WOLFGANG WERLING,
AERIAL SHOTS:
HANS-PETER WAGNER

Wirbelwind EDF, Part 1

HISSING **MOTOR GLIDER**

What does the Wirbelwind have in common with the day care centre in Hatzenbühl? The name. My wife works there, I thought the name was suitable for an EDF model. Many thanks also to the director Gudrun Werling for providing the name. The Wirbelwind is basically a continuation of my electric crow with pusher propeller. Since EDF´s have achieved much better efficiencies in recent years, even in small designs, and the sound is great, I designed the Wirbelwind for a 69 mm EDF. The goal was a good-natured motor glider in the look of the old gliders, but with modern propulsion and good flight performance. For the FMT readers who don't like EDF´s, I have considered the possibility of a train propeller in the plan and in the milled parts.

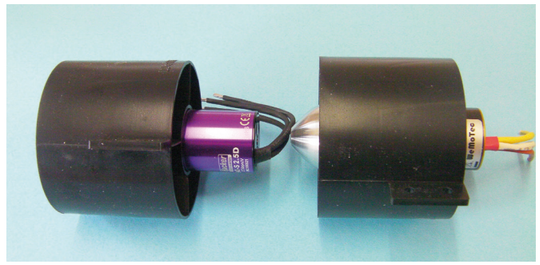
It also works: If you just can't do anything with EDF, simply mount a classic drive with a traction propeller.

About the construction

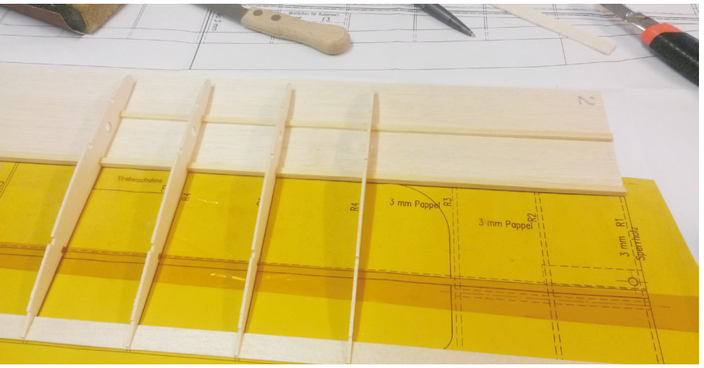
The new aircraft is light and yet robust. Construction is no more difficult than with a „normal" model. The wing can be divided and withstands all loads in the air. The two tailplane beams are light, stable and look better than pure tubes. The servos located under the tailplane ensure rudders without play and avoid complicated linkages. Due to the V-shape of the wing and the low center of gravity, the Wirbelwind can also be flown with rudder only and is almost suitable for beginners in terms of flight behavior.

Ready for painting: the inlet ring with the balsa layers.

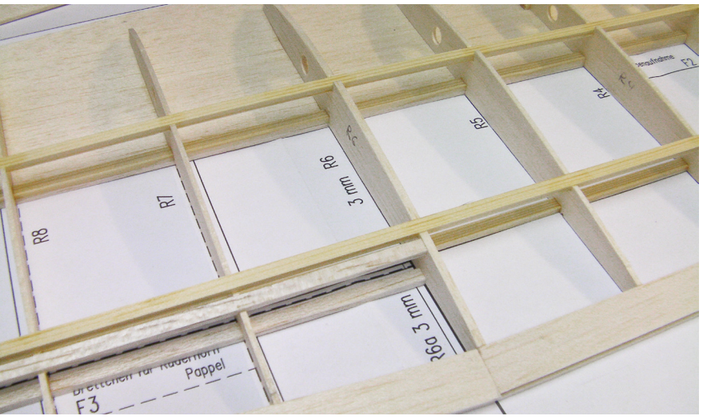
On the left you can see the original inlet ring, next to it the reduced version.



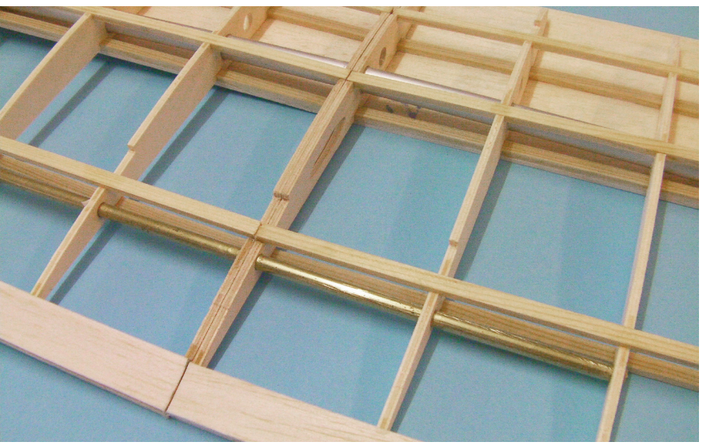
The EDF options: On the left the longer Hacker Streamfan, on the right the WeMoTec solution.



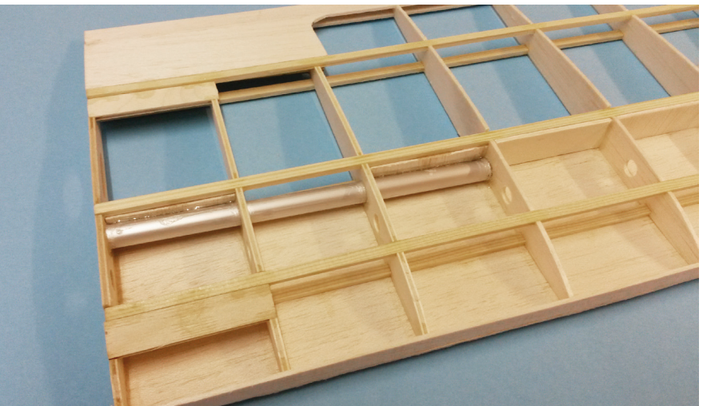
Glue the main spar F10 and the ribs R4 to the lower planking.



