robbe
Modellsport

VAYU

Version No.: 2695

INSTRUCTIONS AND USER MANUAL

www.robbe.com

V1_06/2023

PREFACE

Dear model builder,

You have chosen the VAYU kit from our company. For this we would like to thank you very much.
The VAYU is a flying wing with a wide range of use. The VAYU is delivered as a kit. The laser-cut wooden parts will be assembled and glued with only a few steps in the plug-in box principle. Please read these instructions carefully, even if you have already built many RC models. We have given a lot of thought to detail solutions in order to keep the construction effort as simple and low as possible without neglecting the functionality.
The kit is manufactured with modern CNC technology. This gives you the certainty that you will not experience any unpleasant surprises due to mismatched components when building the VAYU.
Now we wish you a lot of fun building your new VAYU and especially flying it afterwards.

PLEASE READ THIS MANUAL CAREFULLY BEFORE YOU START ASSEMBLING THE MODEL.

FLIGHT INSTRUCTIONS

- Before the first flight, observe the instructions in the „Safety Instructions“ section.
- When flying the model, you should choose a day with as little wind as possible
- A large, flat area without obstacles (trees, fences power lines etc.) is suitable for the first flights.
- Please carry out a functional test of the drive train / power set and remote control.
- After assembling the model on the airfield, check once again that all model components such as wing, tail units, wing mounts, engine, linkages, etc. are firmly and properly fastened.
- For a hand start a helper should be present, who can throw the model with enough thrust into the air.
- The start usually takes place against the wind.
- Do not stall the model near the ground
- Do not initiate tight turns in the immediate vicinity of the ground.
- Check the reactions of the model to the rudder deflections. If necessary, adjust after landing to increase or decrease the deflections accordingly.
- The minimum flight speed must be at an adequate safety altitude.
- Initiate the landing with sufficient speed

SAFETY NOTE FOR MODEL OPERATION

Attention, danger of injury!
- Always keep a safe distance from your model aircraft.
- Never fly over spectators, other pilots or yourself.
- Always perform flight figures in a direction away from the pilot or spectators.
- Never endanger people or animals.
- Never fly near power lines or residential areas.
- Do not operate your model near locks or public shipping.
- Do not operate your model on public roads, motorways, paths and squares, etc., but only in approved locations.
- Do not operate the model in thunderstorms.
- Before each flight, check your remote control system for sufficient function and range.
- After flying, remove all batteries from the model.

Do not „aim“ the transmitter antenna at the model during operation. In this direction, the transmitter has the lowest radiation. The best position of the antenna is to the side of the model.
Use of devices with image and/or sound recording function:
If you equip your model with a video or image recording device (e.g. FPV cameras, action scams etc.) or the model is already equipped with such a device at the factory, please note that you could violate the privacy of one or more persons by using the recording function. An overflight or driving on private ground without the appropriate permission of the owner or approaching private ground can also be regarded as an invasion of privacy. You, as the operator of the model, are solely and fully responsible for your actions.
In particular, all applicable legal requirements must be observed, which can be found in the roof associations or the relevant authorities. Failure to comply can result in substantial penalties.

GENERAL SAFETY INFORMATION

- Be sure to read the safety instructions carefully before operating your model.
- Always follow the procedures and settings recommended in the instructions.
- If you are using remote-controlled model aircraft, helicopters, cars or ships for the first time, we recommend that you ask an experienced model pilot for help.
- Remote-controlled models are not toys in the usual sense and may only be used and operated by young people under 14 years of age under the supervision of adults.
- Their construction and operation requires technical understanding, careful craftsmanship and safety-conscious behaviour.
- Mistakes or negligence during construction, flying or driving can result in considerable damage to property or personal injury.
- Since the manufacturer and seller have no influence on the proper construction/assembly and operation of the models, these risks are expressly pointed out and any liability is excluded.
- Propellers on aircraft and all moving parts in general pose a constant risk of injury. Avoid touching such parts at all costs.
- Note that motors and controllers can reach high temperatures during operation. Avoid touching such parts at all costs.
- Never stay in the danger area of rotating parts with electric motors with connected drive battery.
- Overcharging or incorrect charging can cause the batteries to explode. Make sure the polarity is correct.
- Protect your equipment and Models from dust, dirt and moisture. Do not expose the equipment to excessive heat, cold or vibration.
- Use only recommended chargers and charge your batteries only up to the specified charging time. Always check your equipment for damage and replace defects with original spare parts.
- Do not use equipment that has been damaged or got wet due to a fall, even if it is dry again! Either have it checked by your specialist dealer or in the Robbe Service or have it replaced. Hidden faults can occur due to wetness or a crash, which lead to a functional failure after a short operating time.
- Only the components and accessories recommended by us may be used.
- Do not make any changes to the remote control which are not described in these instructions.

GENERAL INFORMATION

- The model is designed for the components specified by us. Unless otherwise stated, servos and other electronic components are designed for standard supply voltage. Recommended cell count for Lipo batteries also refers to standard Lipos voltage of 3.7V per cell. If you use other servos, a different motor and controller, batteries, or propellers, please make sure they fit first. In the event of deviations, corrections and adjustments must be made by yourself.
- Before starting construction, always put the servos into neutral. To do this, switch on the remote control and move the joysticks and trim buttons (save the one for the throttle) to the middle position. Connect the servos to the corresponding outputs of the receiver and supply them with a suitable power source. Please observe the connection diagram and the operating instructions of the remote control system manufacturer.
- Do not leave your model in the blazing sun or in your vehicle for long periods of time. Too high temperatures can lead to deformation/distortion of plastic parts or blistering of covering foils.
- Before the first flight, check the wing symmetry, tail unit and fuselage. All parts of the model should have the same spacing from the left and right wing or tail plane to the centre of the fuselage or the same angle.
- If necessary, rebalance the propellers if vibrations are noticeable when the motor is running up.
- Bubble formation in the covering foils normal to a certain extent due to temperature and humidity differences and can be easily eliminated with a foil iron or hairdryer.
- For models in shell construction („full GFRP/CFRP“), burrs may occur at the seams due to the production process. Carefully remove them with fine sandpaper or a file.

SAFETY INSTRUCTIONS FOR CONTROLLERS

- Observe the technical data of the controller.
- Observe the polarity of all connection cables.
- Avoid short circuits at all costs.
- Install or package the regulator so that it cannot come into contact with grease, oil or water.
- Effective interference suppression measures on the electric motor with, for example, interference suppression capacitors
- Ensure adequate air circulation.
- Never reach into the turning circle of the propeller during start-up Risk of injury

Dealing with model aircraft and vehicles requires technical understanding and a high level of safety awareness. Incorrect assembly, incorrect adjustment, improper use or the like can lead to personal injury or damage to property. Sudden starting of connected motors can lead to injuries due to rotating parts such as propellers. Always stay away from these rotating parts when the power source is connected. All drive components should be safely and securely mounted during a function test. Use is only permitted within the scope of the technical specification and only for RC hobby applications. Before use, check that the speed controller is compatible with your drive motor or power source. Never operate the speed controller (correct speed controller) with external power supply units. Speed controllers should always be protected from dust, moisture, vibration and other mechanical stresses. Even splash-proof or waterproof equipment should not be permanently exposed to moisture or moisture. High operating temperatures or poor cooling should be avoided. The recommended temperature range should be approximately between -5°C and +50°C. Ensure proper connection and do not cause reverse polarity which would permanently damage the speed controller. Never disconnect the device from the motor or battery during operation. Use high-quality plug systems with sufficient load capacity. Avoid strong bending or tensile stress on the connecting cables. After termination of flight or driving operation, disconnect the battery to prevent deep discharge of the battery. This would cause permanent damage. For the BEC version of the controller, check that the BEC power of the device is sufficient for the servos used. Speed controllers should be installed as far away as possible from other remote control components. We recommend carrying out a range test before operation. We recommend regular checking of the controller for function and externally visible damage. Do not continue operating the controller if you notice any damage. The connection cables must not be extended. This can lead to unwanted malfunctions. Despite existing safety and protective devices of the device, damage may occur which is not covered by warranty. The warranty also expires if changes are made to the device.

