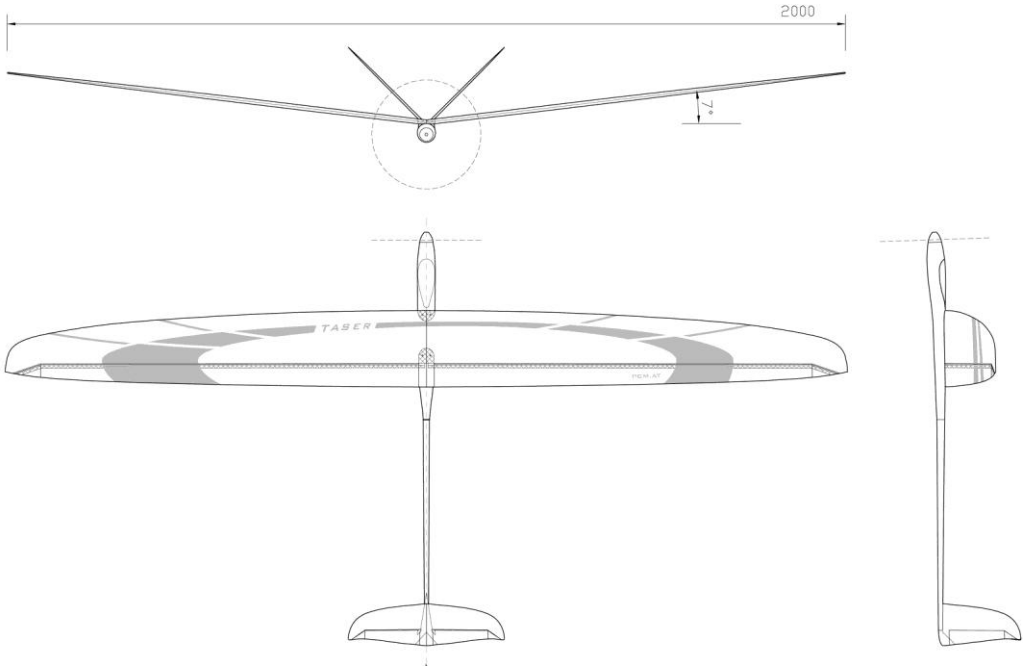
Wingspan [mm]:	2000
Takeoff weight [g]:	450-580
Airfoil:	AG 455ct-02f AG47ct-02f by Mark Drela



BUILDING INSTRUCTION

F5J Electro-thermic-glider TASER

CONTENTS

DATA

ASSEMBLING THE MODEL

SONSTIGES

DATA

1. Kit – contents

Fuselage + canopy
Wing (2 parts) + connector
V-tail

Installation frame for engine
Carbon lever for controlling rudder/elevator, 2 pieces
Carbon lever for controlling ailerons/flaps, 4 pieces
Plastic tube for push rods
Carbon pipe for push rods
Carbon covers, 4 pieces, for wing servos
Kevlar wire for controlling rudder/elevator
Steel wire for torsion spring, 2 pieces
Screws, 4 pieces, for fixing wing

Building instruction

2. What else do you need:

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

Electrical equipment (On/Off-switch, cables, plug, ...)
Electronic equipment (servos, receiver, …)
Steel wire, shrinking tube...

