

# Innovation






## Building instructions

Congratulations, you have chosen a quality product MADE IN GERMANY.  
Please read these instructions carefully before beginning construction and then proceed with the step by step construction.

### General information about the model:

The **INNOVATION** is a small electric glider (or sailplane) with fully-sheeted wings. Despite the low flying weight, the model can be flown even with some light winds. The wing profile MB 971 is used and contributes to this models ability. With conscientious structure, higher speeds can be achieved.

### Tools and adhesives:

Modelling knife, small balsa plane, 100 and 320 grit sandpaper, a straight building board about 50 x 90 cm  
Superglue, thin CA  and thick CA . UHU plus fast or 5 minute epoxy.   
The corresponding pictograms are inserted in the individual construction sections for the adhesive notes. White glue can also be used for wood joints. However, it is not as easy to sand and causes slightly higher weight. The parts should all be allowed to fully cure and be secured with needles or weights.

### Construction:

The temperature and humidity of the plan can lead to dimensional differences to the components.  
The adhesives given in this manual are only suggestions.  
For large-area gluing, a thick liquid adhesive is suitable. To do this apply the adhesive to the component and then "float" and align. Do not worry, the component can still be moved.  
Now press the component at a corner, check, press on the opposite corner as well.  
If everything fits, press the entire component.  
The side panels are reinforced in the required areas by doublers made of balsa or plywood.  
The ribs and the spar web are pre-cut.  
The wings are built in three parts and are fully sheeted.  
Due to the low profile thickness, tie bars are used.  
The spar web and the ribs are inserted into the lower sheeting for a simple construction.  
To sand the airfoil, profiled templates are attached for the important leading edge.  
The wings of our test models were covered with ORACOVER.  
The rudder deflections given in this manual are a basic setting for the first flights.  
These can easily be adapted to your style of flying.

ENJOY your Innovation!

GRÜNER  
CNC - SERVICE



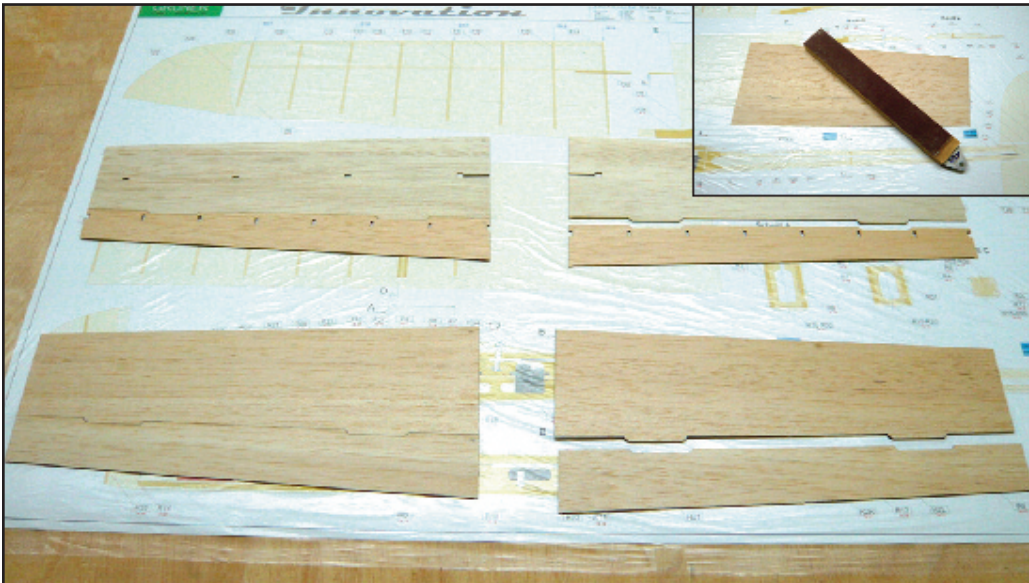
# 1

Sheet No. 74.02  
Parts No. F1

Sheet No. 74.03  
Parts No. F2, F4

Sheet No. 74.01  
Parts No. F3

- Cover the blueprint with saran wrap (clear plastic).
- Glue the lower sheeting for the center panel, part F1 and F2 together. 🛠️
- Glue together the upper sheeting for the center panel, part F3 and F4 together. 🛠️



# 2

Sheet No. 74.07  
Parts No. F5

Sheet No. 75.05  
Parts No. F6



Sheet No. 74.06  
Parts No. F7


Sheet No. 74.04  
Parts No. F8






- Glue the lower sheeting for the outside panels F5 and F6 together. 🛠️
- Glue together the upper sheeting for the outside panels F7 and F8. 🛠️
- All surfaces should be sanded on both sides until no more transitions can be felt.



		3
		Sheet No. <span style="color: red;">74.13</span> Parts No. <span style="color: red;">F9, F10</span>

- Glue the web spar for the center panel, part F9 to the lower sheeting F1 / F2. 
- Glue the web spars F10 for the outer surfaces of the lower panel F5 / F6. 
- **Caution:** make sure that you make a **left** and a **right** component.
- Line up the lower panels F1 / F2 and F5 / F6 at the rear edge up to the dotted line on the plan (evenly).  
**Temporarily** insert the respective outer ribs into the indentations. Use a soft pencil and draw a line from one rib **end** to the other. Use a sanding pad to sand down the angle at the trailing edge.  
NOTE: The goal is to have the trailing edge at 0.5mm thick.