Important information:
The receiver system is powered by the built-in BEC system of the controller.
For commissioning, always move the throttle stick to the „Motor off" position and switch on the transmitter. Only then connect the battery. To switch off always disconnect the connection battery motor controller, first then turn off the transmitter. During the functional test, move the servos of the rudders to neutral position with the remote control (stick and trimming lever on the transmitter to the middle position). Please make sure to leave the throttle stick in the lowest position so that the engine does not start. For all work on to the parts of the remote control, motor or controller, follow the instructions supplied with the units. Also read the instructions of the battery and the charger carefully before commissioning. Check the engine mounting bolts in the fuselage regularly for tightness.

INSURANCE

Ground-based models are usually covered by personal liability insurance. Additional insurance or extension is required for aircraft models. Check your insurance policy (private liability) and take out suitable insurance if necessary.

DISPOSAL

The sign of a crossed-out dustbin means that the product is not allowed to be disposed of with normal household waste due to certain ingredients. Dispose of the device at your local municipal collection point or recycling centre. This applies to all countries of the European Union and other European countries with a separate collection system.

SAFETY INSTRUCTIONS FOR RECHARGEABLE BATTERIES

- Do not immerse the battery in water or other liquids.
- Do not heat, throw into fire or microwave.
- Do not short-circuit or charge with reversed polarity
- Do not expose, deform or throw the battery
- Do not solder directly on the battery
- Do not change or open the battery
- Only charge the battery with suitable chargers, never connect it directly to a power supply unit.
- Never charge or discharge the battery or charger on a flammable surface.
- Never leave the battery unattended during charging or discharging processes.
- Never charge or discharge the battery in direct sunlight or near heaters or fire.
- Do not use the battery in places subject to high static discharge.

All this can cause the battery to be damaged, explode or even catch fire!

- Keep the battery away from children
- Keep leaked electrolyte away from fire, as it is highly flammable and may ignite.
- The electrolyte liquid should not get into the eyes, if it does, rinse immediately with plenty of clear water and then see a doctor.
- The electrolyte liquid can also escape from clothes and other objects with a lot of water or washed off.
- Observe the safety instructions of the battery manufacturer and the charger manufacturer.

WARRANTY

Our articles are equipped with the legally required 24 months warranty. Should you wish to assert a justified warranty claim, always contact your dealer, who is responsible for the warranty and the processing. During this time, any functional defects that may occur, as well as manufacturing or other problems, will be rectified.
Material defects corrected by us free of charge. Further claims, e.g. for consequential damages, are excluded.
The transport to us must be free, the return transport to you is also free. Freight collect shipments cannot be accepted. We cannot accept liability for transport damage and loss of your consignment. We recommend appropriate insurance.

To process your warranty claims, the following requirements must be met:

- Attach the proof of purchase (receipt) to your shipment.
- The units have been operated in accordance with the operating instructions.
- Only recommended power sources and original robbe accessories have been used.
- There is no moisture damage, external interference, reverse polarity, overloading or mechanical damage.
- Attach relevant information for finding the fault or defect.

DISCLAIMER

Robbe Modellsport cannot monitor compliance with the assembly and operating instructions or the conditions and methods for installation, operation, use and maintenance of the model components.Therefore, we accept no liability for losses, damage or costs arising from or in any way connected with incorrect use and operation.To the extent permitted by law, the obligation to pay damages, irrespective of the legal grounds, shall be limited directly to the invoice value of the claims arising from the event causing the damage.

CONFORMITY

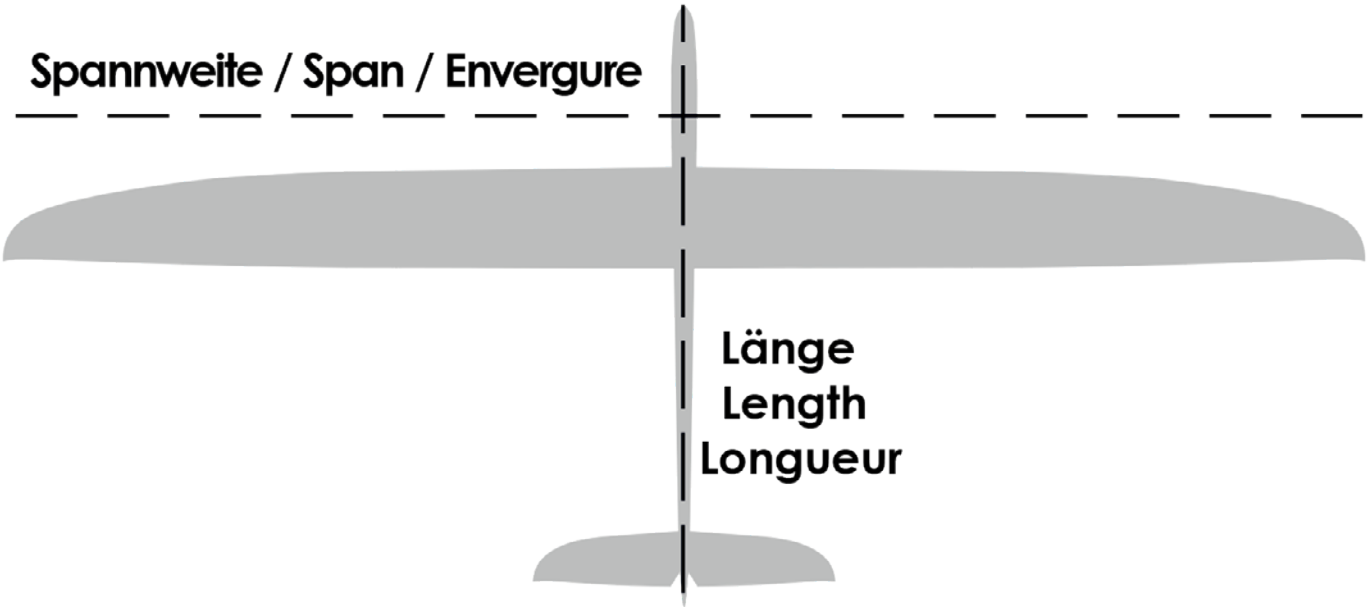
CE

Robbe Modellsport hereby declares that this device complies with the essential requirements and other relevant regulations of the corresponding CE directives. The original declaration of conformity can be found on the Internet at www.robbe.com, in the detailed product view of the respective device description or on request. This product can be operated in all EU countries.

BOX CONTENT - NEEDED ACCESSORIES

	No.	Accessories needed	LF: KIT
Battery	9788328	1x 2S Lipo 1000mah „SLIM“	-
Servo AILE + ELE	9123	2x Robbe FS 166 BB MG DIGITAL	-
Adhesives	5019	SPEED Cyanoacrylate Adhesive Glue Set 3-piece	-
Epoxy resin	50601	5min ro-POXY 200g Resin adhesive	-
Other	-	1x Wood glue	-
Other	-	1x Covering material	-
TX	-	with delta mixer	-
RX	-	min. 2 channels	-
Declaration:	**LF: Box content**	**-: not included**	**X: included**

TECHNICAL DATA



Span	1300 mm
Length	-
Weight (dry) approx.	-
Flying weight approx. from	700 g
Wing Area	23,36 dm²
Airfoil	7,5 %
Wing loading from	30 – 35 g/dm²
Flight Skill	Advanced
C.G.	52 mm from the leading edge

Elevator	yes
Rudder	no
Ailerons	yes
Flaps	no
Motor	no

GENERAL INFORMATION

The assembly of the VAYU can be done quickly and easily thanks to CNC-lasered and thus accurately fitting components. With the help of these building instructions, the VAYU can be built without any problems even without a building plan, the construction is quick and can be realized even for inexperienced model builders in a few evenings. Take some time to study these building instructions carefully before you start assembling.
Assembly is done on a template made of poplar plywood using the plug-in box principle. The design allows the wing, including the bottom and top planking and the end rails, to be assembled in one go. This makes wing warping almost impossible! The VAYU has transport-friendly dimensions, a Quick Connect wing lock with Easy Power ON/OFF function, an integrated hook and a ballasting option (optional ballast box # 26950002).