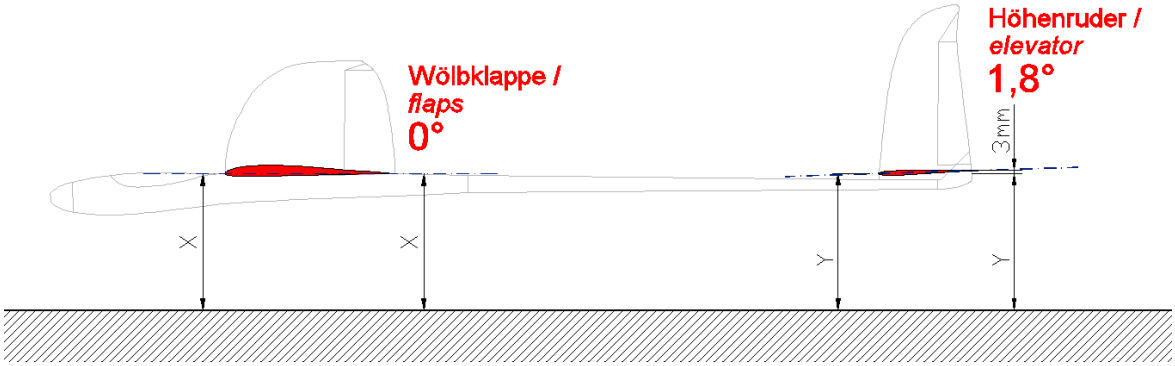
3. Electronic equipment

Servos elevator/rudder:	- Dymond D47 - Futaba FS31 - Expert X31	Alternative (stronger): - HS 5055 MG
Servos aileron:	- Dymond D47 - Futaba FS31 - Expert X31	
Servos flap:	- Dymond D60 - Dymond D47	
Accumulator:	- Lipo 2S from 800 to 1800mA/h - Light version: 2s 730mA/h	
Receiver:	- receiver with 7 channels	
Engine:	- F5J: Roxy 2834-08 - Light version: Axi 2212/26	
Propeller:	- For Roxy 2834-08: 14x8 - Light version: Aeronaut 10x6 for Axi 2212/26	
Controller:	- Dualsky XC3012BA - Light version: Dualsky XL1210BA	
Spinner:	- Outer diameter = 32mm, Diameter of shaft = 3,17mm - Outer diameter = 32mm, Diameter of shaft = 3,17mm	
Logger:	- Logo - Lola - Ram3 - Z-Log - SM-Logger	

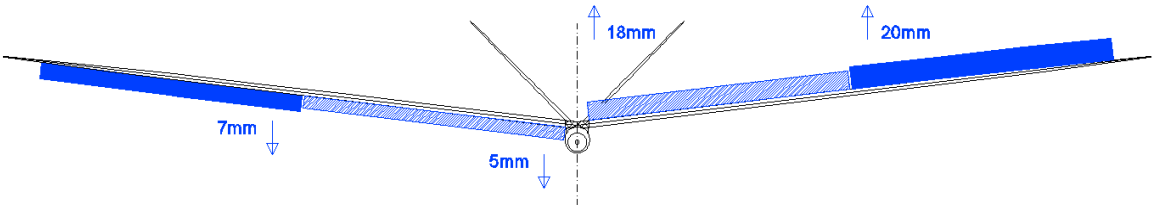
4. Settings for the first flight

Centre of gravity: 60-68mm
(measure from the leading edge of the wing to the back)
If the centre of gravity is more to the front, it is easier to differentiate between gusts and thermals. In addition, the glider lies calmer in the air.

EWD (flaps 0°, elevator 1,8° up)

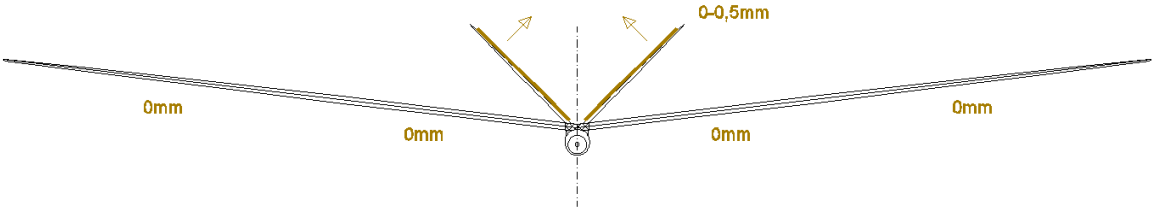


Ailerons (measure near fuselage, respectively at deepest point)



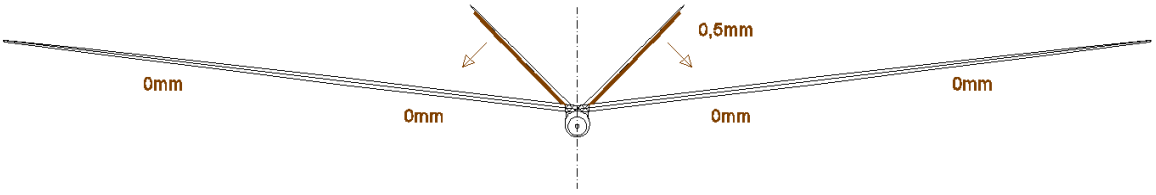
In calm weather use only ailerons (no flaps)

Flaps negative (speed) (measure near fuselage, respectively at deepest point)

