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## ~ English ~


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aerodynamic or flight mechanics advantage to distinguish one from the other in this size of model. So the practical aspects take precedence. The cross tail is easier to build, probably works as well as any other, and is robust.

The Alpenbrise is now finally in production after five years and I am happy to say that despite some teething problems, the model is working as well as I had hoped.

*James Hammond*

## Facts

Alpenbrise Composite RC Gliders
A high-performance sports model

| | |
|---|---|
| Span | 4,000 mm |
| Length | 1,800 mm |
| Weight | 4,900 g |
| Area | 76.3 dm² |
| Surface load | 64.22 g/dm² |

*Price: from 1.990,- Euro; purchase at Composite RC Gliders, www.composite-rc-gliders.de.*

## Captions:

*Page 12*
- Sebastian Franken from Composite RC Gliders flew the prototype extensively before the model went into production

*Page 13*
above - When all the parameters and construction details were ready, the CAD threw out a shapely model.
below - With the Alpenbrise, after five years of development, an alpine, slope and GPS triangle glider model has come out

*Page 14*
- The large flaps help to make precise landing approaches
- The three-sides view shows the essential design features as described in the text

*Page 15*
- James Hammond with one of the first Alpenbrise models

*Page 16*
- Computer simulations were made by Composite RC Gliders.
Top left (cl/alpha) shows lift via angle of attack. The top right of the picture shows the stall.
Top right (cm/alpha), the moment coefficient over the angle of attack, Important for the later calculation of the longitudinal stability. This always occurs when the torques between the wing and the tail unit are equal. In other words, the angle of attack at which these two moments are equal defines the operating point of the longitudinal stability.
At the bottom left (cl/xtr-top), the diagram visualises the lift forces along the professional chord and thus also shows the detachment point of the laminar flow to the turbulent flow. This can be found at about 40 percent in the slight downward bend. In the wind tunnel, this kink is much stronger, which in turn shows that the wind tunnel is still superior to the simulation.
The bottom right (cl/cd) shows that the ratio between the lift coefficient and the drag coefficient is nothing other than the glide ratio of the airfoil. In this case, it is only the theoretical value of the airfoil. The glide ratio of the model is determined in a similar, but more complex calculation and is significantly lower than the maximum value of 70 shown here. However, the value can be used as a comparison between different airfoils.
- With the JH35-9 a newly designed and already tested profile was used

*Page 17*
- The prototype was motorised with a Hacker-A40-10S V2 8-Pole kv1600, 6.7:1 gearbox and 6s-LiPo

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# Strong in the thermals

## The Hawk NG Spark F5J from VR-Model

*Thorsten Rauber's next model was to have a wingspan of at least 3.5 meters, be light, thermally strong, and of shell construction. And electric. He found what he was looking for at Daniel Rette and Vladimir Rucka in Slovakia. In Germany, the model is available from Pollack, among others.*

Sometimes it can be so simple: A short email with basic questions and contact was established. A quick reply brought joy. Daniel Rette told me that there would soon be a brand new version of their top F5J model: Hawk NG Spark, four-meter wingspan, triple V-shape. You can choose the angle of the outer ears between 6.5 degrees and 8.5 degrees. Two different carbon connectors are supplied for this purpose. There is also a ballast system in the wings for up to one kilo of brass.

The model is offered in several construction versions:
- „Light“ with 20 g/m² biaxial carbon, Rohacell support fabric, and 15 g/m² GRP (flying weight: 1,300 g).
- „Standard“ with 40 g/m² biaxial carbon, Rohacell support fabric, 30 g/m² GRP and 30 g/m² Spreadtow D-Box (flying weight: 1,450-1,500 g).
- „Storm“ with 160 g/m² carbon, Rohacell backing and 50 g/m² spreadtow (flying weight: 1,750-1,850 g).
- „GPS“ with 160 g/m² carbon, Rohacell support fabric, 50 g/m² spreadtow and double spar (flying weight: 1,800-1,900 g).

