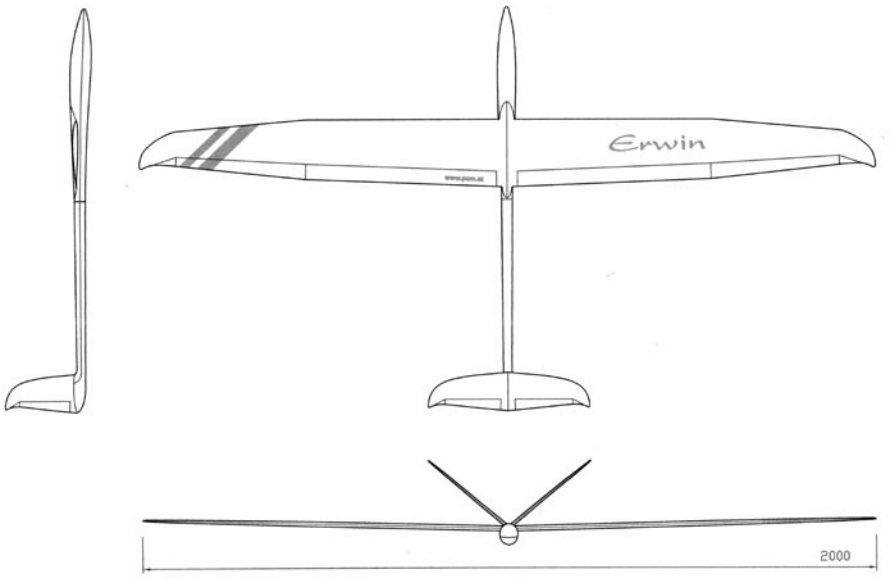
Technical data:	Wing span [mm]:	2045
	Weight [g]:	1300-1600
	Wing loading [g/dm^2]:	44,0-54,2
	Airfoill:	HQW/1,5/7mod-gestrakt
	Aspect ratio:	13,54
	Controls:	H/S/Q/W
Construction:	Fuselage	CFR/GFR strengthened with carbon rovings
	Wing / V-tail	CFR/GFR–shell-construction without support material spar made of CFR-rovings and GFR-hoses



BUILDING INSTRUCTION
ERWIN

CONTENTS

DATA

1. Kit – contents

Kit with kitparts:

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

Covers for servos on wing, 4 pieces
Push rods, aluminium, for the elevator
Supporting frame, balsa, for push rods
Ball connectors for the elevator
Levers for rudders, 4 pieces
Servoboard
Fixing board for servoboard
Screws for fixing the V-tail, 2 pieces
Adhesive decoration film (just with unpainted models)

Connectors / Ballast:

	Segler / Glider
Normal (Slope)	1x Kohlestab / *carbon rod* 2x Stahl / *steel*

Building instruction for download on our homepage

2. What else do you need:

Tape, f.e. Tesa
Epoxy-glue (for example UHU 300 endfest or Stabilit, no fast hardening epoxy resin)

Controls of the wing:
Connectors for push rods, M2,5mm, 8 pieces
Welding rod, d=2mm

On/Off-switch / socket for loading cables
Cable for antenna, possibly steel wire for extension of antenna
Plugs

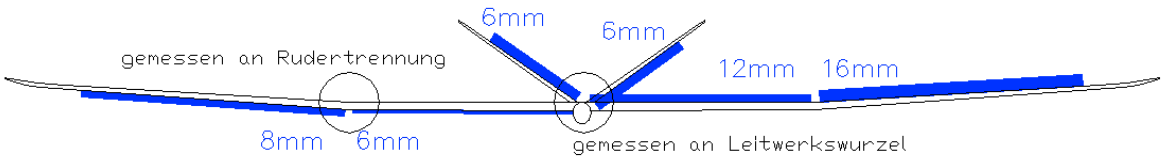
3. Electronical equipment

Servos for the wing:	Graupner DES428
Servos for the V-tail:	Graupner C261
Receiver:	2,4 GHz receivers should have long antennas
Accumulators:	Eneloop 4,8V 2000mAh