INTRODUCTION

Recommended rc-equipment:
- Transmitter with programmable delta mixer and dual rate
- Micro receiver with normal range, maximum front size 25 x 9 mm
- Sub-Micro Servos, Width 9mm, ROBBE FS 166 HV # 9123
- Receiver battery, 2S Lipo 1000mah „SLIM“ 20x12x105mm # 9788328

Required tools:
- Building board, e.g. blockboard 30 x 80 cm, taped with parcel tape
- Sharp cutter knife
- Sandpaper grit 100 and 240
- Grinding lath, e.g. aluminum angle profile 50 x 30 mm
- Superglue (CA-glue) „Speed“ (low and middle viscosity) # 5062 / 5063
- Activatorspray # 5017
- Glue holder # 50610
- PVA glue (White glue)
- Epoxy adhesive, e.g. UHU Endfest Plus
- Clamps, weights for weighting
- Masking tape
- Soldering iron, solder
- Hot air gun (or similar for the heat shrink tubing)
- Key files (flat, square 3mm)
- Pliers
- Right Angle
- Torx 6, Torx 10
- Rudder deflection indicator # 50611
-

Required materials:
- Film for covering, approx. 140 cm
- Lead granules nickel plated, ball diameter 1 mm to 3 mm, approx. 100 g *
- Rolled lead, approx. 100 g *

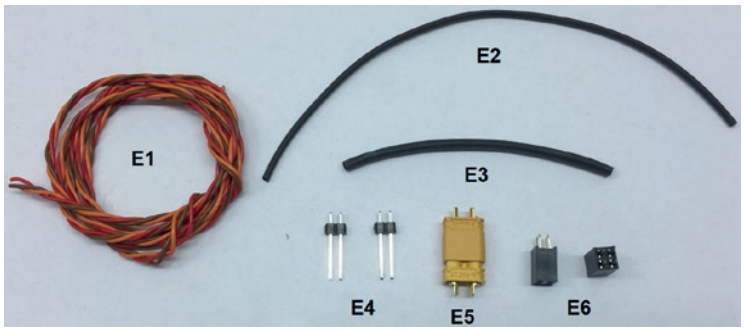
(* not required when using the accessories listed below)

Accessories:

26950002	Ballast box for VAYU including ballast weights
26950001	Cast trim weight for VAYU (for fuselage nose)

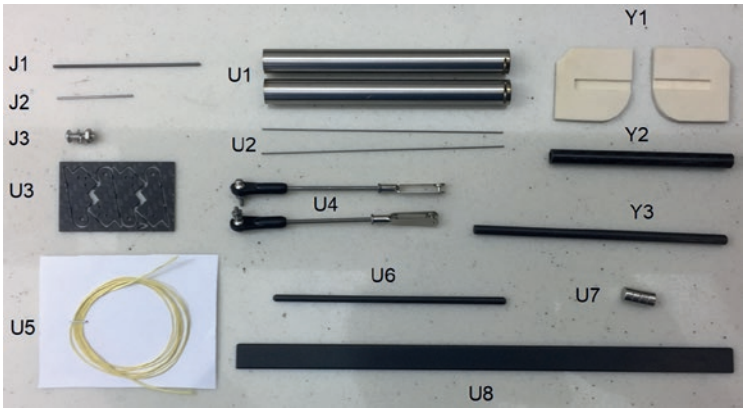
Kit contents

1	Right slipway / ribs	Poplar 3 mm
2	Right ribs	Poplar 3 mm
3	Left slipway / ribs	Poplar 3 mm
4	Left ribs	Poplar 3 mm
5	Ribs 2a /2b	Plywood 3 mm
6	Servo mount etc.	Plywood mm
7	Edging strip bottom (Sandwich)	Balsa 2 mm
8	Edging strip top (Sandwich)	Balsa 6 mm
9	Rudder (Sandwich)	Balsa 3 mm
10	Intro-Leading edge	Balsa 2 mm
11	Leading edge / Rudder / Edging strip	Plywood 1 mm
12	Flap stays	Balsa 5 mm
13	Planking D-Box right	Plywood 0,4 mm
14	Planking flaps right	Plywood 0,4 mm
15	Planking D-Box left	Plywood 0,4 mm
16	Planking flaps left	Plywood 0,4 mm
17	Planking middle wing / doubling	Plywood 0,4 mm
VMR	GFK Center rib	GFRP
L1	CFRP rectangle profile 0,6 mm x 5 mm (650 mm)	4 pcs, CFRP
L2	CFRP rectangle profile 0,6 mm x 5 mm (120 mm)	4 pcs, CFRP
L3	Wooden profile bar5 x 10 mm (600 mm)	2 pcs, Lime



Bag of small electric parts:

E1	Servo cable 0,14 m²	750 mm
E2	Heat shrink tube 1,6 / 0,8 mm	150 mm
E3	Heat shrink tube 2,4 / 1,2 mm	70 mm
E4	Pin bar, 2 Pin, 17 mm	2 pieces
E5	Socket, 4 Pin	2 pieces
E6	XT30 Plug / Socket	1 pair



Bag of small parts:

J1	Spring steel 1,2 mm (60 mm) ~ Wing lock	Steel
J2	Spring steel 0,8 mm (30 mm) ~ Hook	Steel
J3	Stainless Steel Screw M3 x 10 / Clip / Locknut	Steel
U1	Stainless Steel Pipe 10 x 0,3 mm (95 mm)	2 pcs, Steel
U2	Spring steel 0,6 mm (100 mm)	2 pcs, Steel
U3	Carbon Rudder Horn (milled part)	4 pcs, Carbon
U4	Ball joint M2	2pcs,Injection moulding
	Threaded rod M2 Stainless steel (50 mm)	2 pcs, Steel
	Stainless Steel Screw M2 x 10 / Clip / Locknut	2 pcs, Steel
	Clevis	2 pcs Steel
U5	Kevlar cord (1 Meter)	Kevlar
U6	Carbon round bar 3 mm (80 mm)	Carbon
U7	Magnete 6 x 3 mm	Magnet
U8	Carbon rectangle profile 10 x 2 mm (200 mm)	Carbon
Y1	Rudder mount (milled part)	Poplar
Y2	Carbon tube wound 6/4 (70 mm)	Carbon
Y3	Carbon round bar 4 mm (100 mm)	Carbon

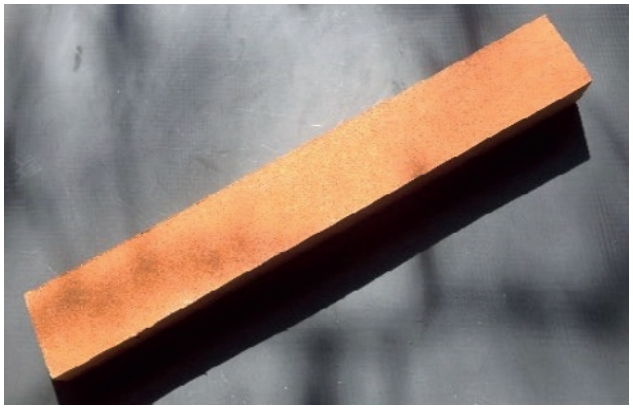
INFO CAUTION! **Carry out this work with care, as it is essential for safe operation at a later date. Incorrect installation can lead to personal injury and damage to property.**

3.1 REMOVING TRACES OF POWDER

Particularly on the plywood boards, traces of powder result during laser cutting. These are a bit unlovely but can easily be removed for the most part by sanding the surface. To do this, leave all components in the boards.
You should not regrind the cut edges so that the accuracy of fit is maintained. Instead, you can use a soft brush (e.g. toothbrush) to remove the burn-off at the cut edges.