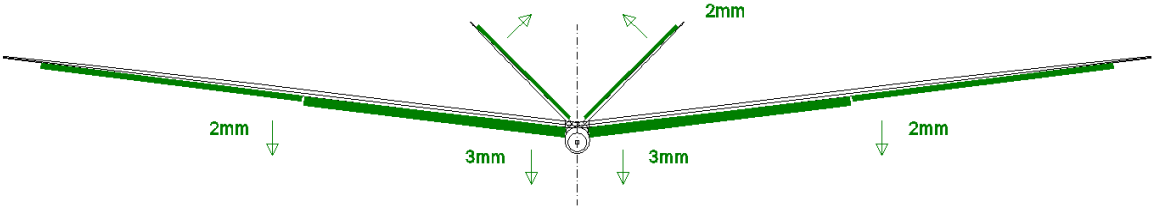


Deflection of elevator depends on strength of wind

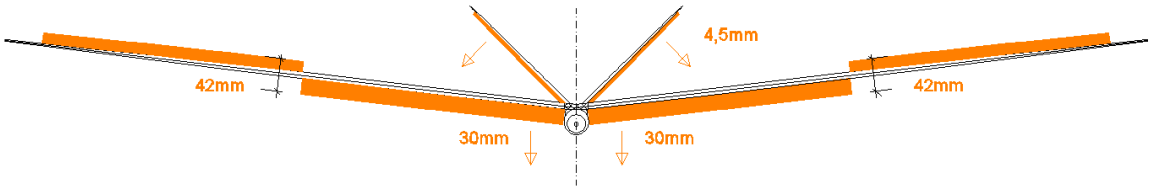
Flaps negative (start) (measure near fuselage, respectively at deepest point)



Flaps positive (thermal) (measure near fuselage, respectively at deepest point)

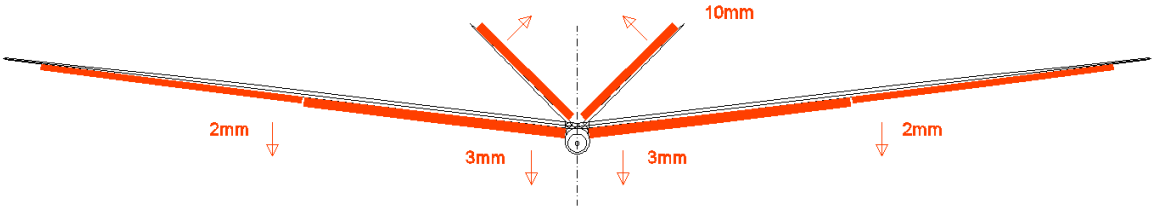


Landing position (measure near fuselage, respectively at deepest point)

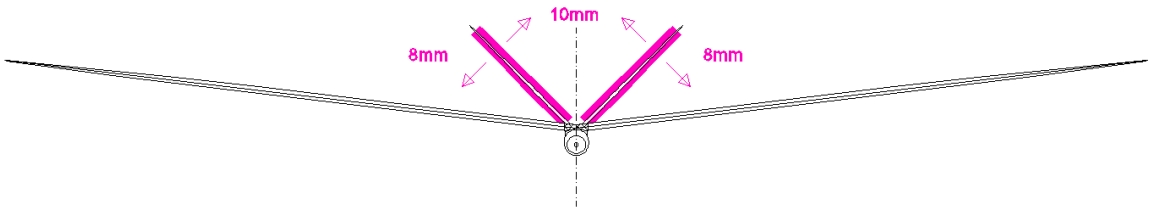


For better controlling mix rudder and flaps to the ailerons
Use as much deflection as possible

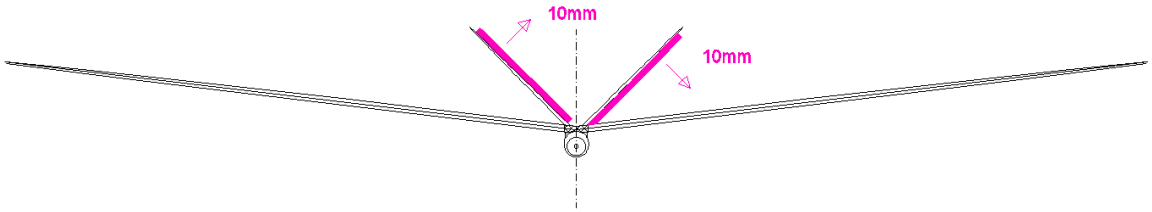
Snap Flap (measure near fuselage, respectively at deepest point)



Elevator (measure near fuselage, respectively at deepest point)



Rudder (measure near fuselage, respectively at deepest point)



ASSEMBLING THE MODEL

General information on lightweight construction

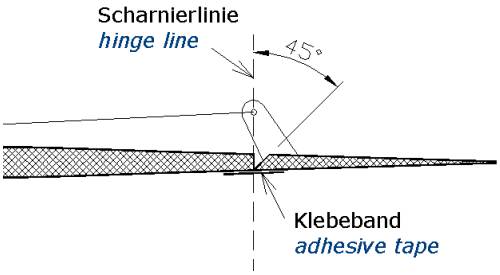
DLG-model respectively lightweight gliders are constructed strong enough to withstand the demands of starting, flying and landing and at the same time light enough to achieve the least possible flying weight. Each part is dimensioned to its possible minimum and produced using lightest and least material.

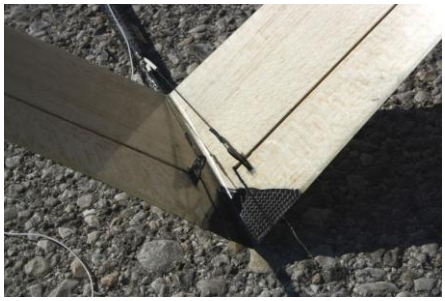
In order to continue this concept, please account the following when you assemble the model.