		4
		Sheet No. <span style="color: red;">74.16</span> Parts No. <span style="color: red;">F12</span>
		Sheet No. <span style="color: red;">74.18</span> Parts No. <span style="color: red;">F11</span>
		Sheet No. <span style="color: red;">74.08</span> Parts No. <span style="color: red;">F13</span>

- The plywood ribs F11 should be glued to the middle rib F12 on both sides. 
- Glue together F27 wing anchorage. Wing anchorage will be glued **AFTER** covering. 
- Assemble and glue ribs F13 at their given positions on the sheeting F1 / F2 and on the web spar F9. 
- Glue the center rib F11 / F12 and the reinforcement F12a at the specified position. 
- Line up the hole in the reinforcement with the hole of the lower sheeting.
- Attach the connecting ribs F14 to the sheeting F1 / F2 and to the web spar F10. 
- **Caution:** The ribs F14 must sit against the angle of the spar F10.  
The angle of the spar is what creates the V-shape of the wing.



# 5

Sheet No.

74.09

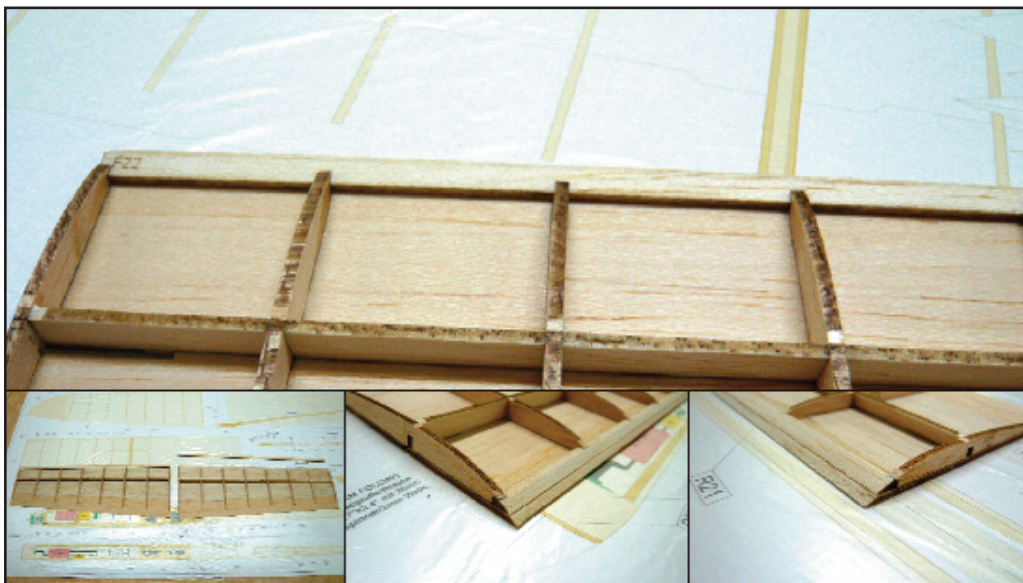
Parts No.

F14 - F21

- Insert and glue ribs F15 - F21 at the predetermined positions on the panels F5 / F6 and to the web spar F10. 🛠️
- Attach the connecting ribs F14 to the sheeting F5 / F6 and to the spar F10. 🛠️

**Caution:** The ribs F14 must sit against the angle of the spar F10.

The angle of the spar is what creates the V-shape of the wing.



# 6

Sheet No.

70.13

Parts No.



F22, F23

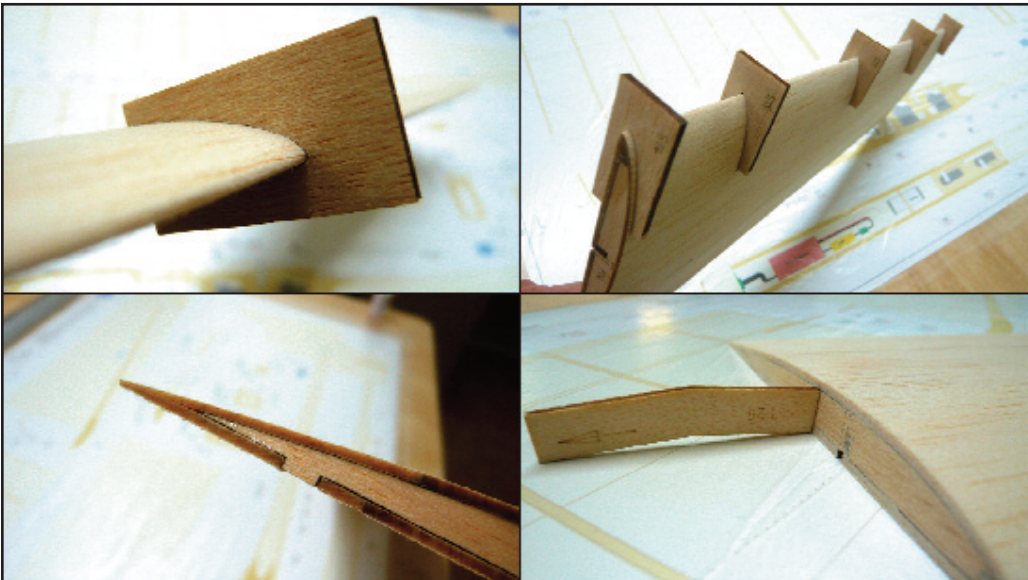
- Insert the leading edge F22 into the recesses of the ribs for the center panel.  
If the leading edge lines up well with the ribs and the sheeting then glue in place. 🛠️
- Insert the leading edge F23 into the recesses of the ribs for the outer surface parts.  
If the leading edge lines up well with the ribs and the sheeting then glue in place. 🛠️
- Plane or sand the leading edge following the profile. See also section D and E.  
While sanding, **be careful not to damage the ribs.** (Tip, use tape to mask ribs)





7

- Glue the upper sheeting F3 / F4 to the center panel.  
Make sure to add glue on all ribs, the spar, the leading edge and the angled trailing edge of the lower sheeting.   
Position the upper sheeting and secure it with needles and weights.
- Caution:** To get a flat and straight wing, the wing center section should be left until fully cured.  
The upper sheeting must be pressed at all gluing points.
- Glue the upper sheeting F7 / F8 for the outer surface parts.   
Use the same procedure as used for the center panel.