I opted for the „standard“ version of the model: I find about 1,500 grams on a four-meter wingspan good and am sure that even very weak beards can be cranked out with it. Also, the standard layout is probably the best choice for the everyday pilot. If you also want to fly it on slopes, you don't always have the best landing conditions and are happy if the shell is a little more robust.

Daniel also advised me well on the subject of servos and drive. For the servos, I chose KST-“X10 mini“ for the flaps and KST-“HS08A“ for the ailerons and tailplane. The stable „X10 mini“ on the flaps were chosen with care. How quickly it happens that you retract the flaps a little too late when landing or you touch down a little roughly. Due to the really large flaps of 9.5 centimeters depth, large forces act here on the servo or the gearbox. For the drive I ordered the EDF Teenshock 1515/13T with 4,200 Kv and a 5:1 gearbox from Reisenauer. In addition a 14 x 7 inch propeller with a spinner from GM. The whole thing is on a 3s-LiPo with 1,300 milliampere-hours capacity. As a controller, the YGE 65 LVT“ fits the model perfectly and at the same time offers the full telemetry bandwidth for most protocols. This includes, for example, battery voltage, used capacity, motor speed, and motor power. The desired voltage for the BEC can also be conveniently set via the PC software. Since the KST servos are all designed for 8.4 volts and thus provide the best performance, I have also set it this way.

Although the model is delivered in a very prefabricated state, I still decided to use the manufacturer's building service. The Hawk NG“is delivered as standard with the IDS linkage prepared and the servo frame already installed, as well as fully wired wings including connectors. In my case, the model was delivered completely built, I only had to install the receiver and the vario. Eight weeks after ordering, I received the first pictures of the model fresh out of the mould. Daniel and Vladimir immediately set about installing the RC components.

A few days later, I received a large, sturdy cardboard box. Even if you have already seen pictures of the model and the design, it is always exciting to see how it looks in reality. So I quickly unpacked the model and put it together in the garden. I was thrilled, the luminous colours really came into their own. My first thought was when I held the three surface parts in my hand: Wow, they are light. On the other hand, the fuselage made a very stable impression. In my opinion, this design is exactly right. When you have to land to the second in a competition, it can happen that the model is pushed down a bit roughly onto the ground. The fuselage should be able to withstand this. The GM spinner and propellers have a flawless finish. The carbon look and the perfectly fitting blades rounded off the whole.

The next step was to test the construction service. A small, stable CFRP board was glued into the nose of the fuselage, onto which the KST HS08A were screwed. The linkages and pushrods look clean and stable. Another point is, of course, the freedom of play and ease of movement of the rudders or the linkages. Only if this is given, the rudders can precisely return to the zero position. The elevator and rudder linkages are plugged in when the tailplane is assembled.

Before I started with the receiver installation and programming, I took a look into the servo bays of the wing. Thanks to the complete completion of Daniel and Vladimir, everything was ready here as well. They were firmly screwed into 3D-printed servo frames. The cross-linkage and the IDS were neatly solved and also aerodynamically an absolutely contemporary solution.

After inspecting all the parts, I packed the Hawk into the workshop with great satisfaction and began installing the Jeti receiver and variometer. With a center of gravity of 114 millimeters from the leading edge, the Hawk NG now weighed 1,545 grams. To achieve this center of gravity, I pushed the battery all the way back and glued five grams of trim lead into the fuselage tube below the rudder. For the adjustments, a sheet with the recommended settings was enclosed with the model.

Two days later I was standing on the western slope with no wind. As expected and completely unspectacular, the model glided out. Despite the feeling of dead air, there was hardly any sinkage. After a few meters of straight flight, the model already indicated the first upwind field or slight thermal. A slight twitch upwards on the left outer wing signaled to me that something was moving there. Now there were two possibilities. Either the right-wing caught a downwind field or, what I naturally hoped for more, the left-wing was through a thermal bubble. I immediately ignored the downwind field option and let the Hawk NG circle around to the left. The effect of the rudder was absolutely impressive. And indeed, my feeling was not wrong: the variometer signaled a slight climb. After gaining a few safety meters, I wanted to test how good-natured the Hawk NG is, or at what point it becomes critical. I fully deflected the rudder and did not operate anything else. The Hawk made tight circles and increased its speed. The variometer beeped happily and so I continued to gain height meter by meter. As usual, the next step was to test the butterfly function. I was very curious because the Hawk has really huge flaps, which are lowered by 80 degrees during butterfly. On the transmitter, as usual, I put the depth rudder mixture for the butterfly on a rotary encoder so that I could adjust it directly. However, not much correction was needed here: the Hawk visibly reduced its speed and took the nose down slightly. After a few seconds, it really looked as if the model was standing in the air. Even vertically downwards and with the brake fully applied, the Hawk hardly made any progress.