Always **use glue sparingly**. **Grind** all gluing spots **thoroughly**, before you apply the glue.

5. V-tail

First of all, **glue the levers** on the lower ends of the control surfaces. The **holes of the levers** should be **above the hinge line**.

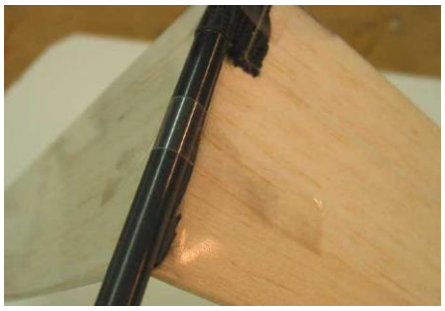




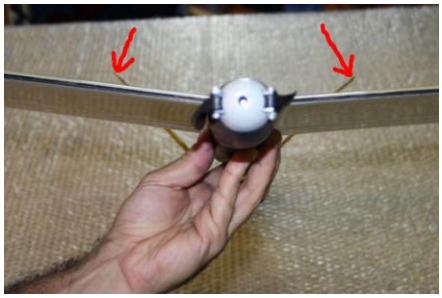
Now, place the V-tail on the boom. Before you glue it, Check the **alignment of the V-tail** regarding the axis of the fuselage and the **EWD**, so that it is fixed correctly.

To do this, mount V-tail and wing on the fuselage. **Fix the V-tail with adhesive tape**. Put another little piece of tape in the middle of the sticky side of the adhesive tape. By this, you will still be able to move the V-tail, as the adhesive tape will not stick to the boom.

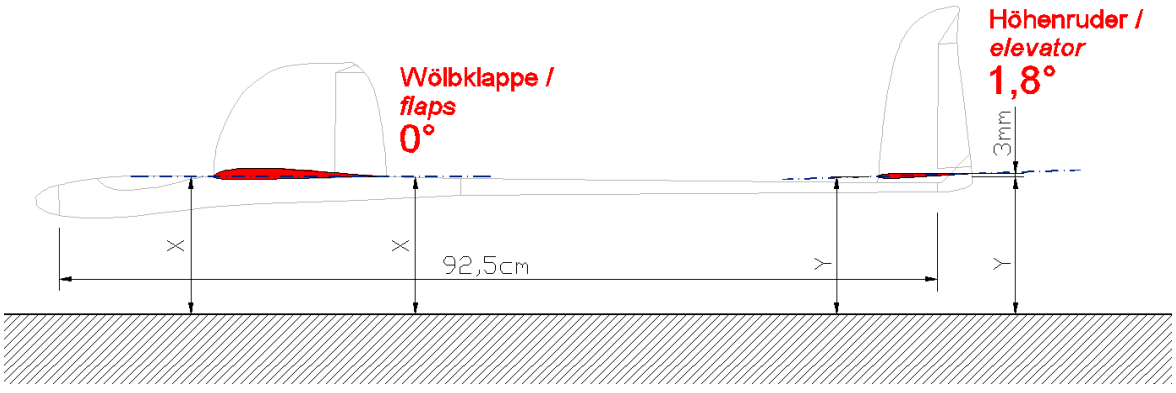
Then, look at the model from the front and slowly lower the tail, until the ends of the elevator disappear behind the wing. If both ends of the elevator disappear at the same time, the V-tail is aligned symmetrically.



Die **EWD** (angle between wing and elevator) must be **1.8°**. Normally, the angle results automatically, if you mount everything correctly. Nevertheless you should check the angle before you glue everything. Proceed according to the drawing below:



If the **wing** is positioned **horizontally**, the **leading edge of the elevator must be 3mm lower than the trailing edge**.



Make sure you have **grinded the gluing spots** on fuselage and V-tail thoroughly, before you glue.

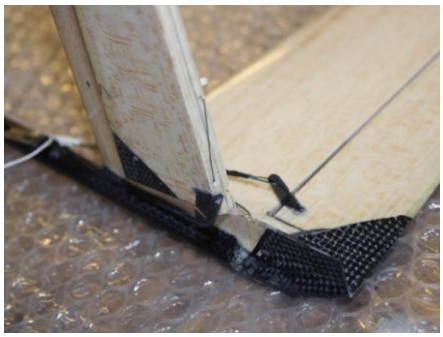
If the V-tail is **aligned correctly**, let **super glue** run into the gluing spot from both sides.