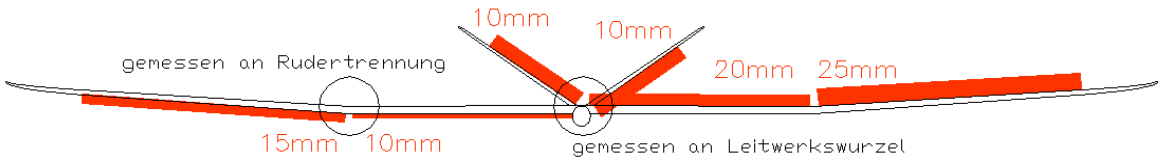
4. Settings for the first flight

Centre of gravity: 61-64mm
(measure from the leading edge of the wing to the back)

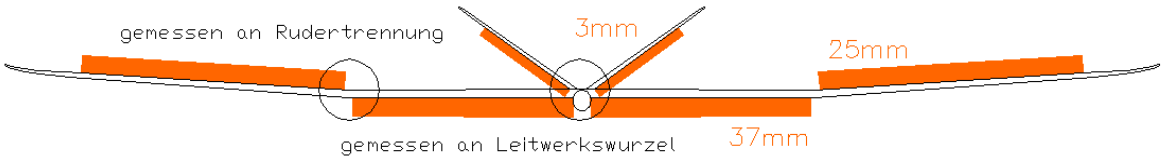
Ailerons and flaps (soft)
(measure between aileron and flap and on deepest point of the elevator)



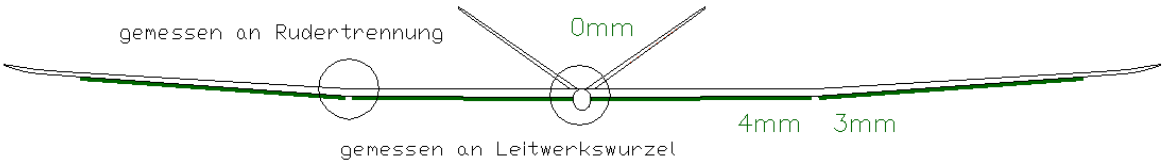
Ailerons and flaps (strong / dual rate)
(measure between aileron and flap and on deepest point of the elevator)



Butterfly (landing position)
(measure between aileron and flap and on deepest point of the elevator)

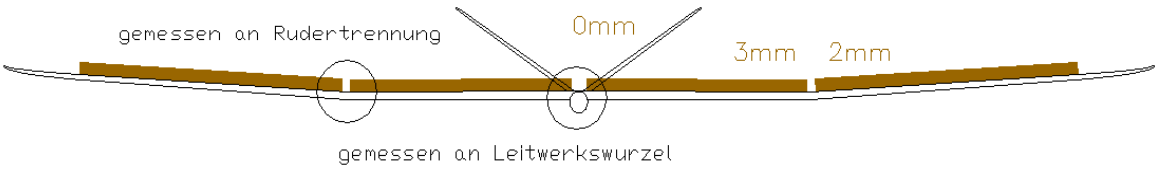


Flaps positive
(measure between aileron and flap and on deepest point of the elevator)



(You can possibly trim the elevator during flight.)

Flaps negative
(measure between aileron and flap and on deepest point of the elevator)



(You can possibly trim the elevator during flight.)

If you use 50% Expo (switchable) you can fly in soft conditions („ailerons and flaps – soft“)
With 60% dual rate Erwin flies calm and elegant.
You should be able to switch the flaps to the ailerons: When thermaling you should use only ailerons, when doing aerobatics Erwin flies best with flaps and ailerons together.
For nice rolls switch off differential (controls should make the same way in both directions, up and down).

ASSEMBLING THE MODEL

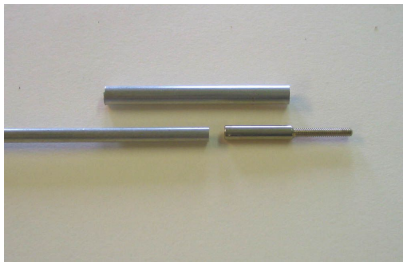
5. V-tail

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

Controlling of the elevator:

Bend two levers of aluminium or brass as shown below and glue the ball connectors to one end each. Then glue the levers to the control surfaces of the elevator. The gluing spot should be as near as possible to the turning axis of the controls (silicone hinge).