8

Sheet No.	74.08
Parts No.	S14
Sheet No.	74.09
Parts No.	S15, S17, S19, S21
Sheet No.	74.18
Parts No.	F26



- Cut the overhanging sheeting on the leading edge and the sand the leading edge of the center part using the stencil S14.
- Cut the overhanging sheeting on the leading edge and the sand the leading edge of the outer panels according to the templates S15, S17, S19 and S21.
- Note on positioning the templates:** template number corresponds to the rib number.  
The leading edge F22 should not be visible after sanding. See also section D and E.
- Sand the sheeting at the trailing edge. (follow the airfoil)  
The trailing edge should have a thickness of approx. 1mm.
- Carefully sand the sides of the middle section carefully, with the exception of the connecting ribs F14.
- Carefully sand the sides of the outer panels, with the exception of the connecting ribs F21.
- Note:** To verify the V shape, the F26 joiner can be used upside down (**only to verify angle**).

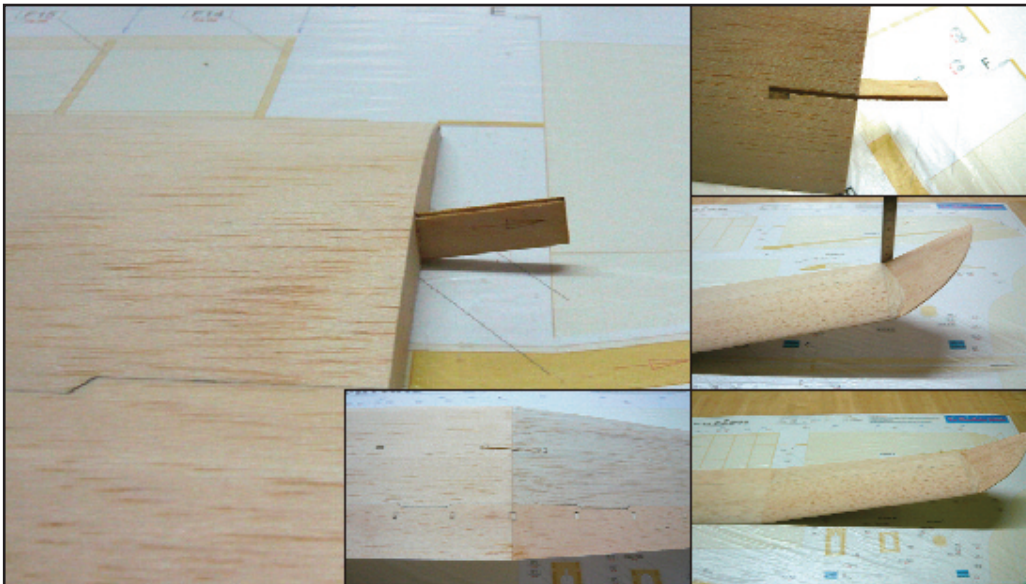


# 9

Sheet No. *In kit*  
Parts No. F24



Sheet No. *74.14*  
Parts No. F25

- Divide the edge strip F24 (triangular piece of balsa) in 2 even pieces.
  - Glue the edge curves F24 flush to the outer parts of the surfaces. 
  - After the glue has cured, gently sand to match the airfoil.
- TIP:** A sheet of paper or masking tape can be applied to the sheeting to protect it from damage during sanding.
- Before gluing**, verify the V shape of the wingtips (approx. 37mm +/- 3mm at the tip).
- Note:** It is important that the measurement is identical on both tips.
- Glue the Wingtips F25 and sand after curing. 



# 10

Sheet No. *74.18*  
Parts No. F26

- Carefully press the perforated area on the connection rib F14 with a knife.
  - Dry fit the wing joiner F26 to the center panel with the arrows to the outside and verify the V shape. (Measure 55 +/- 3mm on the rib F21).
- The connecting ribs should be flush to each other. If everything fits, glue both wing joiners F26 (with the arrows to the outside) on the center panel. Use 5M **EPOXY** 
- Warning :** The gluing surfaces for the spar and the sheeting must be flat/flush. The same also applies when connecting to the outer parts.
- Glue the outer panels. To join the outer panels, apply epoxy to **both** connecting ribs F14 over the entire surface.   
Verify the V-shape on both sides (dimension 55 +/- 3mm on the rib F21).
- Note :** It is important that the measurement is the same on both sides.





# 11

Sheet No. 74.10

Parts No. R1

Sheet No. 74.11

Parts No. R2L, R2R

- Glue a front side part R1 to the rear side part R2L. 🛠️
- Glue a front side part R1 to the rear side part R2R 🛠️

**Note:** The difference between the two sides is that the right side opening for the pushrod cable is wider than the left.