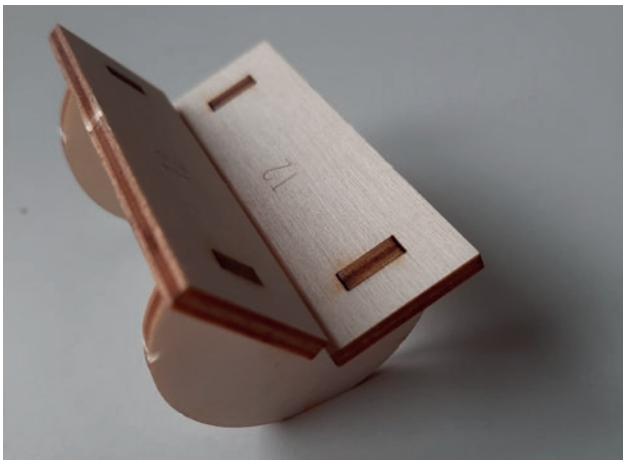
3.2 SLIDER BAR

You will need a sheet of 180 or 240 grit sandpaper and a rectangular squared timber, which should be about 200 to 250 mm long. Instead of the squared timber, you can also use a right-angled L-shaped aluminum profile. The leg length should be e.g. 30 mm to 50 mm.
You will need the slider bar later for sanding the contour of the leading edge strip as well as for sanding over the wings before applying the covering.
Glue the sandpaper to the squared lumber with PVA glue (white glue) and press it onto a flat surface until it is completely dry. After the PVA glue has dried, cut off any protruding sandpaper with a sharp cutter. If you use an aluminum profile, you can stick the sandpaper on with double-sided adhesive tape; this makes it easy to change the sandpaper. We recommend the use of an aluminum profile.



3.3 SANDING GAUGE

You will need the sanding gauge later to sand the flap stays on the two wing halves.
Separate the four individual parts (2 x T1, 2 x T2) of the sanding gauge from the plywood board with the cutter and plaster them.
Now plug the components together as shown on the right and glue them with superglue.
The sanding gauge is designed so that you can slide the sandpaper on one side under the other contact surface. Stick the sandpaper onto this side with double-sided adhesive tape. Cut off any protruding sandpaper with a sharp cutter.

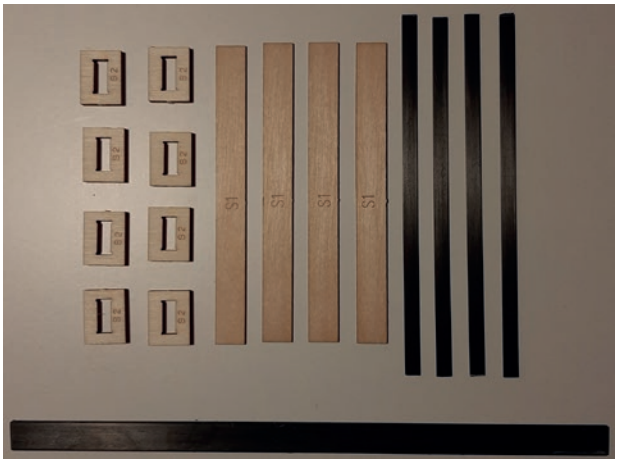


3.4 PLUG-IN BOXES

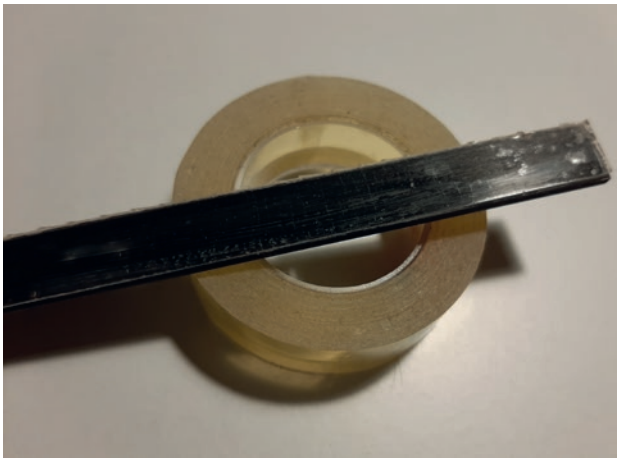
Use a cutter knife to separate the four components S1 from the plywood board and plaster them. Separate the eight components S2 from the poplar plywood boards as well.

Remove the four CFRP strips L2 from the strip bundle. Grind both sides of the strips well.

Take the CFRP plug-in rod from the plastic bag.

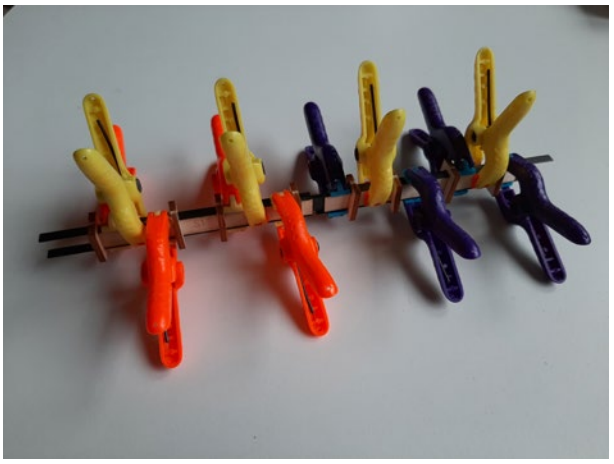


Apply a layer of adhesive tape to one side of the CFRP connecting rod. This prevents that the connection sits too tight later.
Now take the two parts S1, the CFRP plug-in rod and two CFRP strips L2 and assemble these parts without gluing to form a plug-in box.
Hold this package together with your fingers. Now test whether the 8 components S2 can be pushed over the connector box without any problems. If this is only possible with a lot of strength, you can minimally widen the recess with a very fine file. The S2 components should sit firmly on the junction box and must not have any space to move.



Note: To reduce the risk that the junction box and CFRP jumper rod stick together, apply a thin layer of Vaseline to the jumper rod before carrying out the following steps. However, make sure that no Vaseline gets onto the glued areas. Fixing the components is also possible with hot glue.

Now take two S1 components and place them flush on top of each other. Apply a thin layer of epoxy resin adhesive to the two long sides. Remove any excess adhesive. Make sure that no adhesive gets between the components.



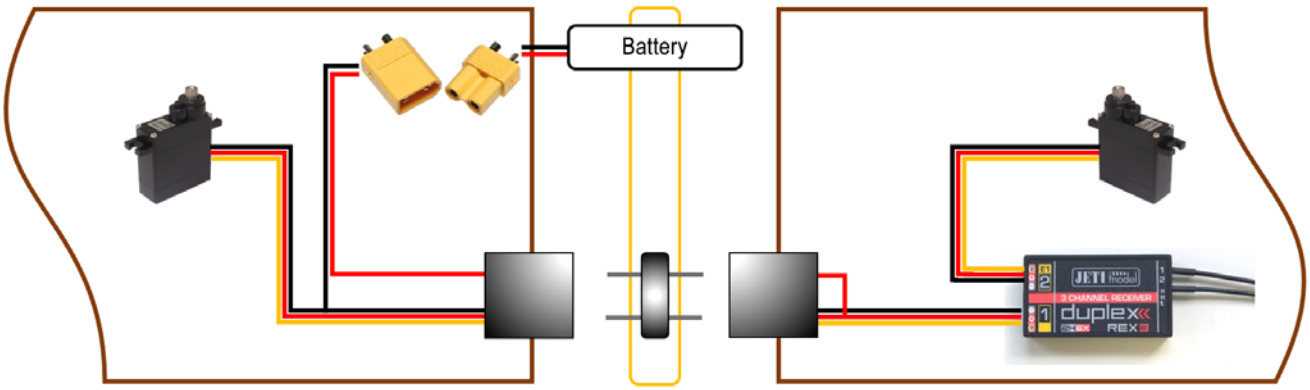
Now place the CFRP connecting rod between the two components S1.
Place a CFRP strip L2 on the top and bottom of this package.
Now slide four components S2 over the connector box and fix the package with clamps.
The components S2 will not be glued!
After the adhesive has cured, remove the clamps and the S2 components from the connector box.
Pull the CFRP connector rod out of the connector box.

