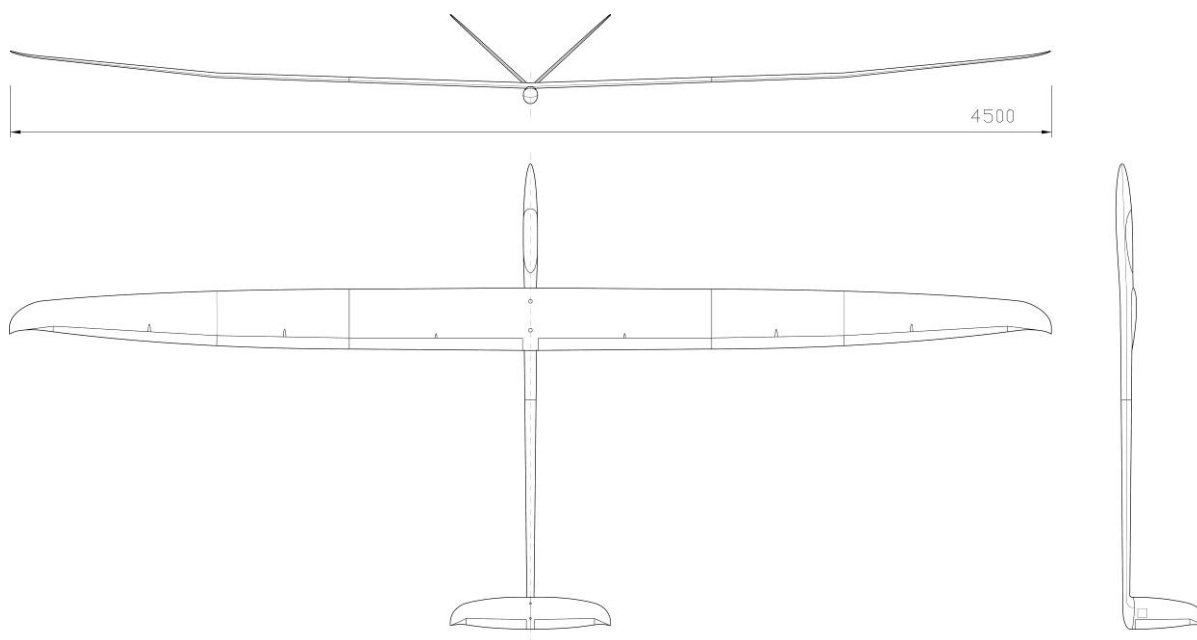


Wing span [mm]:	4500
Aspect ratio:	20
Wing area [dm ²]:	101,18
Wing loading:	52-83
Weight [g]:	5300-8400
Airfoil:	VS1



BUILDING INSTRUCTION

ELVIRA

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VOR DEM FLUG

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DATEN

1. Kit – Contents

Fuselage, in two parts
Wing, in three parts
V-Tail

Carbon-connector, 2 pieces
Steel-connector, short, 4 pieces
Steel-connector, long, on demand

Covers for servos in wing, 6 pieces
Covers for servos in V-tail, 2 pieces

radio board (for fuselage)
Cables + plugs
Lock for canopy
Levers for rudders, 6 pieces
Steel wire
Connectors for push rods, M2,5mm, 12 pieces
Welding rod, d=2mm

Screws, 2 pieces, for fixing the wing
Screws, 2 pieces, for fixing the v-tail

2. What else do you need:

On-off switch / socket for loading

Epoxy-glue (for example UHU 300 endfest or Stabilit, no
fast hardening epoxy resin)
Cotton flocks to thicken glue