Torsion spring

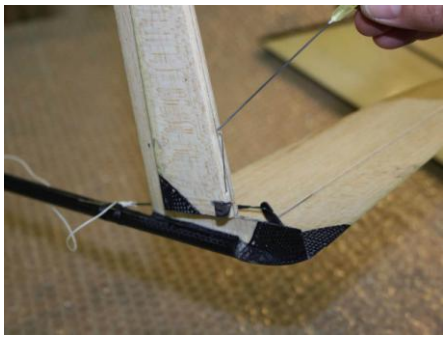
Bend the wires according to the drawing on the right.

Tip back the **control surface** of the rudder completely.

Stick the spring **into the wood.**



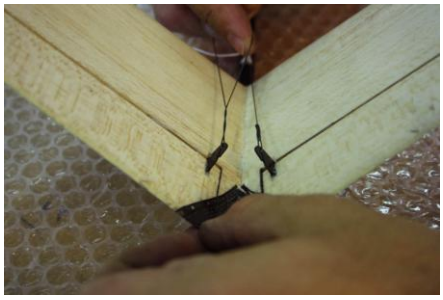
Then **harden** these spots **with super** glue.



Connection of the wire

Now you can **hook in the kevlar wire** into the lever.

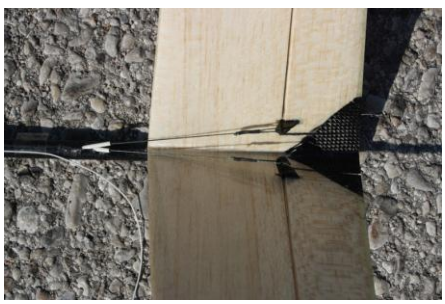
Make a **loop, twist the end** and put the end of the wire into a **shrinking tube**. Shrink it and fix it with a **drop of super glue**.



Drill a small hole in the boom to lead the wire inside the fuselage to the servo.

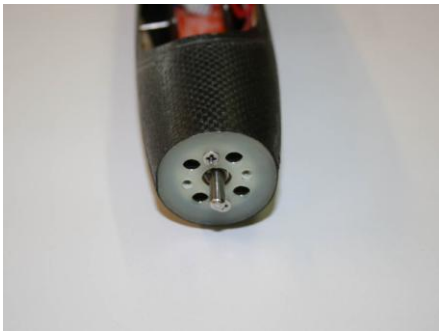
To keep the carbon from chafing at the wire, use a **plastic tube** to lead the wire through the hole.

Note, that the wire keeps **free movable** without problems.



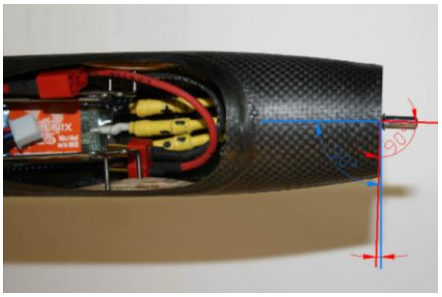
6. Fuselage

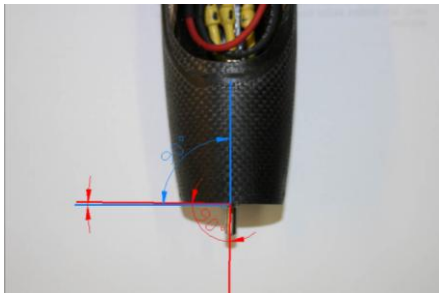
Glue the **installation frame for the engine** with UHU 300 endfest or Pattex Stabilit into the fuselage.



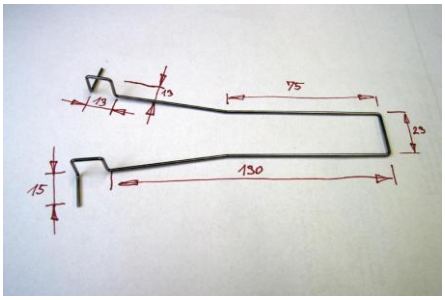
The tip of the fuselage cone is **ready prepared for correct mounting** of the engine. Just glue the frame **flush with the cut** of the fuselage.

Note that the **screws** are positioned **up, down, left and right**. So you can correct the mounting of the engine later by adding thin washers.



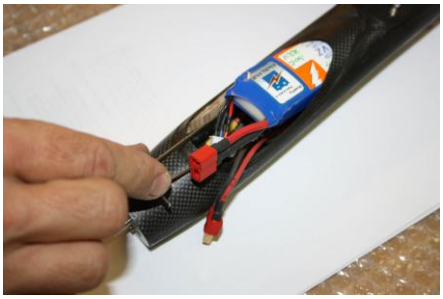


Bend a **steel wire** as shown for **fixing the accumulator** in the fuselage.