Cut off the overhang of the CFRP strips L2 and sand one side of the connector box flat at the opening for the connector. You do not need to grind the sides.

Check with rib 2 whether the connector box can be pushed through the rib without any problems. You can carefully remove any adhesive that has swelled up.
Now make the second connection box accordingly. In principle, you can also make both connector boxes at the same time, but we recommend doing this one after the other. If the connector box is very difficult to detach from the connector rod, it is easier to work on it.

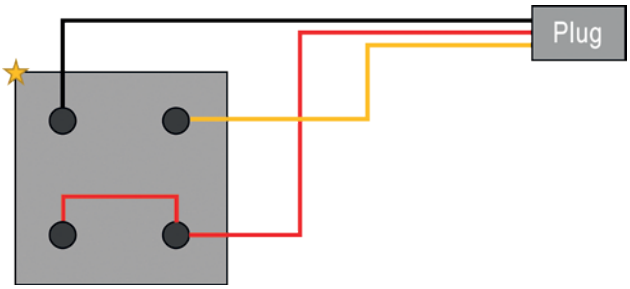
3.5 WIRING

The two four-pin sockets and the pin tracks are used to connect the left servo and the battery to the right wing half. The receiver is located in the right wing half. When the wing halves are plugged together, the receiver is supplied with power through the contact in the center rib.
You need to wire a left and a right socket.



3.5.1 RIGHT SOCKET

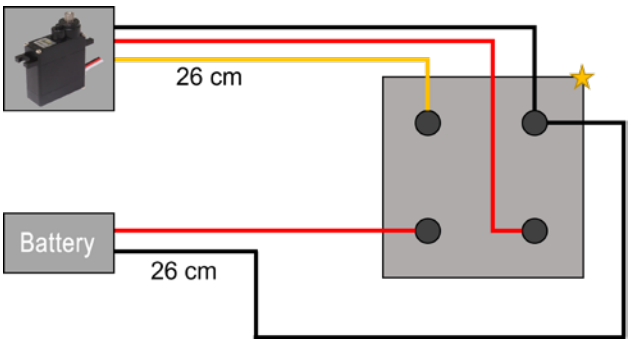
Cut an approx. 10 cm long piece of the servo cable from a servo. Solder this servo cable with the plug onto the socket. Before you solder the cable, thread three pieces of heat shrink tubing over the cables. For the ground (black) and the signal cable (white and orange respectively) the thin heat shrink tubing is provided. For the positive (red) wire, use the thicker heat shrink tubing. The two plus pins must be connected to each other. Take a close look at the socket for this, the solder contacts can be easily bent in one direction. Bend the two plus contacts minimally to each other so that you can solder the plus cable more easily to both contacts together. After all contacts have been soldered, the individual pins can be secured with hot glue to prevent them from being accidentally pushed out.



3.5.2 LEFT SOCKET

If you solder the left socket, you must make sure that the assignment of the contacts is corresponding to the right side. In the two graphics the corners with the ground wire are marked with a star for this reason.

For the servo, solder on an approx. 26 cm long three-core cable. For the battery use the enclosed servo cable and remove the orange cable. It must also be approx. 26 cm long. The soldered joints are insulated with heat shrink tubing. For the two black cables, a piece of the thicker heat shrink tubing is used together.

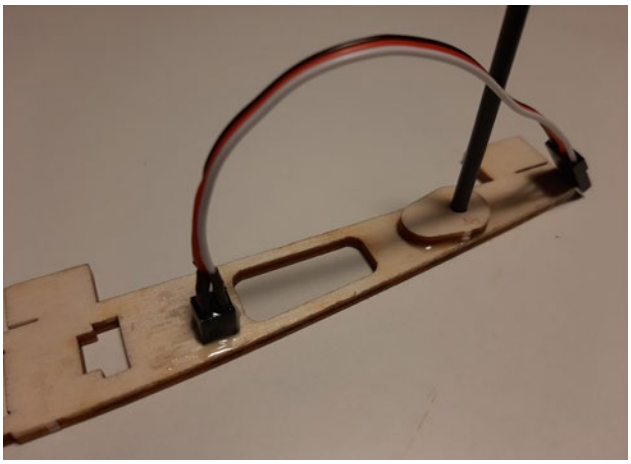


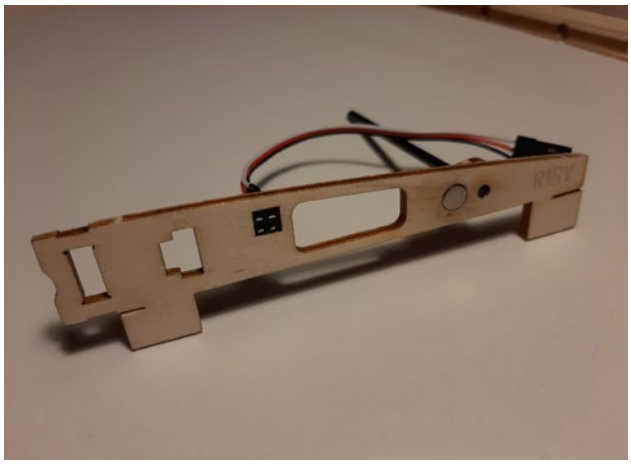
3.6 ROOT RIB

Note: The root ribs of the left and right sides are different.
The buildup is different and must be performed with the correct side in any case.

3.6.1 RIGHT ROOT RIB

Lay out the right root rib 1R, the socket for the right side (with plug), a magnet and the cover of the magnet. Check that everything can be mounted in the root rib.
Roughly grind the side of the magnet and degrease it.





Glue the bushing and the magnet into the rib with epoxy glue. To do this, apply a thin layer of glue to the gluing surface in the rib and to the sides of the bushing and magnet. Press the bushing and magnet into the rib from the inside of the wing. Note which orientation the bushing is in the rib, e.g., ground bottom to back. The bushing and magnet must be flush with the outside of the rib. Carefully wipe off any glue that has oozed out. Make sure that no glue gets into the bushing. Tape the outside with a strip of adhesive tape. Now lay the rib flat on the building board and press the magnet, the bushing and the rib itself firmly onto the building board so that everything is really flush. For the bushing, be careful not to get it stuck at an angle by the cable. Coat the cover of the magnet with epoxy glue as well and place the cover over the magnet. Use a 3 mm pin (e.g. drill) to align the hole of the rib and the cover. Make sure that the pin does not stick. To do this, apply a thin layer of Vaseline to the pin. Make sure that the cover lies flat on the rib and that there is no gap.

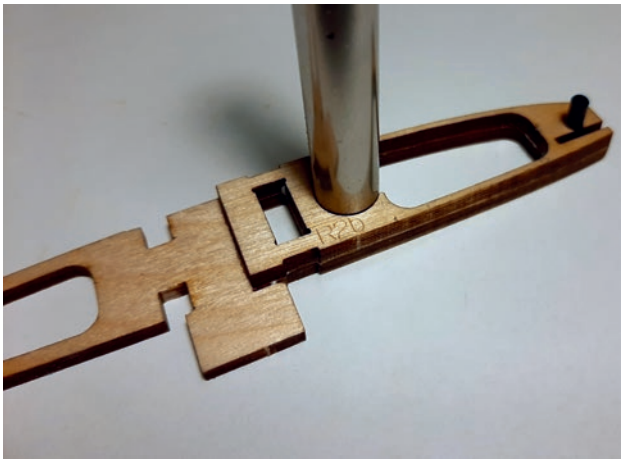
3.6.2 LEFT ROOT RIBS

For the left root rib, proceed accordingly to the right side.
Make sure that you mount everything from the inside of the wing again. The cable to the battery and the servo is soldered to the left socket. When gluing in the socket, be sure to use the same orientation as on the right side. E.g. ground down to the rear.
Before gluing in the magnet, determine the orientation in which it is attracted by the magnet of the right root rib. Glue the magnet in this orientation. The two root ribs must attract each other and must not repel each other.