3. Electronical equipment

Servos wing: Futaba
S3150

Servos V-tail: Hyperion DS09AMD

Außerdem passen:
Robbe
S3108
Graupner
C2081

Receiver:	Every size will fit.
Accumulators:	We recommend double power supply with 5 cells each. f.e. Eneloop 2000
Suggestions for electric drive:	<p>Version 1: Kira 600-20 + gearbox 6,7:1 Controller: 60A Propeller: 18.5/12 Spinner: d=42mm Accu: 2x 3S 4000 mA/h 45C (Planet Hobby, Modellbau Lindinger) Package size: 2x 135/43/24mm or 1x 135/43/48mm ETA: 92,1% at 5kg thrust</p> <p>Version 2: Hacker A40-10L-14p-V2 (outrunning brushless engine without gearbox, fits very tight, cables must be lead outside, pay attention on cooling) Controller: 70A Propeller: 13/8 Spinner: d=42mm Accu: 2x 3S 4000 mA/h 45C (Planet Hobby, Modellbau Lindinger) Package size: 2x 135/43/24mm or 1x 135/43/48mm ETA: 89,1% at 5kg thrust</p>

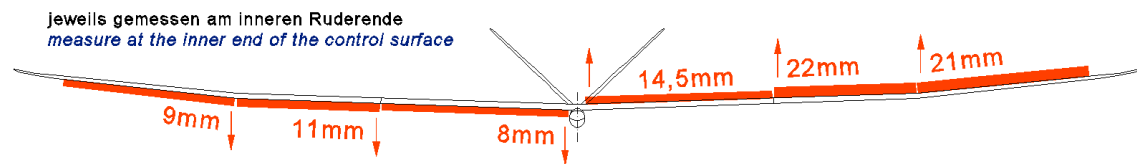
4. Settings for the first flight

Centre of gravity: 100mm

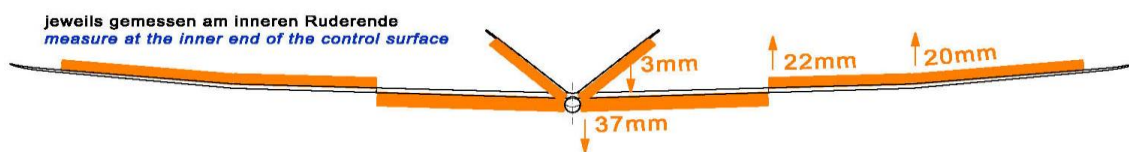
Difference in angle of attack: $+1,92^\circ$ (flaps 0)

(measure from the leading edge of the wing to the back)

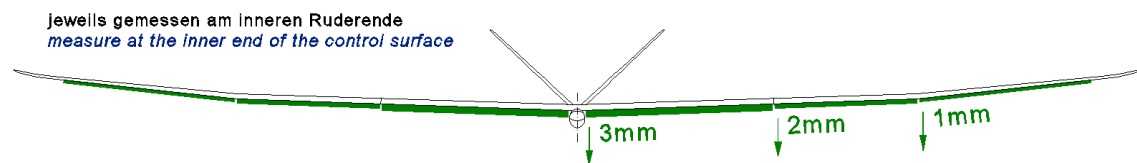
Ailerons and flaps



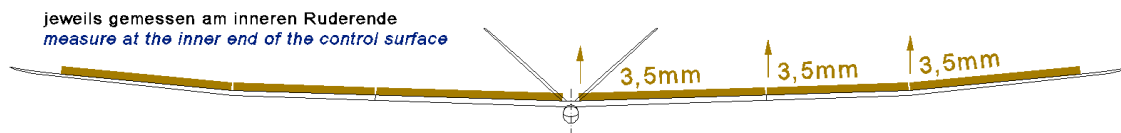
Butterfly (landing position)