The ailerons are built directly into the wing and sawn off later to achieve the greatest possible profile fidelity.



The plug-in is inserted here on a trial basis and the root ribs are aligned with each other - now you can glue.



The spars are snapped together and the screw reinforcements F1 are glued in place. Since I used an 8 mm CFRP rod instead of 6 mm steel for the mating, the front mating tube is made of aluminium.

I used an SD 7037 mod. profile with a setting angle of 1.5°. This aerofoil is a real all-rounder with good glide performance even in wooden construction and uncritical breakaway behaviour. To place the centre of gravity further back, the tailplane was adjusted 0.5° upwards. This has another advantage: when the throttle is opened, the tailplane is pushed upwards, which prevents the model from rearing up due to the drive being located under the wing. The Wirbelwind would also be conceivable as a pure glider; since the impeller behind the centre of gravity is omitted, only a little lead is then needed in the fuselage nose.

The drive designs

The proposed pull drive from Hacker is light and easily sufficient for good flight performance. The centre of gravity can also be easily adjusted with it. Basically, however, the Wirbelwind is designed for an EDF. The components listed below are available at fair prices, are durable and produce a pleasant sound like a turbine. Since the EDF sets are dynamically balanced by the manufacturer, there are also no vibrations.

The positions of EDF, ESC and LiPo are chosen in such a way that the centre of gravity can be easily reached with the versions mentioned. The cables between the LiPo and the ESC do not need to be lengthened, only a few centimetres are needed between the regulator and the EDF. However, this is generally no problem and does not require any additional support capacitors.

The Minifan from WeMoTec is very light with 146 g for motor and fan and achieves enough thrust with 3s-LiPos for ground take-off from the lawn. The alternative Hacker-Stream-Fan is considerably heavier at 220 g, but this is compensated for by the 4s-LiPo in the nose. The rule of thumb for reaching the centre of gravity: If the EDF weighs 220 g, the LiPo should weigh at least 350 g. With EDF weights of 146 g, the lower limit for the LiPo is about 200 g. If you want to use even lighter LiPos, you should use lighter servos in the tail unit or put some lead in the nose.

WeMoTec and Hacker each have a suitable nozzle and an inlet lip. This must be modified slightly, see the construction plan. In general, you can also fly without the lip. This reduces the power consumption and thus the performance, because simply less air is fed into the impeller. This can amount to 10 to 20% when stationary. Since the cockpit and the bulkheads in the fuselage are open anyway, I also cut an opening in the balsa planking in front of the impeller (see plan) to get additional air to the impeller. Whether this really makes a difference I don't know, but it gives you a good feeling....

Drive option traction propeller	
Motor:	Chipper A30 10 L (145 g)
Controller:	Hacker X40 SB-Pro
Measured value:	35 A with 3s TopFuel 20C 2,400 mAh (192 g) with 9x6" prob
Resulting flying weight:	approx. 1,650 g

Drive option EDF 1	
Impeller/motor:	WeMoTec Minifan Evo with Het 2W16 (146 g)
Measured values:	51 A, 566 W, 980 g thrust with 3s 3,700 mAh Lemon RC 35C (290 g)
Resulting flying weight:	1.730 g

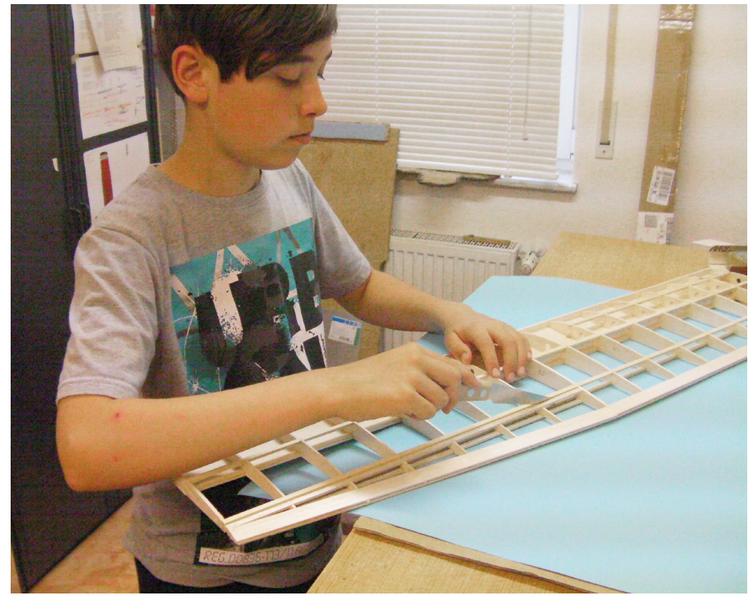
Drive option EDF 2	
Impeller/motor:	Hacker Stream-Fan 70/3400 (220 g)
Measured values:	56 A, 830 W, 1,460 g thrust with 4s 3,800 mAh Topfuel 20C (400 g)
Resulting flying weight:	1.900 g

For both EDF options	
Inlet lip:	WeMoTec MiniFan pro
Nozzle:	WeMoTec MiniFan pro, 8 cm long
Controller:	Master Spin 80 Pro, timing 7°, brake medium

The EDF unit

The nozzle from WeMoTec can be used without reworking. It is required to increase the jet speed and serves to visually disguise the engine. There is also an exactly fitting inlet lip, but this is designed for installation in fuselages and must therefore be modified in the outer diameter. To do this, grind the lip slightly on a grinding board on the front side - this gives you a central mark. The lip is then cut to this mark, which can be done very well with a fretsaw. First glue the middle layer of 2 mm balsa onto the contact surface of the ring. You should moisten the balsa well, I used superglue here. Now adjust the outer diameter of the ring to the height of the balsa strip, as the outer layer of balsa is then glued on top. Finally, a layer of 2 mm balsa is missing on the inside. This way the new ring fits exactly on the impeller shell, I did not glue it additionally.