3.7 RIB DOUBLING RIB 2

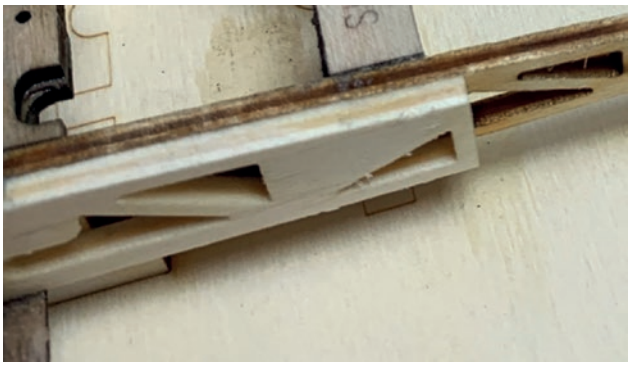
Note: The rib 2 of the left and right side differ.
The build-up is different and must be performed with the correct side in any case.

Lay out the left and right rib 2 and the corresponding doubler. Glue the doubler to the inside of rib 2 using white glue. To align the parts to each other, you can use the steel tube of the ballast chamber and a 3 mm pin.



3.8 RIB DOUBLING R7 / R8

Glue a rib doubler to each of the ribs 7 and 8. These doublers are needed to glue the lower planking to the servo. The doubler is glued to the side of the rib facing away from the servo. The doubler of rib 7 is on the side of rib 6 and the doubler of rib 8 is on the side of rib 9.



3.9 INTRO LEADING EDGE

Press the two parts of the Intro leading edge together. This fit is designed to be very tight so that the contour of the leading edge becomes correct. If in doubt, take a flat hard object to press the parts together.

Make sure that both parts have been pressed completely into each other and are not slanted or twisted. Tape one side with a strip of adhesive tape and glue the two parts together with thin super glue.
The intro leading edge of the second wing is assembled accordingly.

3.10 SPAR BAR

Assemble the two spar bars from the two parts respectively. Fix the two parts at the joint with a strip of adhesive film and glue them together with thin super glue.

3.11 BALLAST CHAMBER – LOCKING DEVICE

The ballast chamber is installed on the left and right directly in front of the spar in the wing. Even if you do not want to use ballast weights, the two ballast chambers should be installed. A later upgrade is not possible.

By inserting the ballast pieces, the center of gravity is shifted minimally forward, which has proven to be ideal in flight tests.

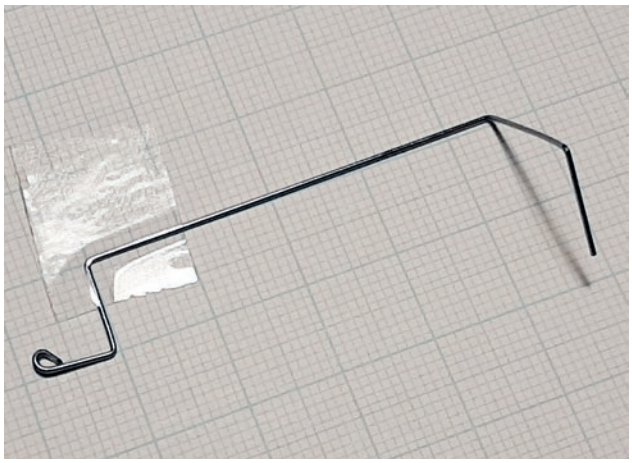
The ballast chamber is locked with a spring wire. Thus, the weights can be loaded and removed again very easily.

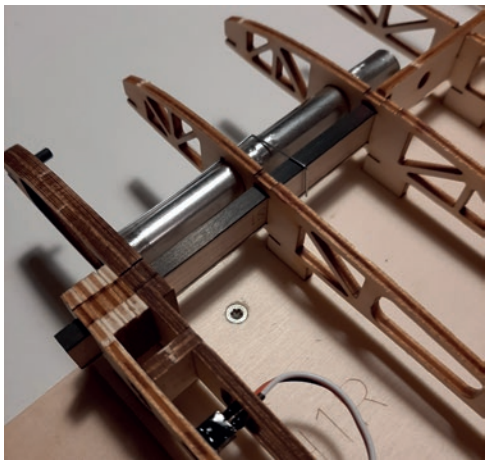
Note: You will need a left and a right spring for the two ballast chambers.

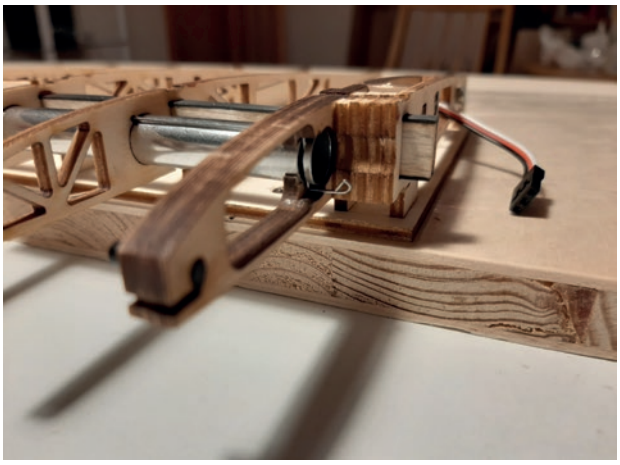
For the locking spring, two 0.6 mm wires are included in the kit.

Process the wire in the following order:

- Bend a tab at the beginning of the wire.
- Approx. 5mm behind the tab you have to bend a 90° angle.
- Insert the wire into the slot of the stainless steel tube and take off the length of the slot (approx. 10mm).
- Bend the wire 90° in the same level in the opposite direction to the first angle.
- 45mm further, a 90° angle will be bent, which should protrude approx. 45° out of the plane. This bend direction depends on the side. The picture shows the spring for the right side. For the left side you lay the wire left/right swap ped on the building board and then bend accordingly.
  If you are unsure, you can also make this angle later, when the wing is built up enough to insert the wire.
- After 16-17mm follows a 90° angle downwards.
- You can shorten the last wire section to approx. 10 mm.







3.12 BALLAST CHAMBER – CLOSING PLUG

Grind the ballast chamber in the rear area on the inside and degrease this area.
Insert the closing plug with epoxy glue and push the wooden component into the tube so that it sits about 1 mm inside.

Grease a brass ballast piece with Vaseline and push it into the tube from the front. Insert two more ballast pieces into the tube. Carefully push the three ballast pieces backwards until you can insert the wire into the locking slot at the front.

Here, the closing plug should be pushed outwards again minimally. Press slightly against the stopper so that the ballast pieces are firmly seated. They must not slip back and forth.

Remove the ballast pieces carefully without moving the plug and clean them.
If you have not ordered the optional ballast set, use a piece of wood 90mm long instead of the three brass ballast pieces.

3 PREPARATORY WORK KIT

3.13 SLIPWAY

Note: There is a left and a right slipway. You do not need to use the slipway again after finishing the first half of the wing.

Tape the building board with parcel tape so that you can easily remove the slipway from the building board later.

You can attach the slipway to the building board using several screws, staples or thin double-sided adhesive tape. Make sure that the slipway is completely flat.

The slipway is attached to the edge of the building board. This makes it easier for you later during some construction steps.

4 WING ASSEMBLY KIT

The following description refers primarily to the construction of the right half of the wing. Differences that must be taken into account when constructing the left half of the wing are described at the end of the chapter.