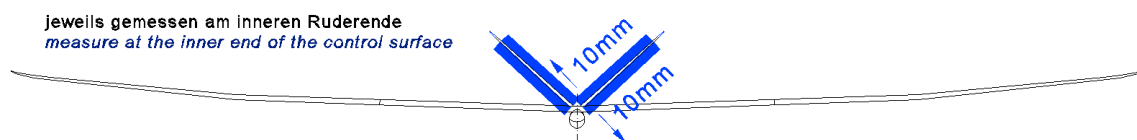
Flaps positive



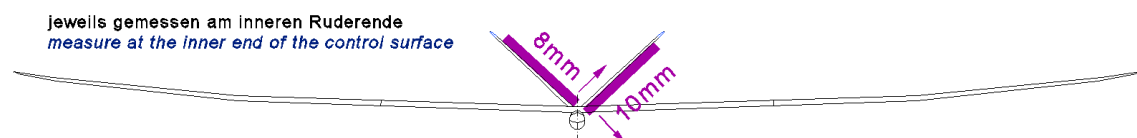
Flaps negative



Elevator



Rudder

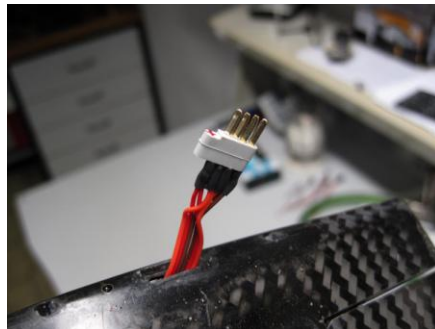
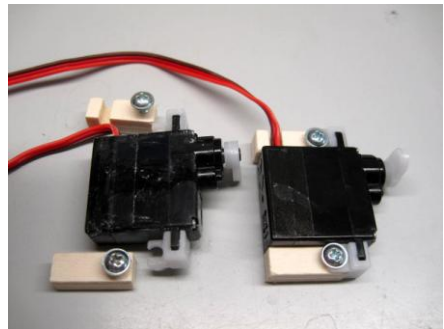
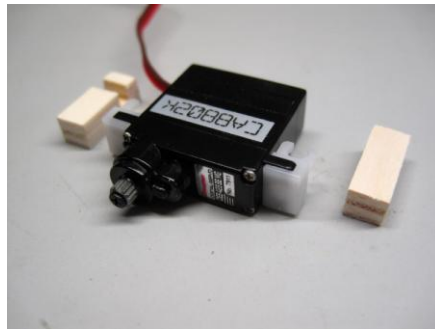


ASSEMBLING THE MODEL

5. V-tail

The v-tail is ready prepared with holes for screws to be fixed on the fuselage.

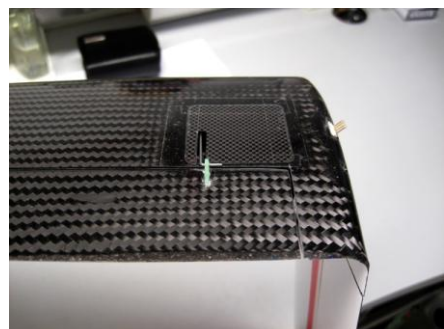
Install the **servos** for controlling elevator and rudder **in the V-tail**.



Glue the 2 parts of the **connection plug** into the deepenings prepared in the V-tail and the fuselage.

For the connection to the control surfaces use the **lever enclosed** and a **steel wire**.

Höhenruder
elevator



Fix the **covers of the servos** with **adhesive**. You still have to cut the cover where the lever of the servo pushes through.

6. Fuselage

Front and rear part fit together very tight. So the important parameters, such as the **difference in angle of attack** and the **alignment** around the axis of the fuselage, are **automatically adjusted** correctly.

Nevertheless, before you glue the 2 parts together, you can check the alignment of the V-tail regarding the axis of the fuselage, so that it is fixed symmetrically.

To do this, mount v-tail and wing on the fuselage. Look at Elvira from the front and slowly lower the tail, until the ends of the elevator disappear behind the wing.

If both ends of the elevator disappear at the same time, the v-tail is aligned correctly.

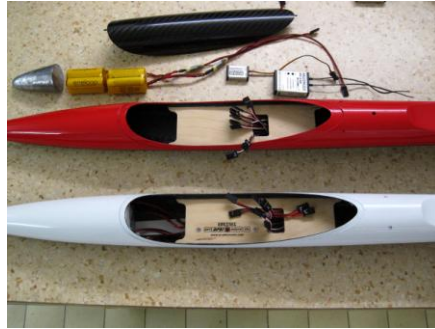
(You see it here with the example of Erwin – 2 meter.)