The whole thing should be sanded well, see also the sectional view in the construction plan. I hardened the entire balsa with thin super glue, which also serves as a pore filler before painting with matt black lacquer from the spray can. This should be done outdoors or at least well ventilated. If you want, you can also wrap the impeller housing with thin balsa, then you should sand everything and paint it afterwards. The complete unit is later fastened with wood screws.

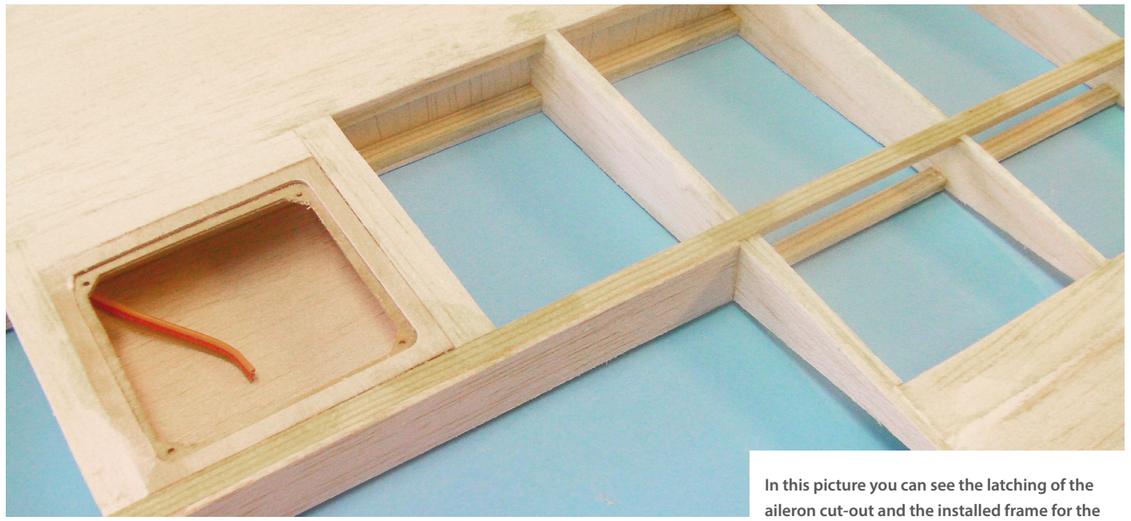


My son Paul cutting off the ailerons. The saw is guided through the strips F11 and F13.

Start of construction of the wing

First cut the lower planking, which consists of nose and end rail planking. Then glue the lower main spar to the planking and fix it to the building board with adhesive tape and weights to prevent it from slipping. Then place all the lower spars on the planking and the building board. Note: The rear auxiliary spar F11 lies directly on the building board, there is no planking underneath. By the way, the position of the lower spar is shifted slightly forward to get enough deflection downwards at the rudder later. All R4 ribs are now glued to the planking and spars; make sure that they rest on the rear end strip planking. The planking in the nose area is glued on later. Now glue the ribs R5 to R13 in the same way. The ailerons are built directly and cut off later; this is faster and more accurate than building them separately.

The next step is to glue the ribs R2 and R3, the root rib R1 is glued to the ribs first. Then glue all the upper spars to the ribs to



In this picture you can see the latching of the aileron cut-out and the installed frame for the servo cover.

Parts list

Pos.	Amount	Component	Material
Hull			
1	1	Nose	Balsa n. Drawing
2	1	Frame	Plywood 3 mm
3	1	Frame	Plywood 3 mm
3a	1	Half-frame	Poplar plywood 3 mm
4	1	Half-frame	Plywood 3 mm
4a	1	Half-frame	Poplar plywood 3 mm
5	1	Frame	Plywood 3 mm
5a	1	Board	Poplar plywood 3 mm
6	1	Frame	Plywood 3 mm
7	1	Half-frame	Plywood 3 mm
7a	1	Half-frame	Plywood 3 mm
8	2	Fuselage side panels	Poplar plywood 3 mm
8a	1	Tailplane frame	Plywood 3 mm
8b	1	Tailplane frame	Plywood 3 mm
9	1	Threaded board front	Plywood 3 mm
10	1	Rear threaded board	Plywood 3 mm
11	1	Bonnet frame	Poplar plywood 3 mm
12	1	Torso belt	Poplar plywood 3 mm
13	1	Bonnet belt	Poplar plywood 3 mm
14	1	Surface support	Plywood 3 mm
15	2	Tail boom	Poplar plywood 3 mm
16	2	Chassis side panel	Plywood 3 mm
17	1	Chassis strut	Plywood 3 mm
18	2	Fuselage side panels below	Balsa 3 mm
19	2	Fuselage side panels top	Balsa 3 mm
20	2	Spur	Poplar plywood 3 mm
21	2	Bonnet side panels	Balsa 3 mm
22	6	Cover planking	Balsa 3 mm
23	2	Front bottom cross-grained	Balsa 3 mm
24	div.	Bottom cross grained	Balsa 3 mm
25	div.	Triangular ledge	Balsa 6×6 mm
26	2	Torso belt below	Pine strip 5×3 mm
27	2	Top torso belt	Pine strip 5×3 mm
28	4	Strut longitudinal member	Pine strip 10×3 mm
29	4	Strut planking	Balsa 2 mm
30	1	Chassis	Steel 4 mm
31	1	Cockpit window	Packaging material