# 12

Sheet No. 74.19

Parts No. R3

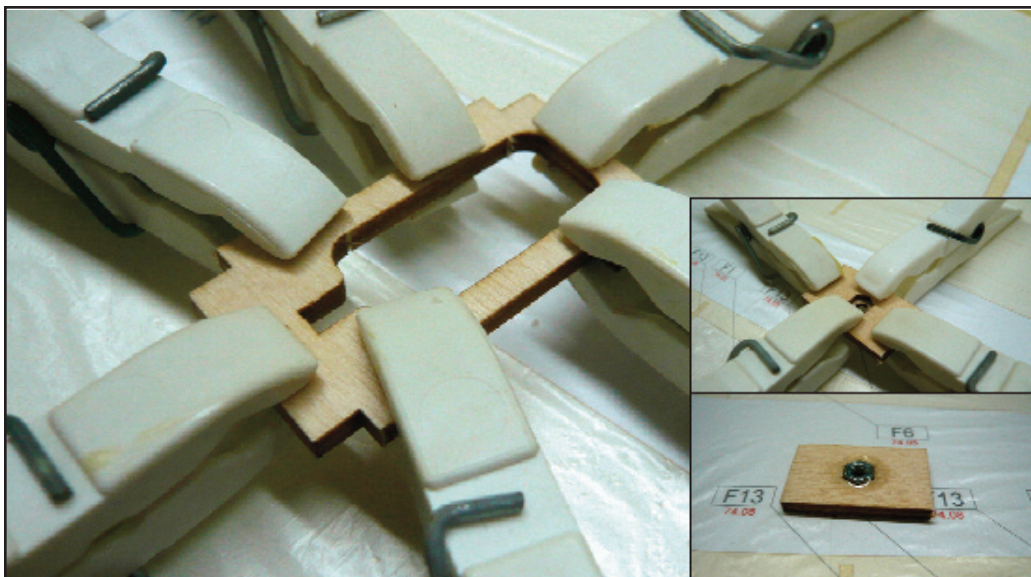
Sheet No. 74.17

Parts No. R4, R5

- **Caution:** It is important to have a **left** and a **right** component for the construction of the fuselage.
- Glue the fuselage doubler R3 exactly flush to the side part R1 / R2. 🛠️
- Glue the lower doubler R4 to the bottom edge exactly flush with the side part R1 / R2. 🛠️
- Glue the upper doubler R5 at the top edge exactly flush to the side part R1 / R2. 🛠️

**Note:** When using white glue, allow all components to complete cure.

Secure the needles and or weights. Spend the time now to be precise, and less work will be required later.



# 13

Sheet No. **74.18**

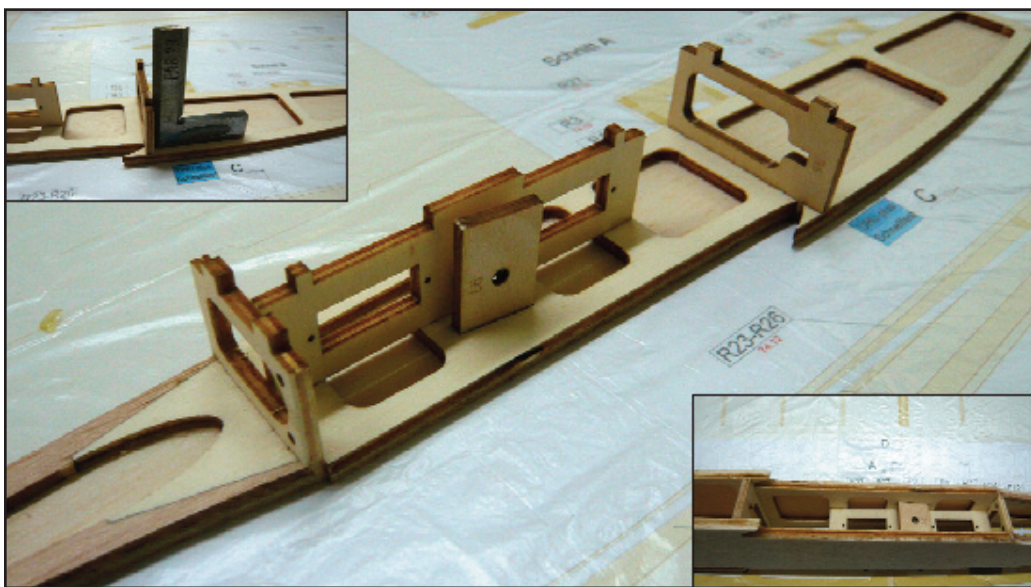
Parts No. R6, R7  
R8

Sheet No. **Small parts**

Parts No. R9

- Glue the R6 pieces and clamp them together. 🛠️
- Glue the parts R7 and R8 to each other and clamp until cured. 🛠️
- Glue the nut R9 with epoxy. 🛠️

**Caution:** Ensure no glue gets into the threads.



# 14

Sheet No. **74.19**

Parts No. R10, R11

Sheet No. **74.16**

Parts No. R13

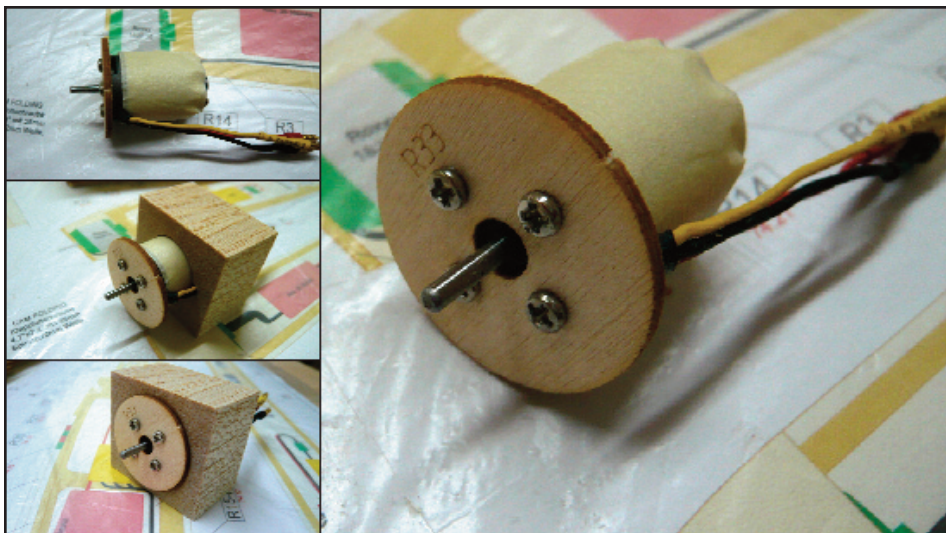
- Verify the frames R6 and R11, servo frame R10 and the wing holder R7 / R8 that they all fit at right angles into the corresponding slots of the doubler R3 of the right fuselage.