Then glue the parts together. Use epoxy-glue and some cotton flocks to thicken the glue. Before you do so, sand the gluing spots thoroughly.



7. Installation of electronical components for the glider Version.

Suggestion



If you want to install **2,4GHz**, lead the antennas outside the fuselage **behind the canopy**. You can lead them f.e. both on one side ...



.... or both on top of the fuselage. Note that the **angle between the antennas** should be **90°**.



Always **test the reception** on ground before you fly!

We use a very simple solution to mount the canopy. Just glue the carbon stick into the canopy.

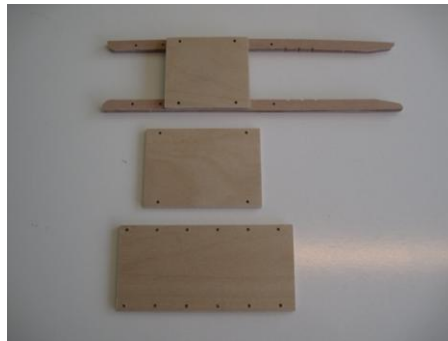


8. Electric drive

Suggestion

In the kit you find wood parts which you can see in the first picture. These are the mountings for the cells and also strengthening for the fuselage. We deliver three boards to strengthen the fuselage depending on the cell size you use. If you use a 6S 4000mA/h it is not possible to screw into one of these strengthening anymore.

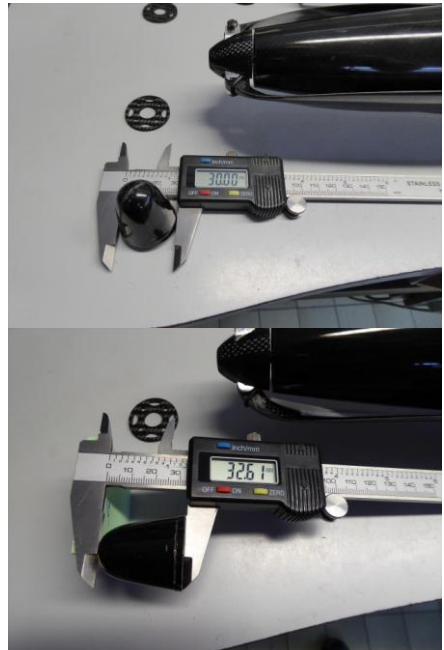
Bend the 1,2mm steel (pic. 2) and connect it to the cells by a simple tape. Then drill holes at the position you need for the right CG into the sides of the long wood parts. Test the positions of all parts before gluing.



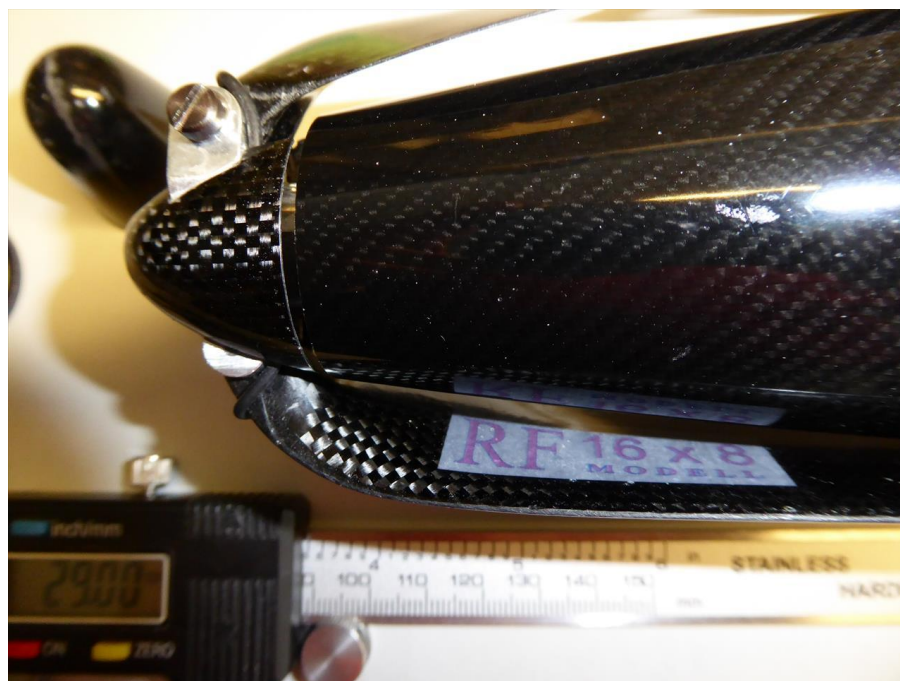
Here you see the very simple and effective mounting of the cells. Then screw one of the boards on the long wood parts to strengthen the fuselage.