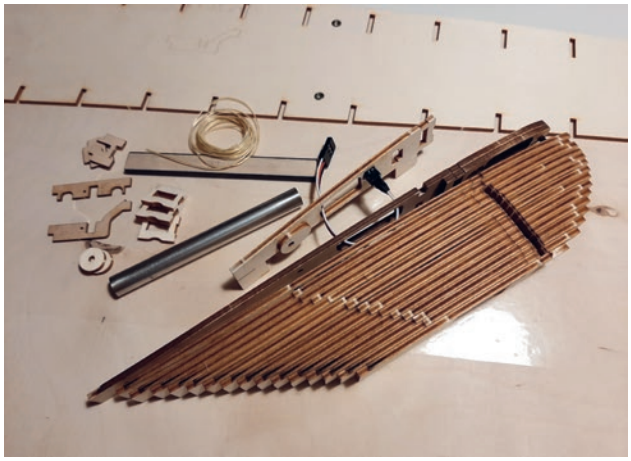
Note: Only glue parts together when it is described in the manual. Otherwise, you may not be able to build the model correctly.

Carefully separate the ribs of one half of the wing from the plywood boards with a cutter knife and sand the webs flat with sandpaper. Sort the ribs in order.

4.1 RIB 1 TO 4

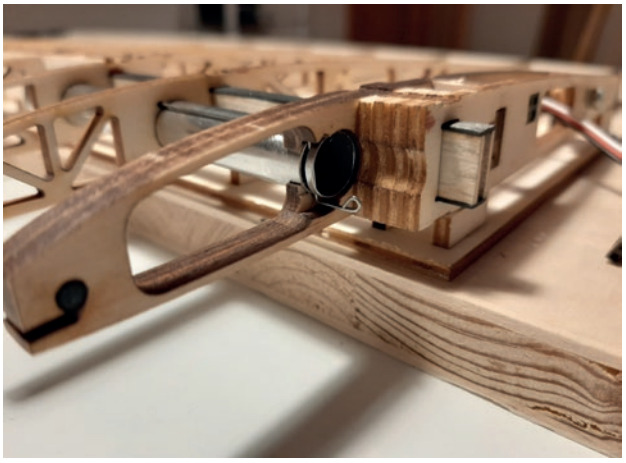
Prepare the ribs 1 to 4, a ballast tube, a connector box, the three parts of the front pressure bar, the two parts for fastening the wing ledger and the two parts of the rear pressure bar that have not yet been glued in place.

A few of the next ribs and the spar bar are helpful for aligning the first four ribs.



4 WING ASSEMBLY

KIT



Push the plug-in box through rib 1. Thread the three parts of the front pressure bar onto the plug-in box. The rounding points to the front, the lettering can be read correctly. The parts are asymmetrical and should be flush with the rib at the top and bottom.

Now rib 2 is pushed on. Leave a little more space.

Check if the surface ledger fits into the fastening and rework it if necessary. The wing ledger is glued in at a much later stage so that it is easier and more accurate to work on the planking etc. on rib 1.

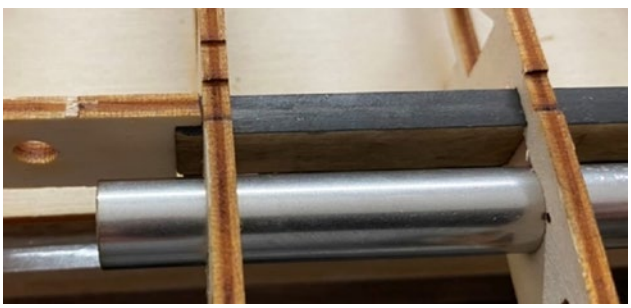
Insert the attachment of the wing ledger in rib 1. On the right wing, the cutout for the wing ledger is at the front, with the rounding of the „P“ pointing upwards. The labeling must be read the right way around. Before gluing, be sure to test whether the ledger fits into the cutout without any problems. Now you can still slightly rework.

Now the rear pressure bar between R1 and R2 can be threaded on with an M3 screw. The M3 screw can be secured with a nut. The screw head should be at R1 so that the screw can be removed later without any problems.

Insert the assembled parts and ribs 3 and 4 into the slipway.

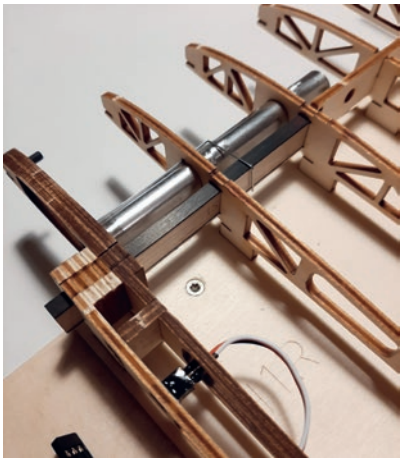
Push the connector box up to the rib 4.

Push the ballast tube from the wing tip into the ribs 4 to 2. The tube can only be pushed into the ribs in this direction, as the rounding of the front pressure bar has been adjusted to the inside of the ballast tube.



Temporarily press additional ribs into the slipway and place the spar bar on the ribs. Now you can push the connector box inward until it rests against the spar bar.

Check that the first four ribs have been pressed completely into the slipway and are exactly vertical. The rear foot of the rib must lie flat on the building board. It is important that rib 1 is absolutely vertical, otherwise there will be a gap to the GRP center rib. To check the angle of rib 1, place a piece of scrap wood next to the slipway so that you have a sufficiently large contact surface.



Note: The spar bar and the provisionally inserted ribs must not yet be glued in place. They are used only for the exact alignment of the first four ribs.

You can now fix the ribs 1 to 4 on the feet to the slipway with a drop of medium-viscosity super glue.
Check again that the first four ribs are really seated exactly. Now you can glue the connector box, the two pressure bars and the holder of the wing lock with thin super glue. Press the ribs 1 and 2 slightly together. The ballast tube should not be glued yet.

Remove the ballast tube, the spar bar and the temporary ribs again.
Divide the enclosed Kevlar thread approximately into two pieces of equal length.

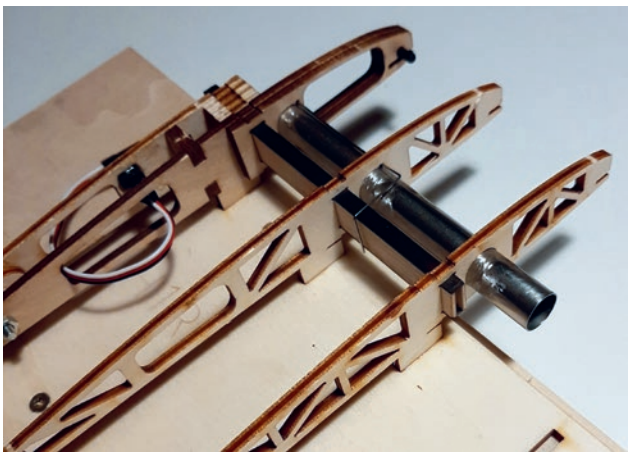
Glue the beginning of the Kevlar thread with superglue to the connector box at rib 4. Wait until the superglue is dry. Wrap the plug box between ribs 3 and 4 under tension. Make sure that the thread is always taut. Glue the end of the thread under tension onto the connector box. Now you can glue on the complete Kevlar thread with super glue.

4.2 INSERTING THE BALLAST TUBE

Grease the spring wire for locking the ballast tube with Vaseline and thread it through the ribs. Clip the wire into the small holes.

Roughen the ballast tube thoroughly in the area of the ribs and degrease it at these points. Push the tube through the ribs from the outside with the slot in the direction of rib 2. The slot in the tube must be at rib 2. The ballast tube touches the front pressure bar and ends with rib 2.