Glue to right side. 🛠️

**Note:** For R6, the notch for the wing anchor points upwards (see section A),  
In the case of the frame R11 the holes are pointing upwards (see section B).

- Mark the installation location for the R12 bulkhead.
- Glue R13 in position. 🛠️
- Glue the left side of the fuselage. Use weights or small clamps. Keep everything aligned until cured. 🛠️





# 15

Sheet No. **74.21**

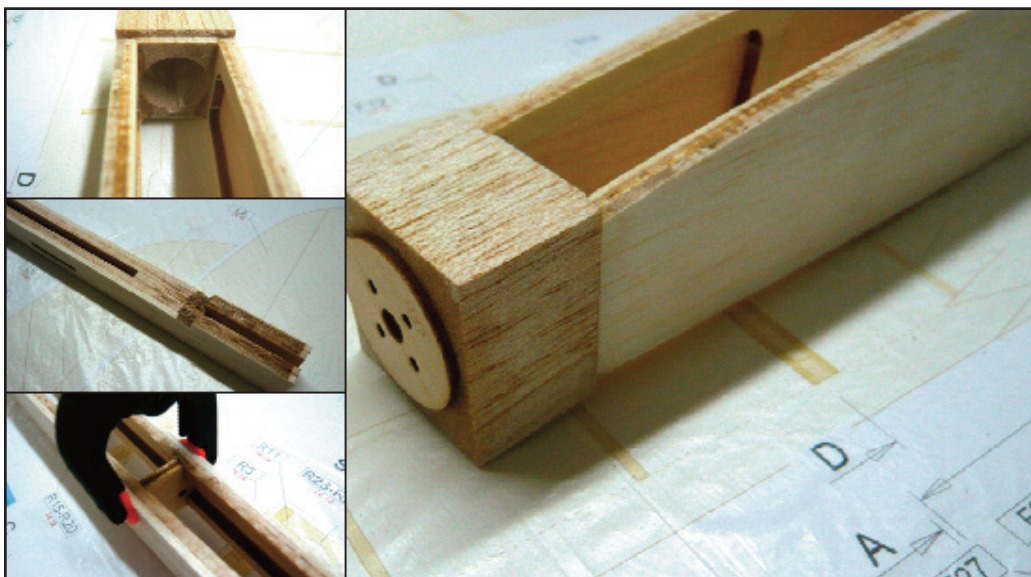
Parts No. **R14**

Sheet No. **74.18**

Parts No. **R33**

- Screw the motor to the motor bulkhead R33 using the enclosed screws. Wrap the motor in paper/ or tape so that it fits snugly into the nosepiece. This will ensure that the motor is centered and that the motor will turn freely after gluing the bulkhead.
- Apply a small amount of glue to the motor bulkhead. 🛠️
- Insert the motor with the wires into the nose block R14. The motor wires must be in the provided groove. **Tack** the components with small amount of glue. Clamp or use tape until they cure. Remove the motor (and tape/paper) and glue the motor bulkhead securely with a thin CA to the entire circumference. 🛠️ Allow the adhesive to cure.

**Caution:** The adhesive penetrates the wood grain and hardens the nose block.



# 16

Sheet No. **74.19**

Parts No. **R12**

- Glue the nose block R14 to the fuselage and secure with clamps. 🛠️
- Align the fuselage directly on the top of the plan and glue R13 together. 🛠️
- Glue R12 at the marked location. 🛠️

**Caution:** Make sure that the boom is straight.


**Note:** The holes are located towards bottom (see section C)



# 17

Sheet No. **74.12**  
Parts No. **R15 - R20**

Sheet No. **In kit**  
Parts No. **R21, R22**

- Glue the bottom of the fuselage R15 to R20 starting from the end of the fuselage and secure with needles. 

**Note:** Make sure that the boom is straight.

The last piece R15 must be trimmed to fit.

- Feed the guide tubes R21 and check for smooth operation of the pushrod cables R22.

**If necessary**, slightly enlarge the openings in the sides of the fuse using a 2mm drill bit.

File opening at angle to fit tube. Secure the guide tubes with epoxy. 

After curing, cut the guide tubes flush with the sides.

**Note:** The guide tubes run crosswise **behind** R12.



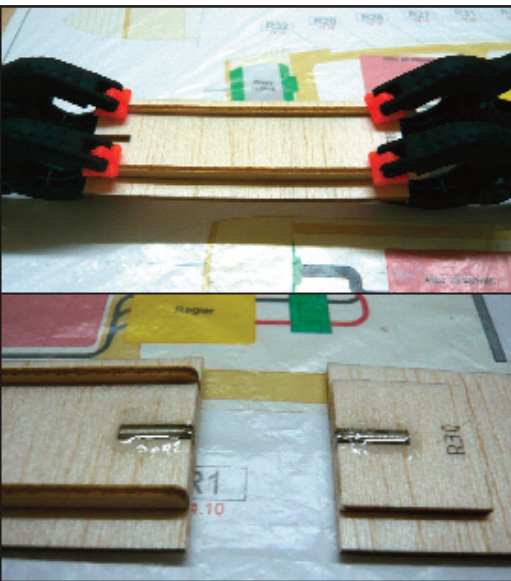
# 18

Sheet No. **74.12**  
Parts No. **R23 - R26**

- Glue the rear fuselage cover R23 to R26 starting from the frame R11. 