Here we installed an Kira 480+ gear. So we were able to use a 30mm spinner. You get a 30mm hole when you cut the nose at 32,6mm measured from the front.



2° down
1° to the right
 You can add
 deflection of
 elevator depending
 on the engine

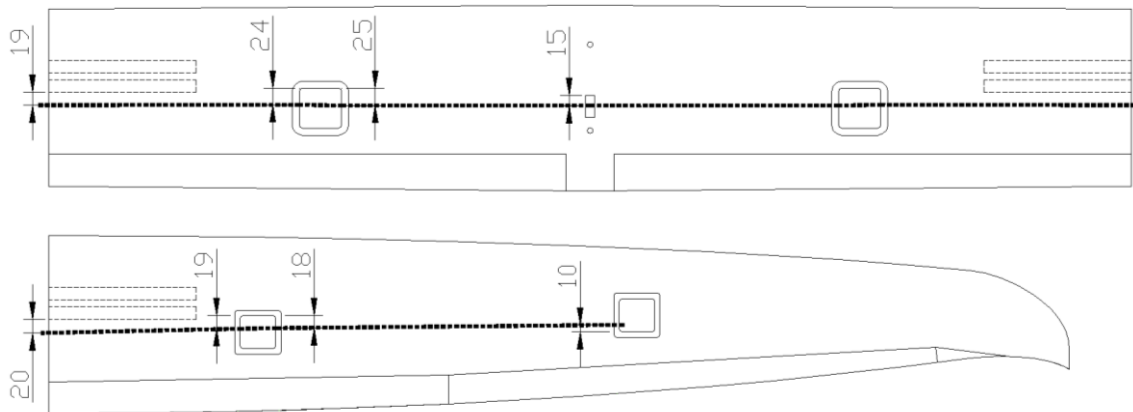


9. Wing

The openings for the servos are big enough for all appropriate **standard servos** including mounting frame, such as Futaba S3150.



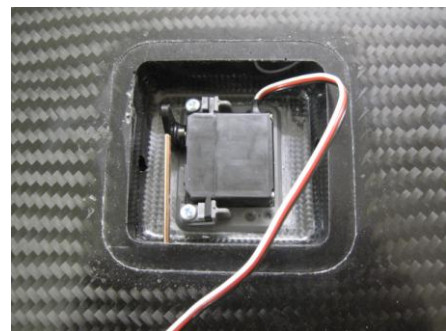
Lead the **cable through the wing** as shown below.



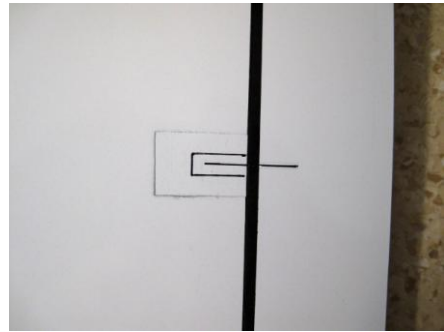
The connection to the levers on the rudder goes **crosswise through the wing**.



Glue the **installation frames** of the servos into the deepenings in the wing.



Cut slits in wing and control surface of the **middle part** of the wing.