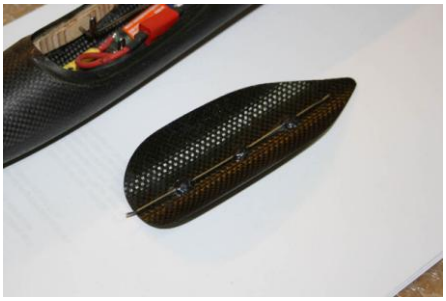
Fix the wire first with **adhesive tape** on the accumulator. So you can **find the correct centre of gravity**.

Use small **pieces of ply wood** with a little hole as **locking mechanism**.



Glue them left and right inside the fuselage.

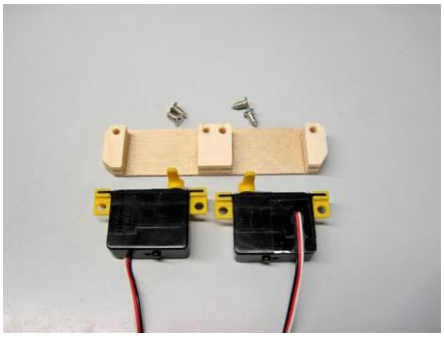
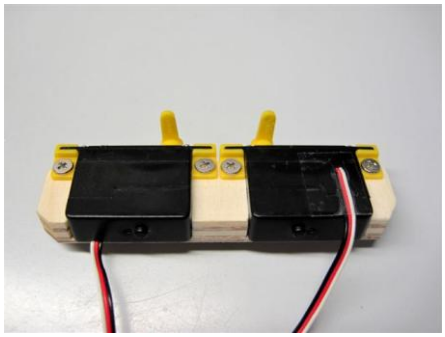
Engine and **controller** are situated below the canopy.



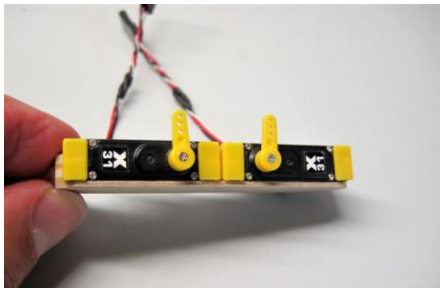
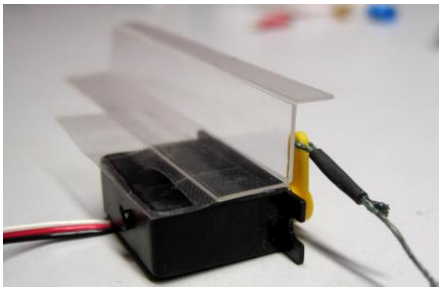
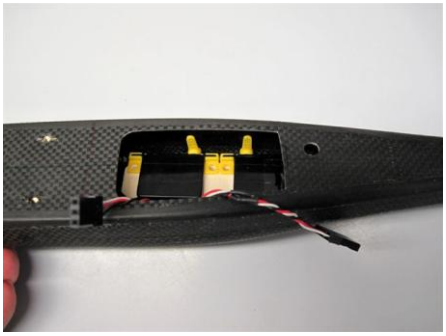
You can easily build a **canopy lock**: Glue a thin rod on the inside of the canopy as shown. The ends should be bent up a little.

Further electronic equipment (**2 servos**, **receiver**) is situated in the **rear part** of the **fuselage**.

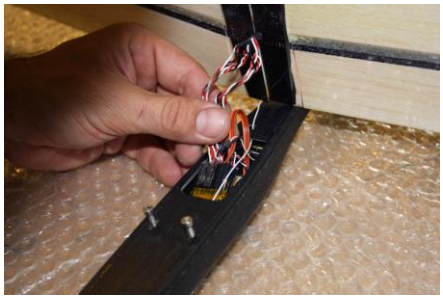

Suggestion for a servoboard for the rear part of the fuselage.

A **partition** element will help you to place **the receiver above the servos**. You can f.e. use a piece of PVC from packing material.

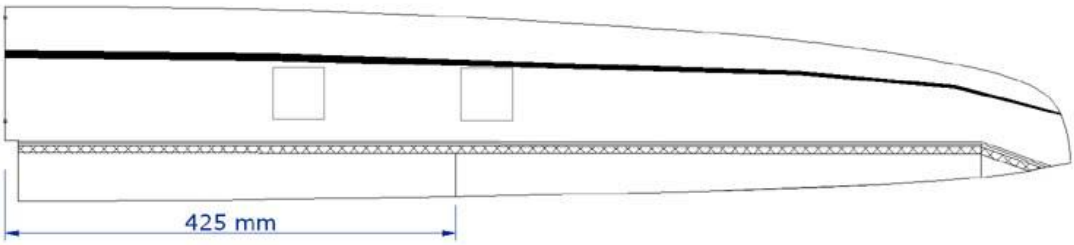

You can plug the cable from the wing **directly to the receiver**.