Tails			
S1-S5	1	Moulded parts	Balsa 6 mm
S6	div.	Last	Balsa 6×6 mm
S7	div.	Last	Balsa 6×12 mm
H1	1	Centrepiece	Balsa 6 mm
H2-H4	2	Moulded parts	Balsa 6 mm
H5	div.	Last	Balsa 6×6 mm
H6	div.	Last	Balsa 6×12 mm
Area			
R1	2	Root rib	Plywood 3 mm
R2	2	Plugging rib	Poplar plywood 3 mm
R3	2	Plugging rib	Poplar plywood 3 mm
R4	8	Rib	Balsa 2 mm
R5	2	Rib	Balsa 2 mm
R6	2	Rib	Balsa 3 mm
R6a	2	Partial rib	Balsa 3 mm
R7-R12	2	Rib	Balsa 2 mm
R13	2	End rib	Balsa 3 mm
F1	4	Screw reinforcements	Plywood 3 mm
F2	2	Strut mount	Plywood 3 mm
F3	2	Rudder horn mount	Poplar plywood 3 mm
F4	2	Edge arch	Poplar plywood 3 mm
F5	2	Nose strip	Balsa strip 4×10 mm
F6	2	Auxiliary leading edge	Balsa 2 mm
F7	div.	Planking	Balsa 2 mm
F8	4	Assisting Spar	Pine 5×3 mm
F9	div.	Latching on edge	Balsa 2 mm
F10	4	Main spar	Pine 5×3 mm
F11	4	Rear spar	Pine 5×3 mm
F12	2	End strips	Balsa 6×35 to 40 mm
F13	4	Rudder spar	Balsa 5×3 mm
F14	div.	Rudder lock	Balsa 2 mm
F15	1	Spring steel	d = 6 mm (outside)
F16	2	Brass tube	d = 6.1 mm (inside)
F17	1	Spring steel	d = 4 mm (outside)
F18	2	Brass tube	d = 4.1 mm (inside)
F19	2	Brace, approx. 395 mm long (opt.)	Pine strip 10×3 mm

get a torsion-resistant body shell. Now you can remove the wing and glue the lower planking in the nose area. Alternatively, leave the wing on the building board and press the nose planking on using pieces of the end strip and glue it in place.

The joint can now be prepared and put together on a trial basis, including the R1 root rib. First glue only one side of the joint, so that you can always correct it if something is stuck when you put it together the next time. If everything fits, glue the second side including the root ribs. The spars are locked with standing grain and the screw reinforcements F1 are glued in place. Since I used an „unemployed" 8 mm CFRP rod instead of 6 mm steel for the mating, the front mating tube is made of aluminium in my case; however, the holes in the mating ribs must be adjusted for this.

Cut off aileron

After applying the upper end strip planking, cut off the aileron. The Kataba Restauro pull saw (VTH part number 6211157) or a saw blade is suitable for sawing through the ribs. Guide the ribs exactly through the strips F11 and F13. The rudder and the cut-out of the wing are cemented with balsa to achieve sufficient torsional stiffness.

Milled parts and material set

The quickest way to build the Wirbelwind is with our routed parts set or the material and routed parts set:

- The **milling parts set** includes all components such as ribs and frames made of balsa and plywood in selected quality. Planking material and some battens are still needed. Art.No.: 621 1801, Price: 164,95 €.

- In addition to the **milled parts, the material and milled parts set** also includes the planking timbers, battens, the plug-in, the wheel axle. Art.No.: 621 1802, Price: 199,95 €.

VTH-Order-Service: Tel.: 07221 5087-22, E-Mail: service@vth.de, Internet: http://en.shop.vth.de

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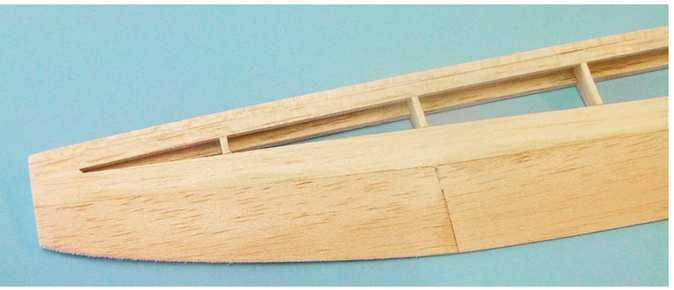

The ailerons are planked and fitted with a rounded end strip.

Reinforce the edge arch with balsa strips and fit it to the wing profile.

Before planking the top side, glue the auxiliary leading-edge strip F6 to the ribs and sand over the entire top side. For the servo cover I glued in the frames and pulled in the servo cables.

Now cut the upper planking to size, coat the ribs and spars with UHU hart or PVA and place the planking on the main spar first. Press it down well and fix it with tape and pins. Then press the planking against the ribs up to the auxiliary leading edge and fix it. The surface is now placed flat on the building board and weights are applied. Allow to dry well.

Then cut the end strips F12 and glue them to the wing and aileron, in the outer area they will later be adapted to the curve of the wing tip. Fix the rim bow to the last rib by means of pins so that no twisting occurs. The 3 mm padding increases the strength and serves to adapt to the wing profile.

To fix the wing struts F19, the boards F2 are glued into the wing. I have screwed on the struts here in a hinged manner using rudder hinges. When upgrading, you only must attach them to the fuselage - and you can't forget them. They only serve the optic, but you can also leave them out. So much for today. In FMT 12/2018 we will build the tailplane, tail boom and fuselage, integrate all electronic components, take care of the finish and adjustments - and finally fly.