As expected, the very large flaps have an enormous braking effect. Another advantage of the large flaps is that you can change the camber considerably and thus have the right setting for every situation. Two thermal phases are recommended. Some people probably think, why do you need this, that's how I felt. However, the difference between the two phases is very noticeable. Even with the lower camber, the Hawk can be flown very slowly and precisely. If you activate the second thermal phase and thus increase the warping, the model becomes even slower. After some nice flights that morning, the Hawk became the topic of conversation among colleagues on the slope. My first impression of the flight characteristics was good and I was thrilled at how thermally strong and uncritical the model was to fly.

The very next evening I was already at the airfield with the Hawk and wanted to test the beautiful model on the flat. Thanks to the powerful drive, the take-off was completely problem-free. The Hawk climbs vertically with this setup. The attraction of models for the F5J class is, of course, to get a thermal connection at the lowest possible starting altitude and to achieve a long flight time. Although the sun was no longer shining so strongly, I still found warm air above the maize field several times and it turned out to be a very nice evening flight.

I was invited to a flying day at MFC Kusterdingen and was supposed to give the spectators an insight into F5J flying. But so that it wouldn't be boring for the spectators, we agreed to reduce the flying time from ten to five minutes. Quickly set a timer on the transmitter to run down five minutes. Every full minute the transmitter announced. At the last minute, all ten-second increments were announced. Then in the last ten seconds, it counted down every second. As a landing point, I put a tea towel on the landing field. After the take-off, the presenter stood next to me to keep an eye on the timer. After all, the spectators want to know how the time is going. At 100 meters altitude, I switched off the engine and the time was running. Now it was time to find thermals. Five minutes doesn't sound long. But if you don't have any supporting air, you can't manage five minutes from this altitude. The first two minutes were absolutely dead and I decided to change the location again. Lo and behold, at about 40 meters I noticed a very slight climb and immediately tried to center this delicate beard cleanly. There was no big climb, but it was enough for a zero slider. I have to admit, I was a bit tense. Falling out of the beard now would mean that I wouldn't make it to the five-minute flight time. So I was able to keep the model in the window between 50 and 60 meters altitude for the rest of the time. At the beginning of the last 35 seconds, I started the landing approach. My tension increased and the presenter announced the remaining time over the microphone. The last ten seconds were running and every second was announced loud and clear.

Exactly when the presenter announced the zero second, the fuselage tip also touched down on the landing point. A great feeling.

In short, adding the Hawk NG Spark to my hangar was 100 percent the right decision and makes me want more.

*Thorsten Rauber*

## Facts

*F5J model Hawk NG Spark*
*A new high-performance glider*

| | |
|---|---|
| Span | 3,983 mm |
| Length | 1,840 mm |
| Weight | from 1,300 g |
| Area | 80.74 dm² |
| Surface load | from 16.1 g/dm² |

*Price: from 1.790,- Euro; purchase at Modellbau Pollack, phone: +49-981/14224, www.modellbau-pollack.de.*

## Captions:

*Page 91*
01 | The manufacturing quality of the model is without fault.
02 | The wing servos were installed with 3D-printed servo frames
03 | The elevator linkage is automatically connected when the tail is tightened

- The Hawk NG Spark is a typical representative of the popular F3J/F5J class

*Page 92*
01 | The tail servos in the fuselage were also mounted horizontally
02 | GM propeller and spinner perfectly match the slim fuselage
03 | The gearbox drive comes from Reisenauer
04 | The IDS drive is mounted almost invisibly