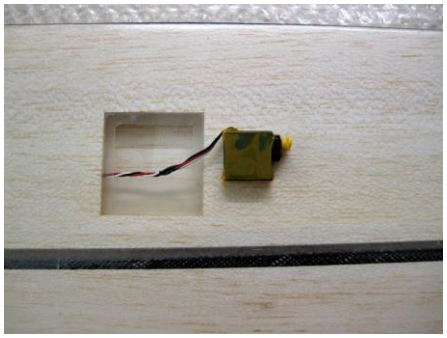
If you have a **hard landing**, always **check** if the engine frame is still fully glued before you make the next start! Also check if all other parts are still working.

7. Controlling the ailerons / flaps

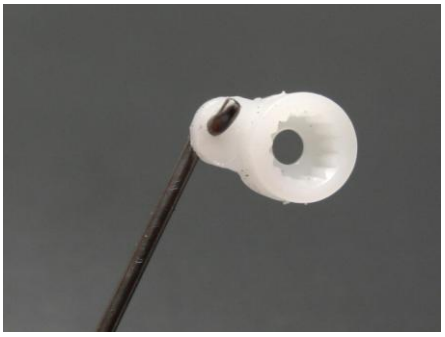
The ailerons are uncut. So you have the possibility to make just flaperons to save weight. But if you want a 4-flap wing, cut the wing as shown in the drawing.

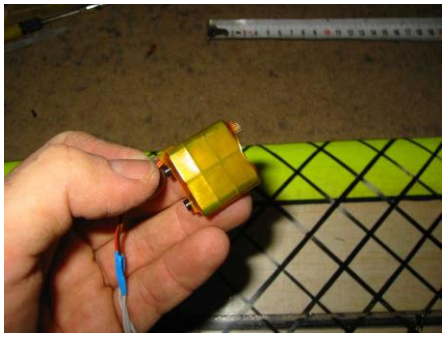


On the underside of the wing you can see the **position of the servos**. Cut **holes** on the underside of the wing with a **sharp knife** inside these deepenings.



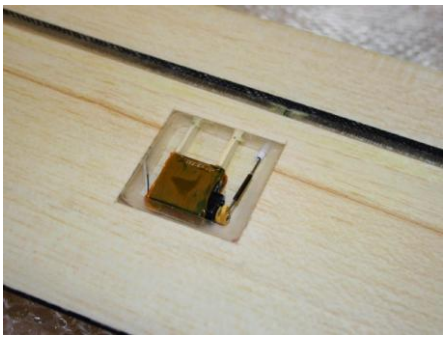
Shorten the lever of the servo, so that it can be moved inside the wing.





Pack the servo inside a **shrinking tube**, so you will be able to remove it again.

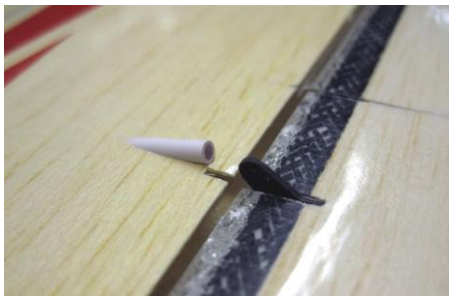
Glue the servo with Stabilit Express or with a 5minute epoxy.



Use a **steel wire, d=1mm**, as pushrod. You can make a **variable joint** by cutting the steel and gluing a piece of carbon pipe on one end.

Drill a **hole to lead the push rod** through the wing and glue a plastic tube for better leading of the push rod.

Cut **2 slits** as shown for fixing the lever.



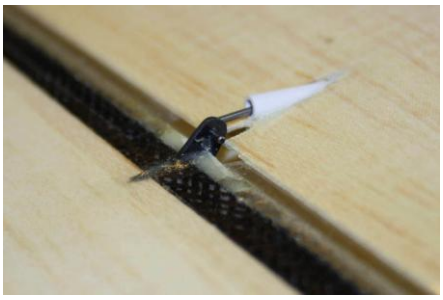
The **hole** in the lever should be a little bit **in front of the turning axis** of the rudder.

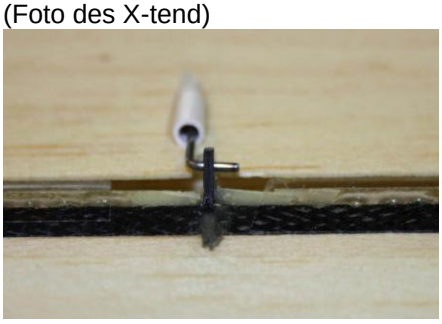
Glue the lever with epoxy glue or Pattex Stabilit.

(Foto des X-tend)

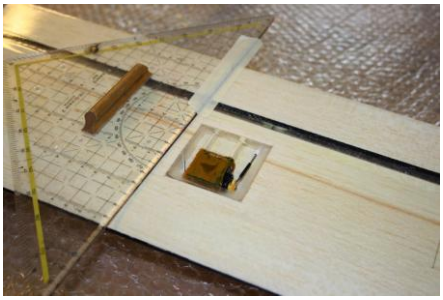
Now you can **thread in the steel wire**.

