find some lift on a calm day at the slope. Unfortunately, it cannot fulfill expectations based on the published weight by Aeronaut. Thermal response is average, and the model definitely is no floater. This is too bad, because the concept is great, but for now this model is not a choice for an ambitious thermal pilot, who may need to drop more dough on something with more carbon in it after all.

Markus Kirstein

Facts

"Xenon" by Aeronaut – An electric-powered thermal glider

Wing span:	2,500 mm
Length:	1,340 mm
Weight:	1,813 g
Wing area:	53.5 qdm
Wing loading:	33.8 g/qdm

Control throws:	
Elevator:	+/-10 mm
Rudder:	l/r35 mm
Aileron:	+4/-10 mm
Crow:	
Aileron:	-6 mm
Flaps	+maximal
Elevator:	+3 mm
Center of gravity:	70 mm

Price: 299 €; available at dealers, www.aero-naut.de

Photo Captions:

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- The canopy is curved and fits well onto the fuselage.
- An example of quality construction: the connectors fit and align themselves perfectly without any extra work.
- Using this 2-mm threaded rod as an aid, the guide for the elevator mounting bolt could be positioned and glued in perfectly.

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- If you place a small board with sand paper between spinner and fuselage and press down and twist a few times, you get a perfect spinner-to-fuselage fit.
- The new position of the tail servos under the wing saves nose weight.
- The "Xenon" is in the class of popular electro gliders spanning around 2.5 meters.

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- The "Xenon" is a good-looking and modern purpose glider. It's relatively high flying weight does require the pilot to let it glide, however.
- Some aerobatics are possible, but keep an eye on the wing bend when horsing around.