Scale 1:1



The other part of the connector must be fixed to the aluminium pushrod. Move the shorter piece of aluminium over the pushrod on one side and the thread rod on the other side. Fix the joints with super glue.

Ready mounted levers with ball connectors.

6. Fuselage

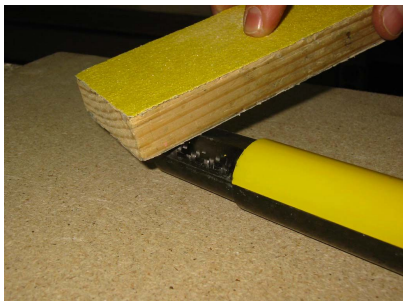
Before you glue the two parts of the fuselage to each other, you have to fix the balsa-frame, which supports the aluminium rods for the elevator, into the rear part of the fuselage. The easiest way to do so, is to push the balsa part with a rod backward as shown besides.

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 Erwin from the front and slowly lower the tail, until the ends of the elevator disappear behind the wing.

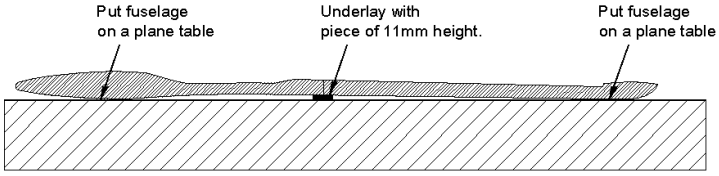
If both ends of the elevator disappear at the same time, the V-tail is aligned correctly.

If the V-tail isn't aligned correctly, chamfer the edges of the fitting. Put the two parts of the fuselage together again and turn one part until the V-tail is mounted symmetrically.



Additionally, check the difference between the aerodynamic angles of wing and elevator (0,5°):

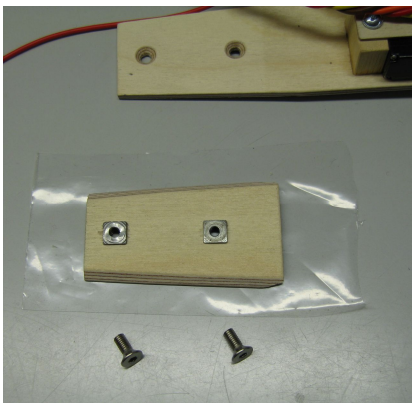
Underlay the fuselage with 11mm at the point where you put the rear and the front part together. If you can't adjust the parts in this way, you'll have to grind at the connecting spot of the fuselage until it fits correctly.



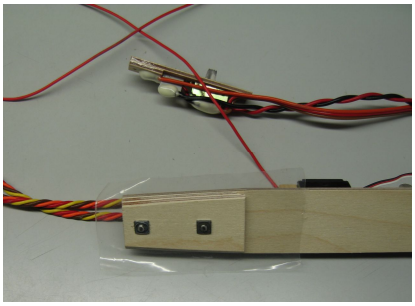
If everything fits, glue the parts together in this position. Use epoxy-glue and some cotton flocks to thicken the glue.

7. Installation of electronical components

First you have to glue the fixing board inside the fuselage, as the servoboard is fixed to this board.