**Caution:** Be careful to not twist the boom while glueing.

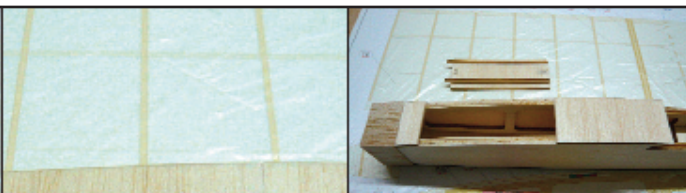




# 19

Sheet No.	74.12
Parts No.	R27, R28 R30
Sheet No.	74.18
Parts No.	R29
Sheet No.	Small parts
Parts No.	R31

- Place the R28 battery hatch doubler in the center, flush with the front and rear and glue to R27.
- Glue the reinforcements R29 to the left and right to the doubler R28 and to R27.
- Caution:** The square end of the reinforcement R29 must be flush with the side with the **notch** for the magnetic closure in doubler R28.  
The rounded side of the reinforcement is on the other side of the battery, hangs past about 8mm.
- Glue the magnetic holder R30 exactly to the middle of the notch with a notch F27.
- Glue the magnets R31 with epoxy.
- Caution:** Observe the polarity of the magnets, they must pull towards each other.





# 20

Sheet No.	74.12
Parts No.	R32



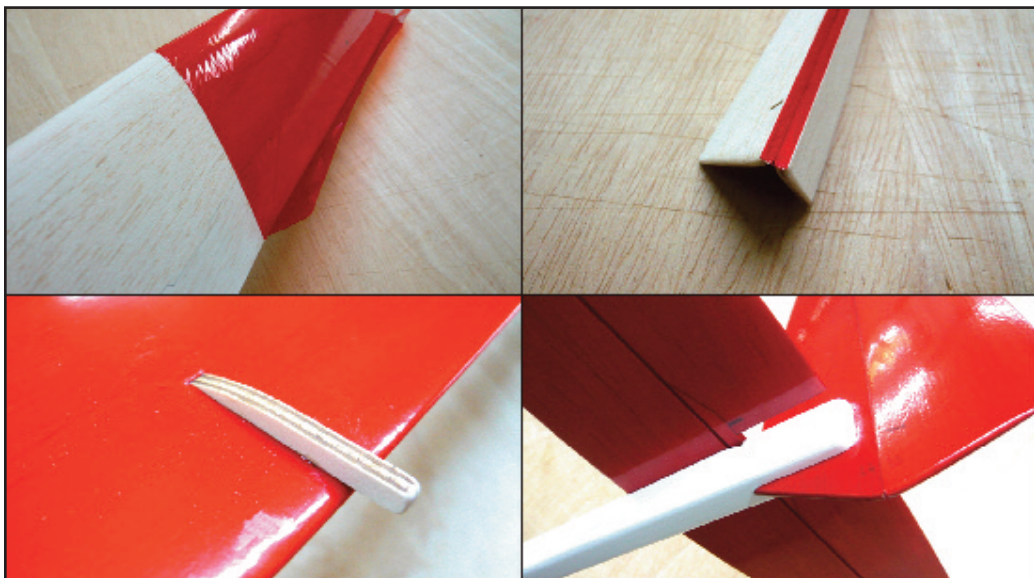
- Glue the small sheet R32 flush to the nose cone.
- Place the battery hatch and slide it against the panel F32. (**do not glue it ;**)  
**Note:** the battery hatch should slide on smoothly. If necessary, slightly sand the sides of R29
- Glue the rear panel R27 with approx. 0.5mm distance to the battery hatch.
- If the model is to be built as a sailplane, the nose cone can be built from parts SN1-8.  
To do this, slide the parts one after the other onto a remaining piece of guide tube and glue them together   
Then glue the nose on the motor frame.
- Sand the fuselage according to sections A, B and C.



		<b>21</b>
Sheet No.	74.18	
Parts No.	L1	
Sheet No.	74.15	
Parts No.	L2, L3	
Sheet No.	74.16	
Parts No.	L4, L5	

- Join together the connectors L1. 
- Glue the elevator L2 to the connector L1. 
- Sand all elevator parts L1, L2 and L3 as well as rudder parts L4 and L5  
Sand and bevel according to the shaded cuts in the plan.

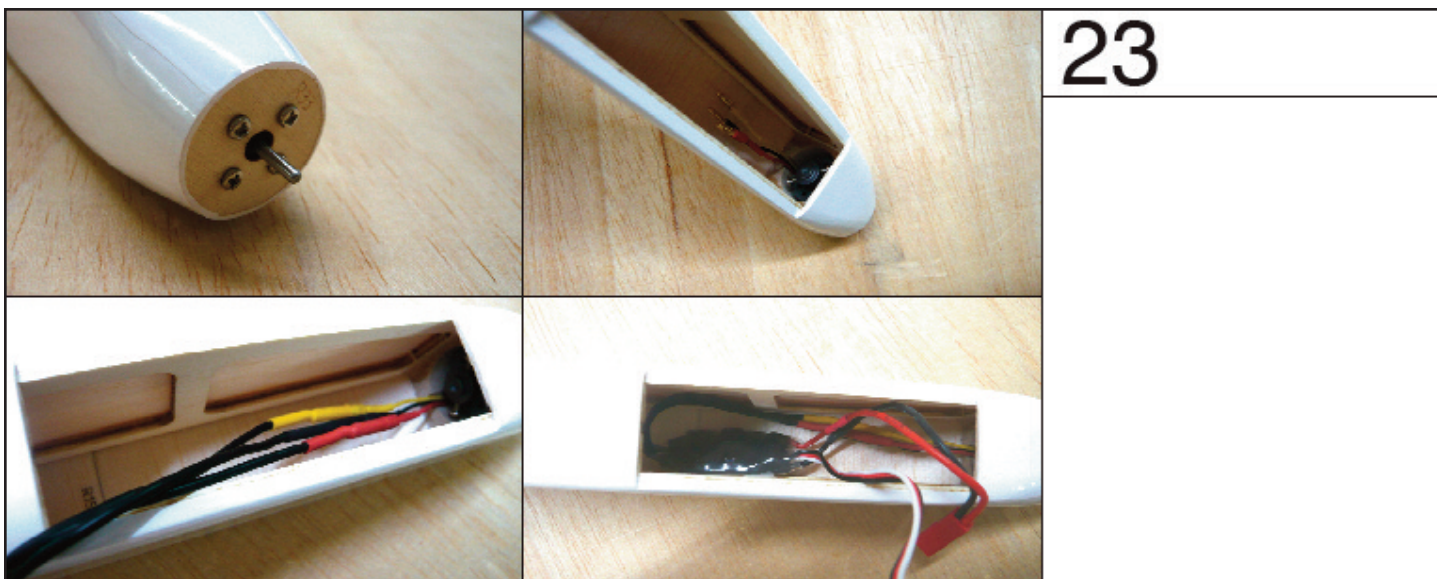
**Note:** Make sure that the specified rudder deflections are achieved.