Shopping list addition to the milled parts

(Included in the material and milling parts set)

6 × pine slat 10×3 mm (incl. surface struts)
12 × pine strip 5×3 mm
2 × balsa triangular strip 6×6 mm
3 × balsa strip 12×6 mm
2 × balsa strip 5×3 mm
3 × balsa strip 6×6 mm
Balsa board 3 mm
7 × balsa board 2 mm
2 × end strip 6×35 mm
Steel 6 mm (240 mm long) + matching brass tube (120 mm long)
Steel 4 mm (240 mm long) + matching brass tube (120 mm long)
Steel 4 mm (210 mm long) as wheel axle

Wirbelwind EDF

Wingspan:	2.050 mm
Length:	1.200 mm
Carcass weight:	approx. 950 g
Flight weight:	1,650 to 2,000 g (depending on drive)
EDF-drive:	69-mm-EDF
Drive train:	e.g. Hacker A30 10 L
Battery:	3s- bis 4s-LiPo mit 2.400 bis 4.300 mAh
Profile:	SD 7037 mod.
RC functions:	rudder, elevator, ailerons, motor
Servos:	Hitec HS 125 MG on aileron, Savöx SH 225 MG on elevator/ page
Receiver:	Jeti Rex 7

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You can find the flight video for the article at:
www.fmt-rc.de

Wirbelwind EDF, Part 2

The Whirlwind is a very special motor glider: actually a good-natured guy, but one who can really hiss. In the last issue we presented its unusual construction, discussed the drive layout and started building the wing.
Now it's time to move on!

HISSING MOTOR GLIDER

Tails and tail boom

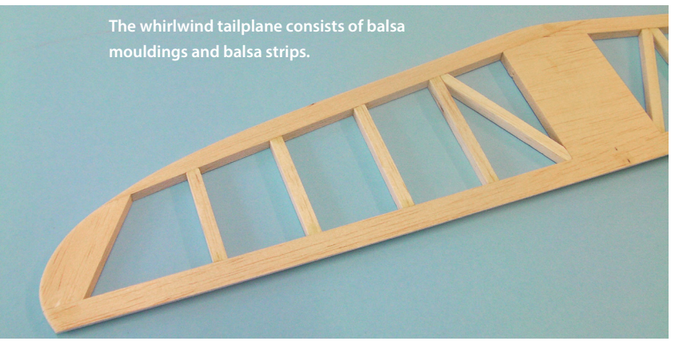
The tailplane is assembled from moulded balsa parts and webs of balsa strips. The two halves of the elevator are joined with pine strips and additionally reinforced with fabric. The fabric holds very well even with thin super glue. The elevator is attached to the tailplane with iron-on foil - this should be done before gluing it into the fuselage. The rudder, on the other hand, I ironed ready and attached with hinges afterwards.

To the tail boom: First the two rear struts are built up. Cut the strut longitudinal members 28 to length according to the plan. It is best to leave the side at the tail unit 5 to 10 mm longer so that you can make some adjustments later. The planking 29 with grain is cut lengthwise and applied with plenty of glue. The strength is absolutely sufficient, the weight is about 50 g uncovered.

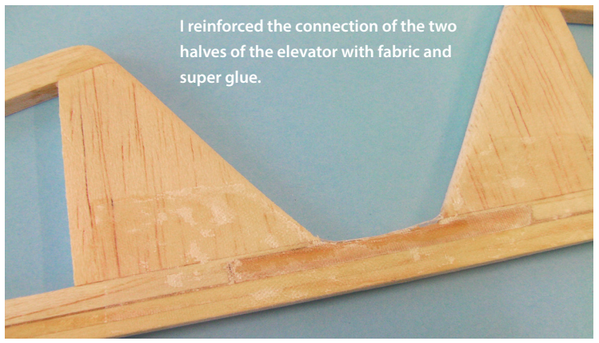
The front fuselage

Cut the planking for the tail boom 15 from 2 mm balsa. Place the two struts exactly according to the plan on the planking and glue them together with the tail boom. Cut a cut-out in the strut joist for the servo cables. The servo screw area can be reinforced with thin plywood.

Now the servo cables can be easily pulled in and you can check if the cut-outs fit. The next step is to attach the second tail boom and the upper planking. The servos should now also be arranged on a trial basis.



The whirlwind tailplane consists of balsa mouldings and balsa strips.



I reinforced the connection of the two halves of the elevator with fabric and super glue.

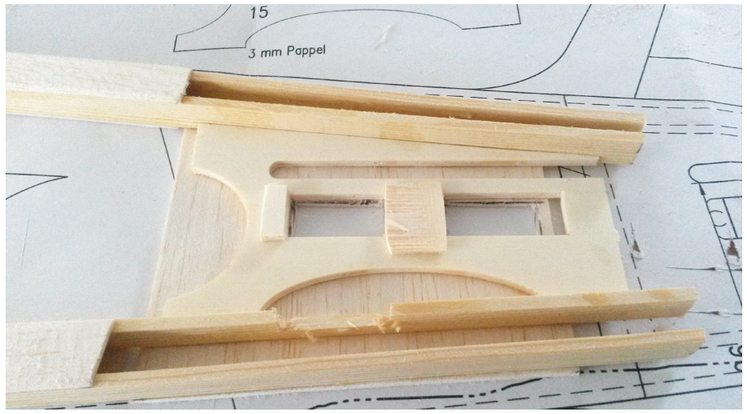
The rudder is hinged. Then it can be covered and finally mounted.

The side panels 8 are now test-fitted to the frames and it is also checked whether the fuselage straps fit into the cut-outs. Then glue the side panels to formers 4, 5 and 6, for this the formers with the support feet are on the plan view. The fuselage straps 26 and 27 are inserted and glued together with formers 3 and 2. The lower side panels 18 are then glued in place; the fuselage chords provide a good gluing surface and strength. You can now check the tenon of the tailplane frames 8a and 8b with the half frames 7a and 7b and then glue them into the fuselage.