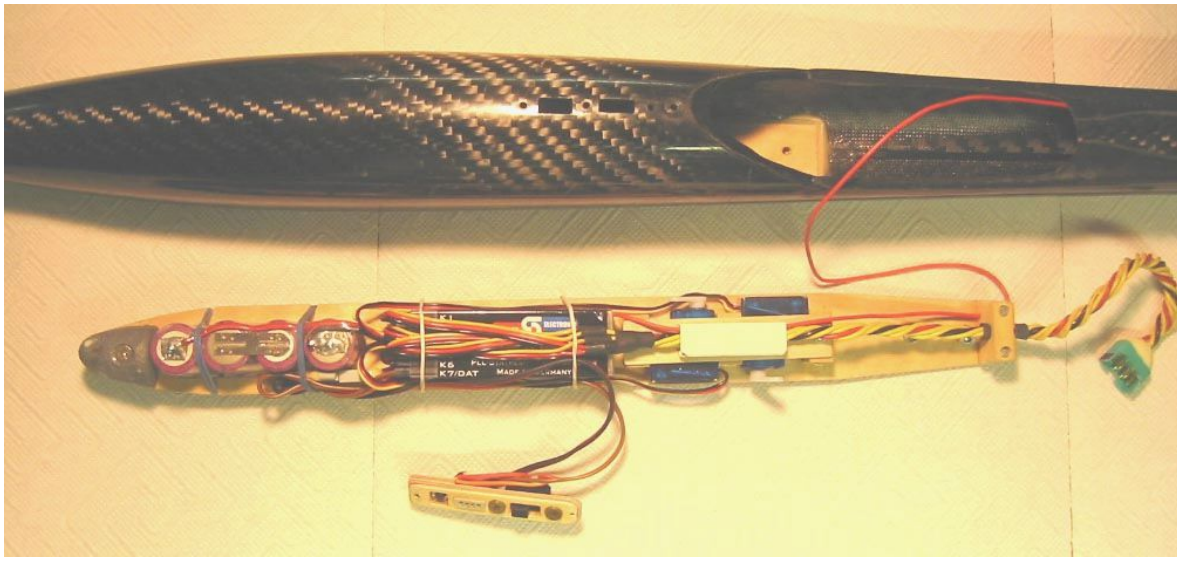


Drill one or two congruent holes in both boards and knock a nut into the hole of the fixing board. Mount the servoboard to the fixingboard with screws and enclose a foil between the boards.

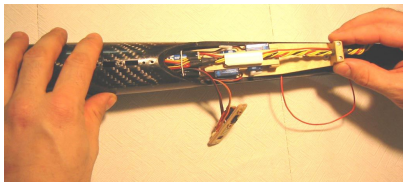


For gluing grind the joins and put epoxy-glue on them. Then push both boards into the fuselage (servoboard in front) as far as they will go.

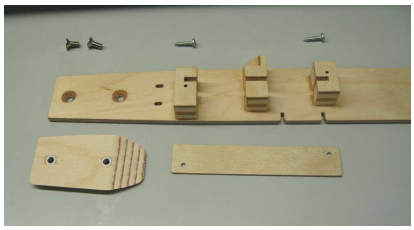
Suggestion for the installation on the servo board:

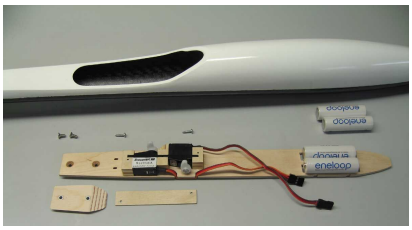


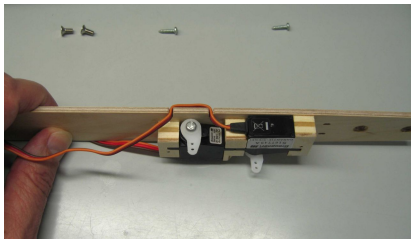
Mount everything on the board and then thread it inside the fuselage.

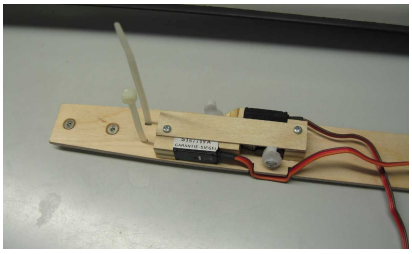


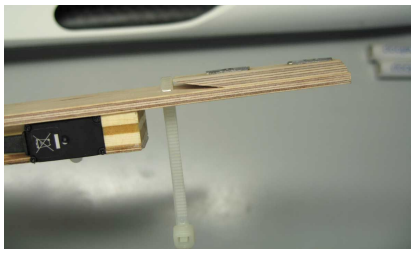
Here is an example how the electronic equipment can be placed on the servoboard.