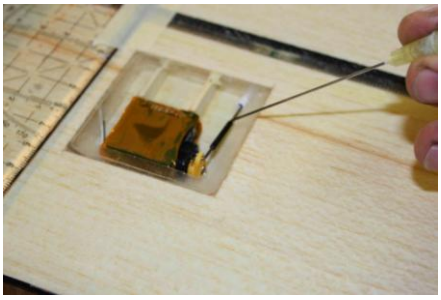
Hook the second part of the pushrod into the lever of the servo and thread it into the joining carbon pipe.





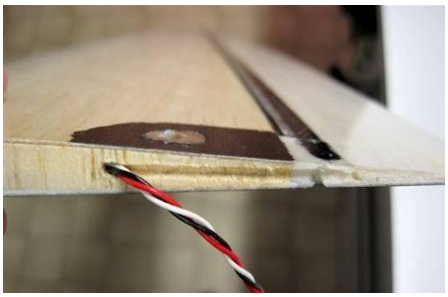
Hold the **aileron in zero-position** with a ruler. Now put a drop of **super glue** in the carbon pipe to fix the length of the pushrod.





Cover the hole in the shell with the carbon cover.

Mill a **slit in the root rib**, where you can put the cable in.



8. Optimizing

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 bend the end of the wire to ensure not to cause damage to the shell on the inside.

The easier way is to connect the control surfaces with **adhesive tape** (see picture).

As you nearly don't recognize a damage of the leading edge of the wing (i.e. after hard landing), we advise to put a **strip of adhesive tape over the leading edge**.

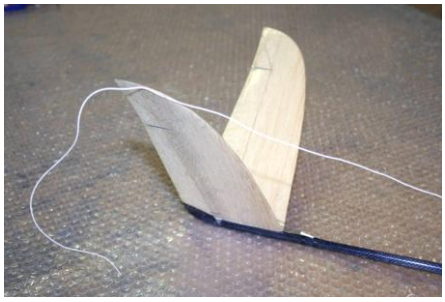
The film is thin enough not to disturb the aerodynamic, but it surely will extend the lifetime of your model.

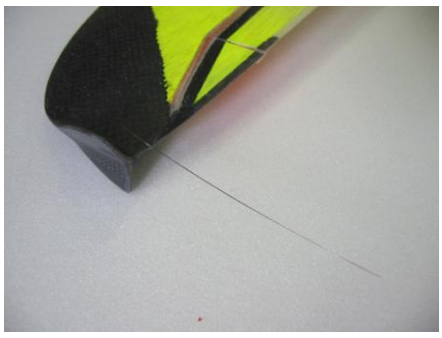
Cover the **screws** with a piece of tape in order to improve aerodynamics.

9. Installation of antenna

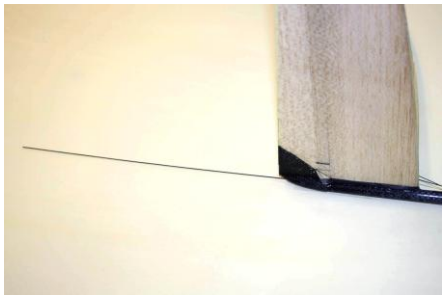
In order to have an undisturbed reception a **part of the antenna** must be situated **outside the model**.

An easy 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.

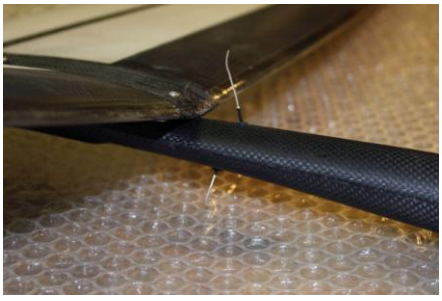




Another possibility is to lay the antenna **inside the gap of the aileron**. For improving reception on **carbon wings** you can solder the antenna to a steel wire, d=0,3mm, which you fix at the end of the wing and let stand out to the back about 10-15cm.



Installation of 2,4 GHz



Always **TEST THE RECEPTION** on ground before you fly!

OTHER

10. Check list before starting:

1. Check **centre of gravity**
2. Check **control surfaces**:
   Do control surfaces move in the correct direction?
   Check the greatest swings
3. Check **reception**:
   Leave the antenna inside the radio control and go away from the glider up to a distance of about 60m. The control surfaces should not tremble.

11. Notes for the use

Taser is partly built with visual carbon fibre. To avoid heating of the carbon surface, the model should not lie **in the sun** too long. **During flight** heating by the sun is no problem, as the model is **cooled by the wind. On ground** the glider should be kept **in the shade.**