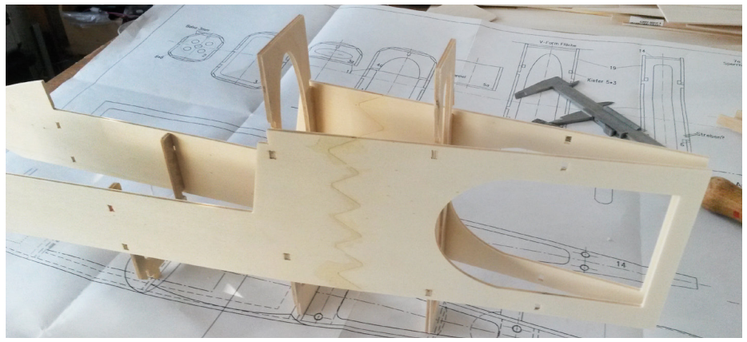
Connection to the tail struts

Then connect the front part of the fuselage to the tail unit struts. To do this, align the fuselage exactly on the plan view and fix it with weights, the support feet of the frames ensure the correct horizontal position.

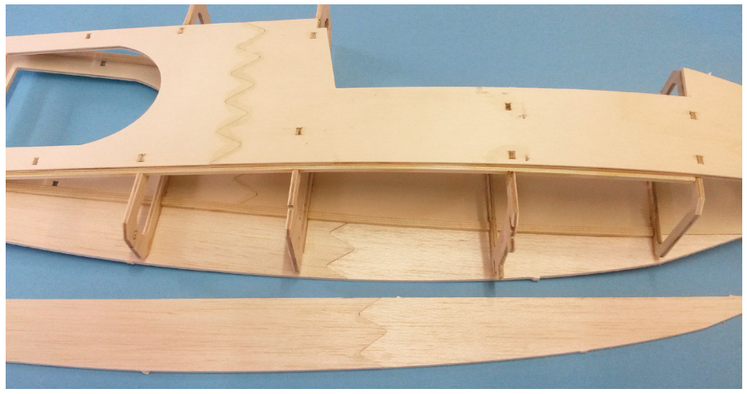
Now slide the strut and tail unit into the slots in formers 8a and 8b. Support the rear at the correct height by measuring the height at the front and rear tail support. I used a small vice to hold it in place. Align it lengthwise and check the correct angle. Fix it with glue, check it again and glue it well. If you don't have a vice, you can also clamp two angles together with a screw clamp and adjust the height with supports. You can also use Lego blocks to put together a suitable mount. If the height of the tailplane and thus the angle of attack are not exactly right, this is not a problem. Because the wing is only screwed on, you can still correct the difference in angle of attack by placing the wing underneath at the front or rear.



The two struts are glued to the planking together with the tail boom. The cut-out in the pine strip is used to feed the cables through.



Side panels and frames are glued together standing on the plan.



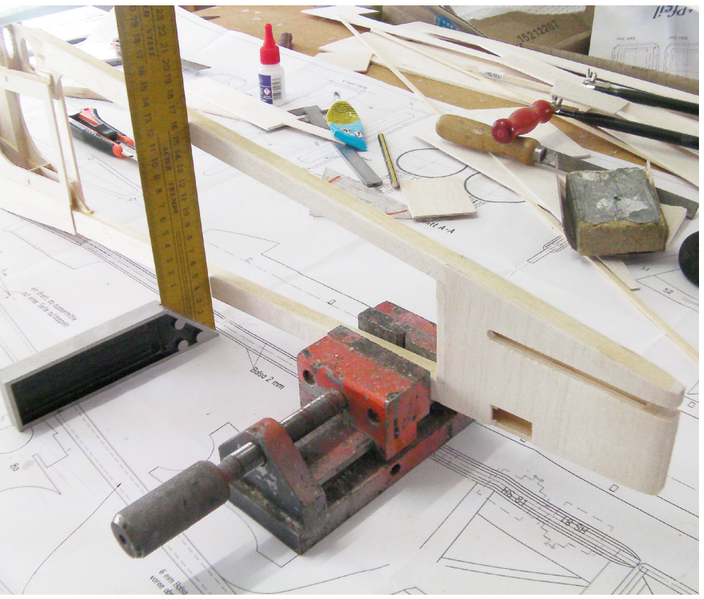
The fuselage straps provide a large gluing surface for the lower balsa side panels.

Before attaching the upper fuselage side panels 19, glue on the wing support 14, followed by the threaded boards 9 and 10.

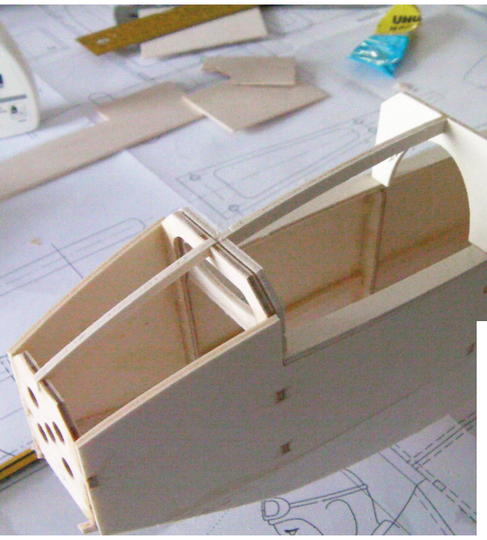
Canopy and undercarriage

To ensure that the canopy fits well, it is built directly onto the fuselage. And this is how you proceed: The canopy frame 11 is glued to formers 3a and 4a and the canopy belt 13.