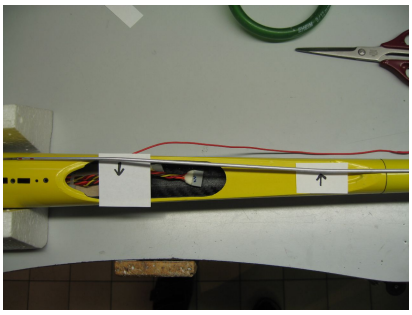


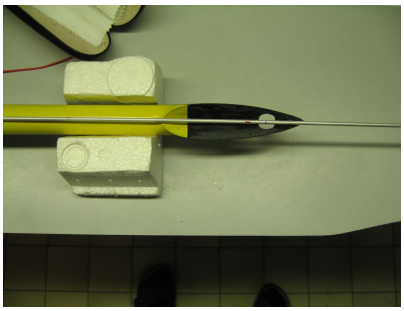






To make the aluminium pushrods move easier, you can bend the rods slightly according to the outline of the fuselage. By this way you will also gain some space on the servoboard.



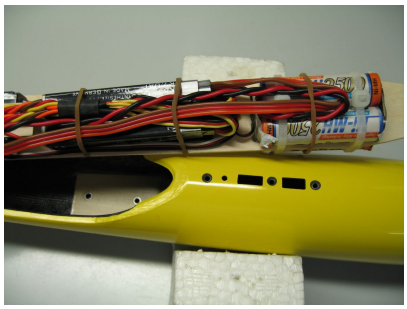


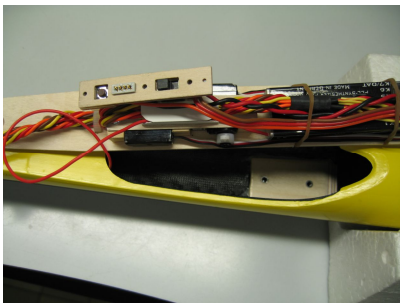
As the wing possibly loosens in case of a crash, there will be tension on the cable. To avoid this, we recommend to clamp the cables to the radio board with a block of wood. In this way the plug can be loosened without putting tension and possibly causing damage to the electronic parts.

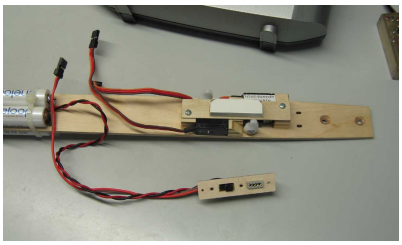
The receiver should be situated close to the opening in the fuselage. In this way, you can change the frequency easily.

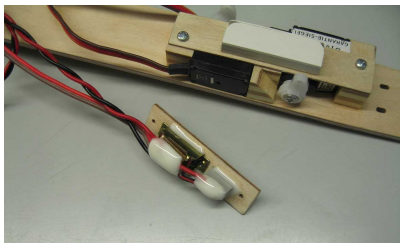
For changing the quartz loosen the screw and pull the servo board about 5cm to the back.

If you want an easy handling of the ready arranged glider, we recommend to mount the switch and the sockets for loading and scanning on a small board as shown.







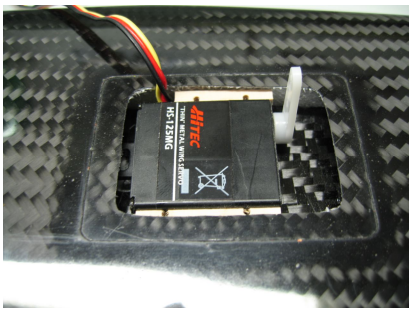


Ready installed switch and socket on the outside of the fuselage.