The tail surfaces are mounted on the fuselage only after the covering.

		<b>22</b>
Sheet No.	Small parts	
Parts No.	R34	

- For the covering we recommend ORALIGHT for the wings and stabilizers.  
Alternatively ORACOVER can be used for the fuselage.  
The rudder can be covered directly with covering.  
You can also find instructions at <https://www.oracover.de/>
- Carefully remove the covering from the gluing points to glue the control horns.  
**Caution:** do not damaged the wood. (**hint:** use a hot pin to melt covering for control horns)
- Glue the F27 wing anchor in position using **5M EPOXY** and glue the elevator and rudder. 
- Glue the control horns. **5M EPOXY** . The rudder must be exactly at right angle to the elevator. (See construction section no. 25) 





# 23

- Install the motor and the ESC.

**Note:** To prevent the motor cable rubbing between the motor bell and the fuselage. Glue in a small piece of balsa over the wires to the fuselage doubler.



# 24

Sheet No. *In kit*

Parts No. *R22*

Sheet No. *Small parts*

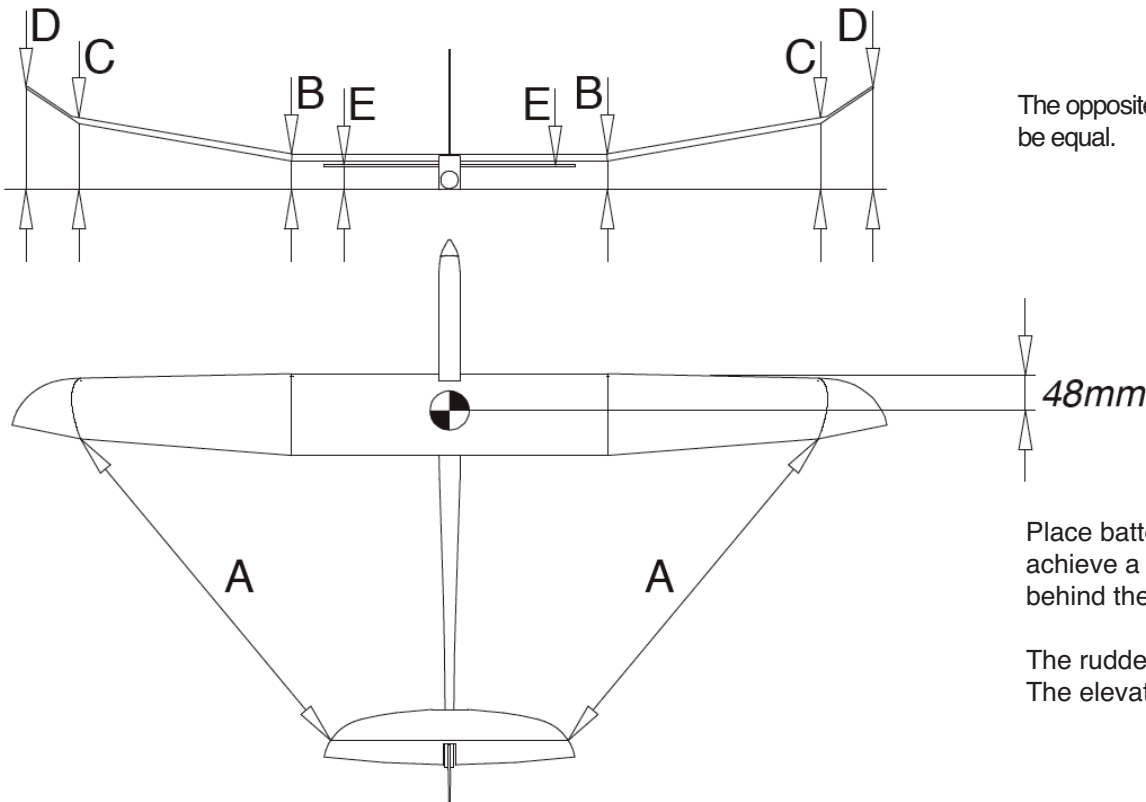
Parts No. *L6*

- Install the servos (no screws yet). Set servo arms accordingly.
- Create Z bend on the pushrod R22 at one end and install on the servo arm.
- Insert (do not glue, see below\*\*) the rudder horn L6 into the slot provided for the rudders.
- Insert the pushrod into the guide tubes and connect the servo arms at center.  
Attach servos with screws.
- Bend the pushrod cables at the rear end at right angles and hang them on the rudder horn.  
The rudder must also be at neutral.
- Secure the pushrod cables on control horn by sliding a piece of leftover guide tube R21. 🛠️

\*\*When everything fits, the control horns are glued. **5M EPOXY** 🛠️

- Connect the servos and the ESC to the receiver and install the receiver.
- Mount the propeller according to their enclosed instructions and GO FLY (after doing your safety checks)!!

## Aligning empennage and wings



## Flying

Test the model initially by throwing it into the wind. Trim to make sure that it flies properly. Once the glider is trimmed properly and flies straight. Then the motor can be used.