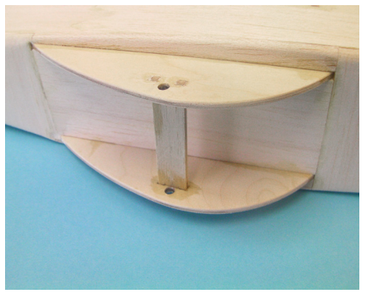
The tailplane frames 8a and 8b are mortised to the half frames 7a and 7b, the tailplane struts go into the slots.



This is how I align the tail boom at the correct height and angle.



The canopy is mounted on the fuselage, the straps 12 and 13 ensure the correct bending of the planking.



The side parts are connected to the strut; this facilitates assembly and increases strength.

Frame 5 and the side panels 21 complete the canopy. The upper slope of the fuselage and the canopy are sanded according to the plan and covered with 3 mm balsa.

For the undercarriage: Put the undercarriage parts 16 together with the strut 17 and into the recesses of the fuselage frames. The 4 mm undercarriage steel is also inserted, this helps with the alignment.

The fuselage can now be placed on the landing gear parts and aligned. Make sure that the fuselage is not at an angle and that the track of the landing gear is correct. I first glued one side part, checked everything again and then glued the second side. After that, the underside of the fuselage can be planked. If you don't want to do a ground take-off, you can leave out the landing gear and land on the fuselage or attach a skid.

EDF installation

First try installing the EDF without camber and side pull and pull in the extension of the EDF cables. The cables should be long enough so that you can solder on the governor or use connectors later.

Attach the 2 mm balsa planking in front of the EDF and cut an opening in it (see plan) to lead additional air to the EDF. The gap between the EDF and the fuselage is covered with thin balsa; for this purpose, the nozzle is also mounted on a trial basis. On one side I glued the gap cover, on the other side I ironed it on after installing the EDF or fixed it with a little glue. This way you can remove the EDF again on the finished model or correct the position.

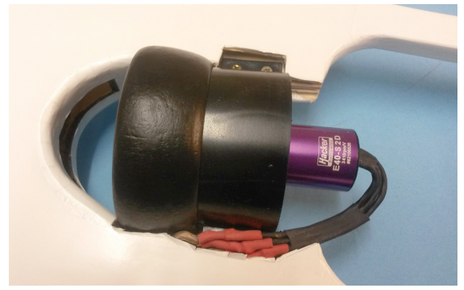
Align wing

The holes for the screws in the wing can now be pre-drilled with 2 to 3 mm, then place the wing on the fuselage and align it. Then drill the holes through the wing and the threaded board.

Then drill the holes in the surface to 6 mm - and the holes in the threaded boards to 4 to 5 mm. Then cut an M6 thread, harden it with thin super glue, let it dry well and cut again.

The rudder can now be aligned and glued in place with the wing in place; you should reinforce the transition with triangular strips, likewise for the tailplane and the tailplane. I first ironed the tailplane and then glued it in place.

The extension of the EDF cables is now retracted; the gap cover is glued on one side. The fuselage planking in front of the EDF has an additional air opening.



Here you can see the assembled EDF with inlet lip, but still without the nozzle.

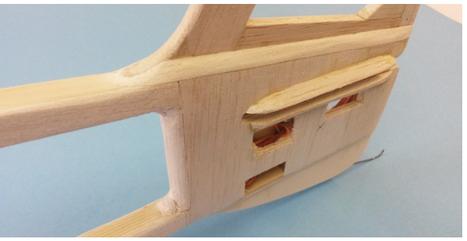
Grinding and stringing

The complete carcass is sanded. Before covering it, you must dust it off well, otherwise the foil will not hold properly. The best way to finish is to rub the components with an old black T-shirt. It is amazing how long you can see white dust on it; this dust prevents the film from sticking to the wood and leads to wrinkles. When covering with Oracover, the rudders are ironed on at the same time. I used the following Oracover iron-on film: Matt white, art.no. 34-010-002 and Matt Ferrari red, art.no. 34-023-002. I also covered the wooden wheels. However, I used normal hinges for the rudder, this is easier here and the rudder can be removed later if necessary.

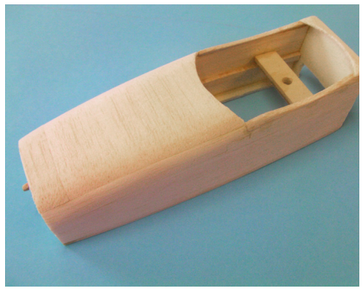
I painted the undercarriage parts black. The undercarriage wire and the wheels are fixed with adjusting rings. Since the servos are installed in the tail unit, the rudder linkages are short and direct. The EDF is mounted after stringing with four wood screws. I attached the nozzle to the EDF with small screws. If the camber or side draught should not be right when flying in, you can still correct the air jet. However, the Whirlwind is completely unproblematic in this respect, as the EDF sits almost in the center of the model.

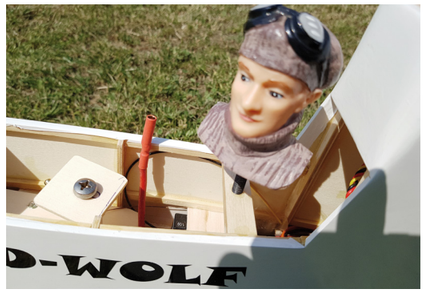
Settings for the first flight

With the given center of gravity and the EWD of about 1° you get good glide performance and a relatively neutral behaviour even at full throttle. If you mainly want to do slow gliding, you can lower the center of gravity a little or increase the EWD by trimming up or underlaying the wing at the front. 3 mm around the front thread board results in an increase of about 0.7°. Of course, you can also programme flight phases. By the way, after a complete season I am still flying with the information given in the plan.



The transitions of rudder and tailplane are modelled and reinforced with triangular strips. For the tailplane, the steel wire is glued between the two poplar parts.





The finished canopy. A dowel is used to fix it in place at the front and a threaded rod made of an M6 plastic screw glued into the pilot at the back.