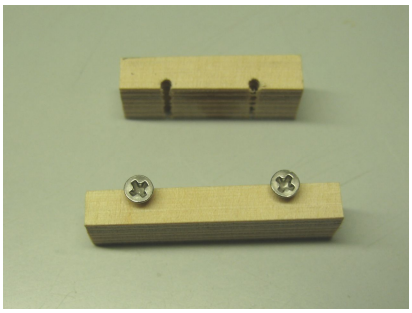
8. Wing

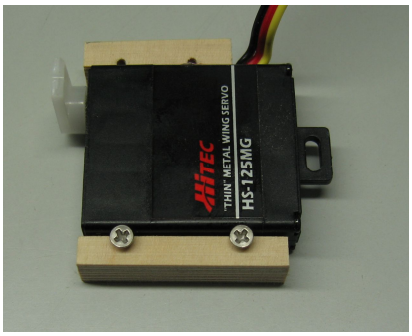
The connection to the levers on the rudder goes crosswise through the wing.

For easy putting in and out of the servos you can make a mounting of plywood.

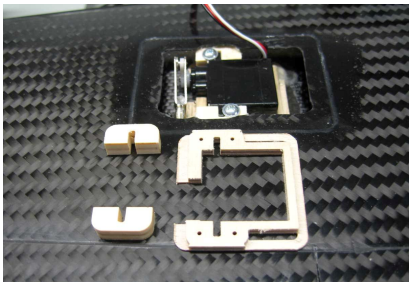


F.e. for Hitec HS-125MG …

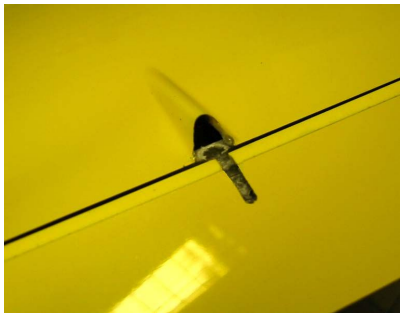




… or for Atlas Hyperion HP-DS09SCD



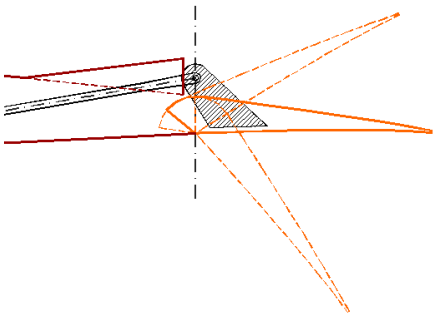
Before you glue the lever to the rudder, mill a slit of about 10-15mm in the control surface as shown on the picture to the right.



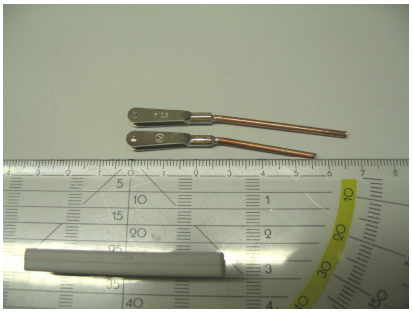
Glue the smaller levers in the ailerons, the bigger ones in the flaps.

For glueing the lever use epoxy-glue with cotton flocks.

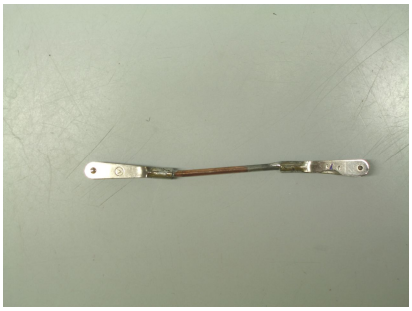
When fitting the lever in the correct position, notice that the hole in the lever should be situated vertically above the hinge line.



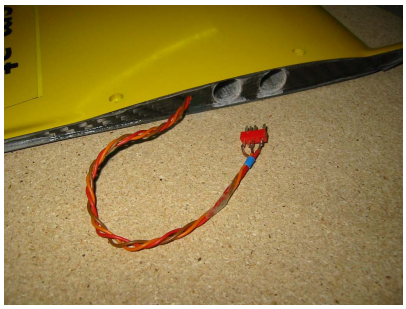
To connect the servos to the levers use two connectors M2,5mm. In between, use a welding rod (diameter 2mm), which you solder inside the both connectors.



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.