When using the motor sometimes it is necessary to use down elevator. This can be trimmed out by using a mix/launch mode on the radio to compensate.

## PARTS LIST

No	Qty	Description	Material	Sheet No.
F1	1	Lower sheeting, center	Balsa 1,5mm	74.02
F2	1	Lower sheeting, center	Balsa 1,5mm	74.03
F3	1	Upper sheeting, center	Balsa 1,5mm	74.01
F4	1	Upper sheeting, center	Balsa 1,5mm	74.03
F5	2	Lower sheeting, outer	Balsa 1,5mm	74.07
F6	2	Lower sheeting, outer	Balsa 1,5mm	74.05
F7	2	Upper sheeting, outer	Balsa 1,5mm	74.06
F8	2	Upper sheeting, outer	Balsa 1,5mm	74.04
F9	1	Spar web center	Balsa 2,0mm	74.13
F10	2	Spar web outer	Balsa 2,0mm	74.13
F11	2	Rib	Balsa 1,5mm	74.18
F12	1	Rib	Balsa 3,0mm	74.16
F13	10	Rib	Balsa 2,0mm	74.08
F14	2	Rib	Balsa 2,0mm	74.08
F14 - F21	2 set	Rib	Balsa 2,0mm	74.09
F22	1	Leading edge	Balsa 2,0mm	74.13



No.	Qty	Description	Material	Sheet No.
F23	2	Leading Edge	Balsa 2,0mm	74.13
F24	2	Wingtips	Balsa 8 x 18 x 200mm	74.22
F25	2	Wingtips	Balsa 2,0mm	74.14
F26	2	Wing joiner	Plywood 1,5mm	74.18
F27	2	Wing Anchor	Plywood 1,5mm	74.18
R1	2	Front fuselage side	Balsa 2,0mm	74.10
R2l & R2r	je 1	Rear fuselage side	Balsa 2,0mm	74.11
R3	2	Fuselage doubler	Plywood 3,0mm	74.19
R4	2	Lower boom doubler	Balsa 3,0mm	74.17
R5	2	Upper boom doubler	Balsa 3,0mm	74.17
R6	2	Rib	Plywood 1,5mm	74.18
R7	1	Frame	Plywood 1,5mm	74.18
R8	1	Frame	Plywood 1,5mm	74.18
R9	1	Nut	M3	Small parts
R10	1	Servo tray	Plywood 3,0mm	74.19
R11	1	Rib	Plywood 3,0mm	74.19
R12	1	Rib	Plywood 3,0mm	74.19
R13	1	Filler	Balsa 3,0mm	74.16
R14	1	Nose block	Balsa 25mm	74.21
R15	3	Fuselage bottom	Balsa 2,0mm	74.12
R16 - R20	1 set	Fuselage bottom	Balsa 2,0mm	74.12
R21	2	Guide tube	Plastic 2,0x500mm	In kit
R22	2	Pushrod	Steel 0,8x500mm	In kit
R23 - R26	1 set	Fuselage top	Balsa 2,0mm	74.12
R27	2	Fuselage top, battery hatch	Balsa 2,0mm	74.12
R28	1	Battery hatch doubler	Balsa 2,0mm	74.12
R29	2	Battery hatch reinforcement	Plywood 1,5mm	74.18
R30	1	Magnetic holder	Balsa 2,0mm	74.12
R31	2	Magnet rod	2x10mm	Small parts
R32	1	Top sheeting	Balsa 2,0mm	74.12
R33	1	Motormount	Plywood 1,5mm	74.18
R34	1	Screw	Nylon M3 x 20	Small parts
L1	2	Joiner	Plywood 1,5mm	74.18
L2	2	Elevator	Balsa 3,0mm	74.15
L3	1	Horizontal stab	Balsa 3,0mm	74.15
L4	1	Vertical stab/ Fin	Balsa 3,0mm	74.16
L5	1	Rudder	Balsa 3,0mm	74.16
L6	2	Elevator and Rudder horn	CF 1,0mm	Small parts

## Building instructions

Thank you for choosing a quality product MADE IN GERMANY.

Please read these building instructions and suggestions prior to construction, then carefully proceed with the step by step construction.

### Intended Use

This glider is supplied as a kit. This must be assembled by you first before you can use it. This glider is only suitable for slope and thermal flying in calm weather.

### To proceed with this kit you accept,

- that you read, understand and follow the building instructions carefully.
- in particular, follow the safety instructions in the building instructions and pay attention to the manufacturers operating instructions and installation procedures.
- that you use this glider within the operating conditions specified in the building instructions and follow the manufacturers operating instructions.

### Inappropriate use

Modifying the kit beyond its intended use,

Or flying the model differently than described in this manual.

### Warning!

**DO NOT FLY AT HIGH SPEEDS.** At high altitude it is hard to judge the wind and the flight speed.

**Note!** The manufacturer is not liable for damage caused by improper use.

## General safety instructions

Please read the following instructions carefully. If you cannot follow these instructions, this will jeopardize your own safety and the people around you.

This kit is suitable for children over 14 years of age. Construction and operation under supervision of adults.

### To build the model

- While building the model, follow all safety regulations when handling tools and adhesives.
- Observe the safety instructions in the assembly instructions.
- Only use adhesives or similar adhesives specified by the manufacturer which have the same properties.
- Use the installation components specified by the manufacturer, or those specified with same technical data.
- Follow the safety instructions of the components of other manufacturers.
- All enclosed documents are an integral part of this kit.

When selling the flight model, pass on all accompanying documents with the kit.

### To operate the model

- The operation of flight models of this kind requires a model flight liability insurance.
- Do not operate the model in unfavorable weather (thunderstorm, strong wind etc.)  
Do not fly near high voltage lines.
- Do not operate the model if it is damaged, or any components are damaged.

This manual is part of the product. If you pass on the product to a third party, please also include the building instructions.

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