Before you glue the levers into flaps and ailerons, **grind the gluing spots** on the control surfaces and on the levers.

Querruder aussen
outer aileron



Querruder innen
inner aileron

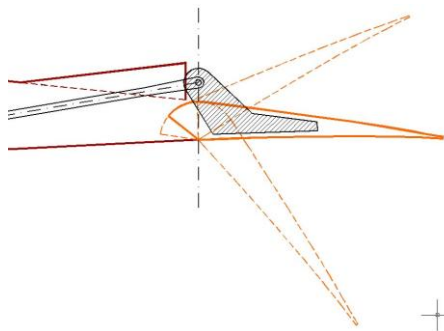


Wölbklappe
flap



For gluing the lever use **epoxy-glue** with cotton flocks.

When fitting the lever in the correct position, notice that the **hole** in the lever should be situated **vertically above the hinge line**.

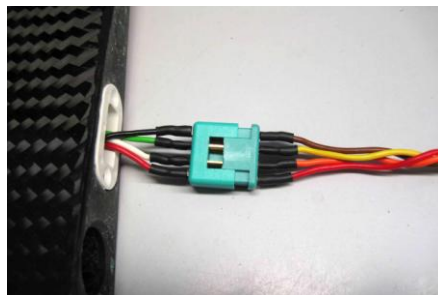


To **connect the servos to the levers** use two **connectors M2,5mm**. In between, use a **welding rod** (diameter 2mm), which you solder inside the both connectors.

To find the right length of the welding rod put all servos in 0-position. If the length isn't exact after soldering, you can heat the soldered point with the soldering iron until the the wire can be moved to the correct position.

There are several **recesses for the plugs** for easy electrical connection between the different parts.

Outer wing –
middle wing part



middle wing part
- fuselage



Fix the **covers of the servos** with a double-sided adhesive.



In order to **move the triangular ends** of the ailerons, you can bend a piece of steel wire (0,8mm or thinner) and glue it into the end of the aileron as shown. Let the wire jut out about 6mm.

You can also fix a piece of steel wire to the trailing end of both control surfaces with adhesive tape. Let the wire be movable inside the tape on one control surface.

If you want an easier solution, connect the two control surfaces with an adhesive tape.



BEFORE THE FIRST FLIGHT

10. Ballast system

You can easily **change the weight** by varying between the **different connectors**.

When the conditions are weak, you could also fly with just one carbon rod on each side. But please be aware not to put too high forces to the wing.

If the glider accelerates too slowly, don't hesitate to add further weight. Elvira can do well with more weight, in the air as well as when landing.

(Pictures taken from Erwin XL)

1x carbon short, 1x steel short, 900g



1x steel short, 1x steel long, 2250g
(Steel long is not included in standard kit. Order an additional steel bar if you need it.)



2x steel long, 3000g
(Steel long is not included in standard kit. Order an additional steel bar if you need it.)



11. Fixing of the wing

When attaching the wings, put the **longer end** of the connector **into the middle wing** part.

Close the gap between the wing parts with **adhesive tape**.
By this way, the wing parts are fixed to each other.



12. Check list before starting:

1. Check **centre of gravity** (the angle of attack is pre-set)
2. Check **rudders**:
 - Do rudders move in the correct direction?
 - Check the greatest swings of the rudders
 - All control surfaces are continuously connected to the wing along the hinge line.
3. Check **reception**
 - 2,4 Ghz: depending on radio controller (f.e. reduce transmission power)

13. Attention, ErwinXL is sensitive to heat!

Pay attention, that **Elvira does not heat up!** That means,

- don't let the model lie in the car, when the sun is heating up the car.
- don't let the model lie in the sun too long. Protect wing and elevator with bags, if you don't fly.
- Avoid all other possibilities to heat up Elvira.

The model is heated up to 50° during production, but in the sun the model can easily reach higher temperatures. During flight the model is sufficiently cooled by the airstream.

This sensitiveness is high shortly after production / purchase and will get less gradually.