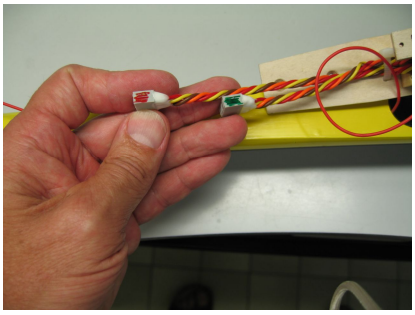


To connect the cables between fuselage and wing you lead one cable out of each part of the wing, length about 20mm, and connect them with two plugs to the fuselage.



If the wing loosens in case of a crash, there might be tension on the cable. To avoid this, we recommend to connect wing and plug with a string, that is a little shorter than the cable.

If you use two seperate plugs for left and right wing, you should mark them with colors to differentiate more easily.



Cut the covers of the servos to the correct size and glue them with a double-sided adhesive.

In order to move the triangular ends of the ailerons, you can bend a piece of steel wire (1mm) 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.

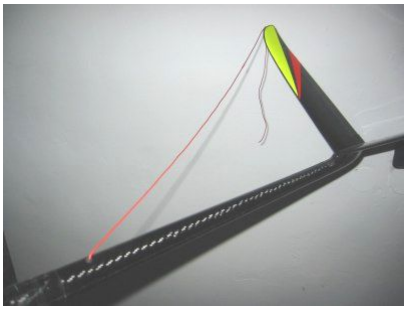
If you want an easier solution, connect the two control surfaces with an adhesive tape.

9. Installation of antenna

As Erwin is completely made of carbon, a part of the antenna must be situated outside the model.

One possiblity is to „extend“ the fuselage at the rear end with a steel wire of about 450mm. Fix the end of the antenna to this steel wire.

Another solution is to fix the antenna to the end of the elevator. Lead the antenna inside the fuse behind the wing and then leave the fuselage. You should add the length between receiver and the breakthrough of the fuselage to the end of the antenna, so that the original length of the antenna is completely outside the fuselage.



Always test the reception on ground before you fly!

Installing 2,4 GHz

The 2 antennas are lead out on the top side of the fuselage in an angle of 90° to each other. Secure them against sliding down with a drop of glue.

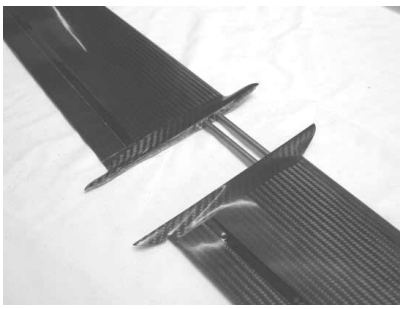
The antennas should be long enough, so you can still pull out the servoboard without problems. Lead the antennas through a hole in the carbon fuse and let them jut out app. 3,5cm. Protect the antenna from being cut by the sharp carbon by using a rubber spout in the hole.

EFORE THE FIRST FLIGHT

10. Ballast system

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

In smooth conditions you can fly Erwin with one carbon connector.



Additionally to the two steel connectors you can add ballast inside the hose between the aluminium pipes. You have to remove the foam and install a ballast tube. The ballast should be divided in two halves.

11. Fixing of the wing

Use 3 layers of tape to fix the wing to the fuselage. Don't use low price products. (The tape should not rustle.) We take tapes made by "Tesa".

In case of a crash, the tape will break, the connecting plug between fuse and wing will loosen, and further damage will be avoided. Normally, you can continue flying without problems.

For extreme use, for example Dynamic Soaring, add further 3 layers of tape.

Note the correct installation of the plug between fuselage and wing. (see point 8.)