▲ Of course it also works: fellow author Tim Kleinschmidt has built a skid version of the whirlwind.

◀ The attachment of the landing gear with adjusting rings. The wing struts are clamped to the fuselage with a moulding and a screw..

As rudder deflections I recommend for the first flight: Elevator 25 mm up and down, aileron 25 mm up and 17 mm down, rudder on both sides with 25 mm. Depending on your flying style, you can of course increase the deflections considerably later and adjust them softly with Expo.

Milled parts and material set

The quickest way to build the Wirbelwind is with our routed parts set or the material and routed parts set:

- The **milling parts set** includes all components such as ribs and frames made of balsa and plywood in selected quality. Planking material and some battens are still needed. Art.No.: 621 1801, Price: 164,95 €.

- In addition to the **milled parts, the material and milled parts set** also includes the planking timbers, battens, the plug-in, the wheel axle. Art.No.: 621 1802, Price: 199,95 €.

VTH-Order-Service: Tel.: 07221 5087-22, E-Mail: service@vth.de, Internet: http://shop.vth.de

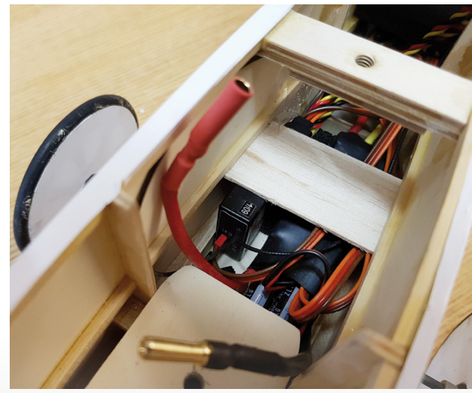
The two Savöx SH 225 MG are installed directly in the tailplane; this results in short, direct rudder linkages.

Flying with the whirlwind

As the lawn was still unmown during the first flight, I threw the Whirlwind at first. As expected, the model, equipped with the 3s EDF drive, pulled away in a powerful climb. At some height the EDF was switched off and the Whirlwind glided on comfortably without corrections.

In the meantime, I have tested the model extensively with both EDF variants. With 3s, a ground take-off on grass is already possible, the large wheels also contribute to this. The 3s drive is sufficient for a good climb, rolls are well flyable despite the high-wing design. Turns are very nice, and if you let the EDF run a little, you can also fly it very crisply by blowing directly on it. The rudder generally works very well, turns can be flown with side only. Even on the ground, the whirlwind can be steered well without a steerable tail. Even inverted flight is possible, but you must use aileron to prevent the model from turning further. The low center of gravity makes the model extremely docile. Only by using all rudders with large deflections is it possible to fly a torn roll.

The whirlwind is very good in gliding flight and due to the neutral EDF position no re-trimming between power and gliding flight is necessary. The model can be made nice and slow, so landing is also no problem and usually succeeds without hops. The flight performance with the propeller version should be the same, but I have not tested it. The EDF sound is just too beautiful...



Receiver and ESC are arranged next to each other on the bottom of the fuselage. They are fixed from above with a balsa board, which is simply clamped under the longitudinal straps of the fuselage.

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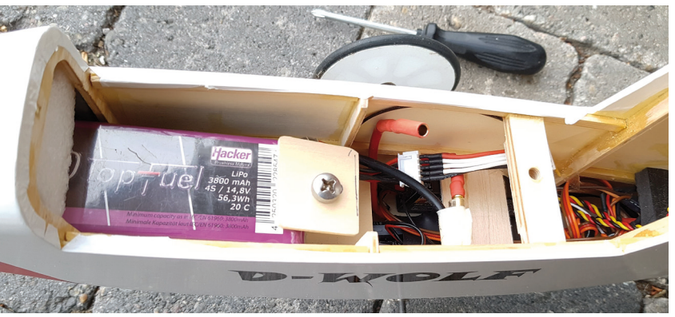
Due to the stable flight behaviour and the rear-mounted drive, the Whirlwind would also be well suited as a camera carrier.



The flight battery (here the 4s LiPo) is pushed into the fuselage and positioned at the front by a piece of foam. It is then clamped in the rear by means of a screw and a small plywood board.

Wild also works!

The 4s EDF version has a lot more power. The thrust/weight ratio here almost corresponds to a jet replica. Ground take-offs are then no problem with barely 10 m taxiing distance and climbs with more than 45°. If you pick up some speed, even a vertical roll is possible. The noise at full throttle is really jet-like and huge loops are a real show. Thanks to the high fuselage, the model can be tilted nicely and even something like knife-edge flying is possible. Despite the high fuselage, I could not observe any particular sensitivity to wind.

Rushing cruising

The whirlwind is already causing a stir on the ground because of its unusual construction. The comment of FMT author Werner Baumeister: „You really put an EDF everywhere...“. Slow, low overflights are particularly beautiful with the Whirlwind. With quiet noise and the beautiful, old-timer-like flight pattern. Leisurely cruising, relaxed soaring in the thermals and even wild acrobatics with great sound - all this is combined here in an unusual aircraft. That's how I imagined it.

Wirbelwind EDF

Wingspan:	2.050 mm
Length:	1.200 mm
Carcass weight:	approx. 950 g
Flight weight:	1,650 to 2,000 g (depending on drive)
EDF-drive:	69-mm-EDF
Drive train:	e.g. Hacker A30 10 L
Battery:	3s- bis 4s-LiPo mit 2.400 bis 4.300 mAh
Profile:	SD 7037 mod.
RC functions:	rudder, elevator, ailerons, motor
Servos:	Hitec HS 125 MG on aileron, Savöx SH 225 MG on elevator/ page
Receiver:	Jeti Rex 7