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
3. Check reception:
   Leave the antenna inside the radio control and go away from the glider up to a distance of about 60m.
   The rudders should not tremble

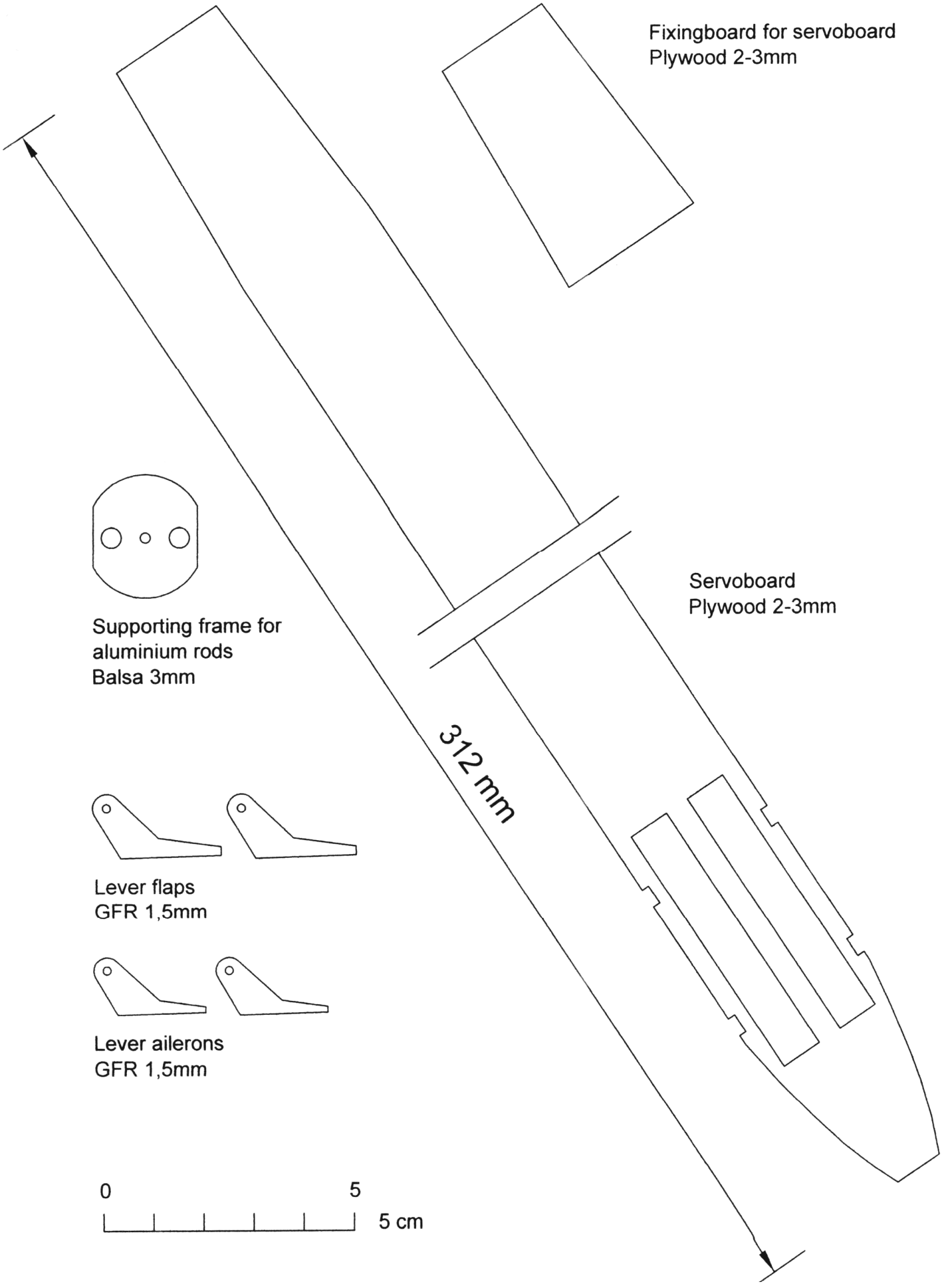
13. Notes for the use

Erwin is sensitive to heat!

Pay attention, that Erwin does not heat up! Therefore:

- 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 inside bags, if you don't fly.
- Avoid all other possibilities to heat up Erwin.

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.


Fixingboard for servoboard
Plywood 2-3mm
Servoboard
Plywood 2-3mm
Supporting frame for
aluminium rods
Balsa 3mm
312 mm
Lever flaps
GFR 1,5mm
Lever ailerons
GFR 1,5mm
0
5
5 cm