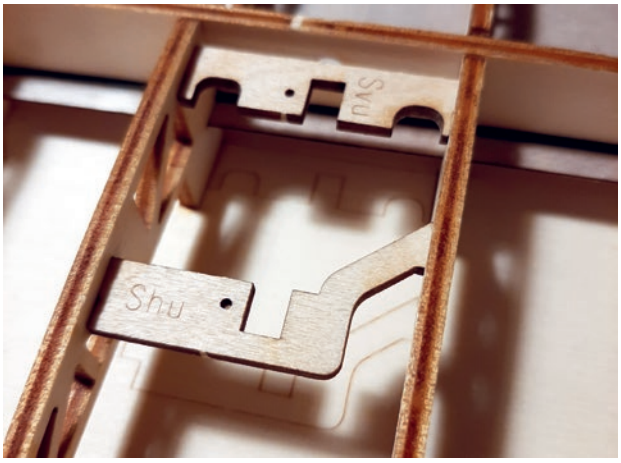
The tube is not glued until the bottom planking has been fitted, so that any adhesive that runs down does not reach the underside of the ribs.



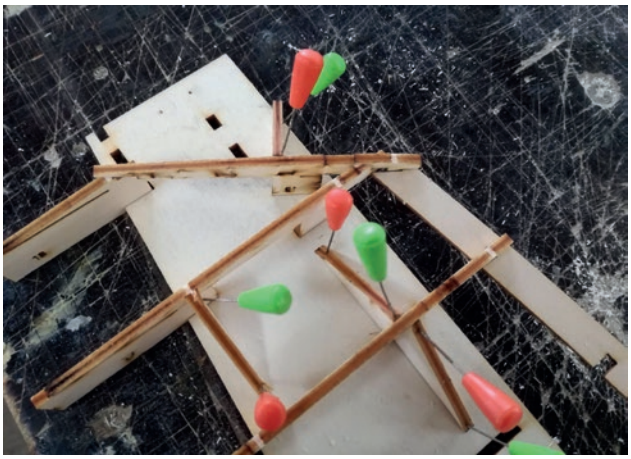
4.3 RIBS 5 - 19 AND LOWER FRONT PLANKING

Place the ribs 5 to 16 in the slipway. The servo frame is placed between ribs 7 and 8.

The servo frame consists of 4 parts. First, insert only the two lower parts Svu and Shu into the ribs. You can glue in the two top doublers later. The side with the drill hole for the servo mounting screw faces the root rib, the slanted side of Shu faces the wing tip.



Ribs 17 and 18 must be adapted to rib 19. To do this, insert the two ribs 17 and 18 into the slipway and fit rib 19 from above. Mark on ribs 17 and 18 at which angle the recess for the slanted rib must be adjusted. Edit the two ribs accordingly. Make sure that rib 19 can be inserted completely into the slipway and that the rib is not bent. It must also be exactly vertical.



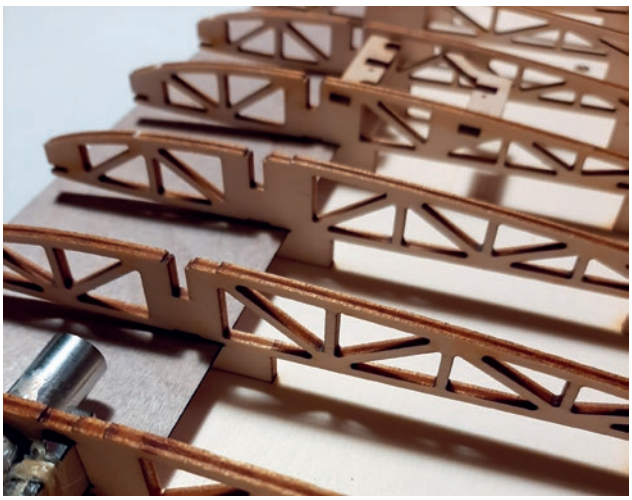
To make it easier to check whether rib 19 is completely inserted into the slipway, you can insert it into the slipway without the two ribs 17 and 18 and mark the intersection of the slipway and the foot with a sharp pencil.

Insert the glued intro nose strip into the ribs. Check that the front edge of the intronase strip is flush with all ribs. Rib 19 must also fit neatly, otherwise check again whether rib 19 is seated exactly. The intro leading edge is not glued yet.

Note: The servo frame must now be inserted between ribs 7 and 8 at the latest.

Temporarily insert the spar bar into the ribs. This ensures that all ribs are vertical. Fix each rib in the slipway with a drop of medium-viscosity super glue. Ribs 18 and 19 must be checked for vertical stand with a suitable right angle. Remove the spar bar again.

Slide the bottom planking into the ribs. The planking is laterally aligned with rib 2.



Grind the CFRP spar on both sides and remove dust. Slide it between the ribs and the planking from the outside. Check whether the CFRP spar is seated correctly everywhere.

Place the spar bar on the ribs and press it down to the CFRP spar at all points. The top of the spar bar must be flush with the ribs.

Check carefully that the bottom planking is pushed all the way to the back in all places. If everything fits exactly, you can start gluing. Use thin super glue for this purpose.

Fix the lower planking to the spar in a few places so that the planking can no longer slip.

Now glue the planking to the ribs. To do this, press the planking to the rib with a strip that spans at least the two adjacent rib bays. Glue this rib to the planking. Wait until the superglue has dried. Glue all the ribs to the planking.

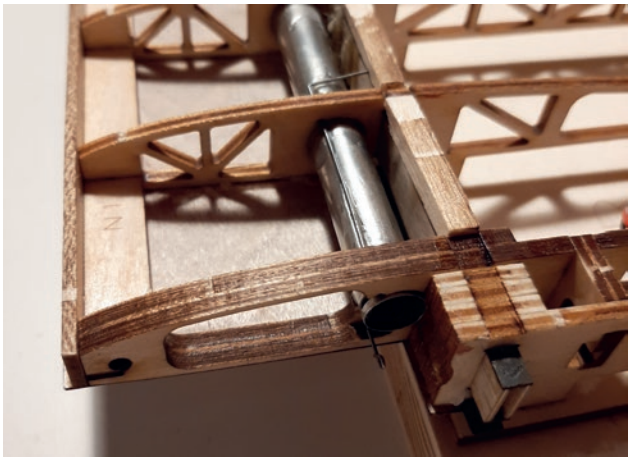
Now glue the intronase bar and the spar bar to the ribs.

The CFRP spar is bonded to the planking from behind.
Glue the servo frame to ribs 7 and 8. Now you can glue the two remaining parts of the servo frame, Svo and Sho, to the servo frame with white glue. Wipe off any glue that has swelled out, otherwise the servo cannot be mounted.

4.4 BALSA LEADING EDGE

Place the 2mm balsa leading edge on the lower planking and look at the profile shape on the balsa leading edge from the side and carefully sand a chamfer on the front edge of the balsa leading edge so that it follows the profile of the rib exactly and there is no gap between the lower planking and the balsa leading edge. Be sure not to sand the trailing edge in any case, or you may end up with wavy planking. If you are unsure, it is better to sand less, the gap is very minimal, it is sufficient to break the front edge.

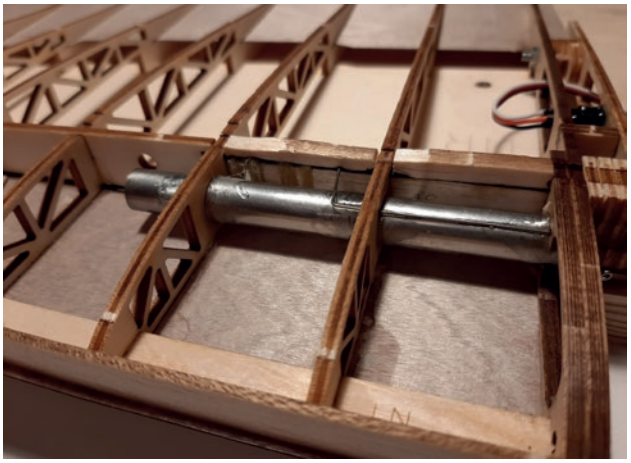
To glue the balsa leading edge, press it against rib 2 and the lower planking and glue the leading edge at this point. Make sure that the leading edge always rests on the planking. Glue the balsa leading edge rib by rib to the outside of the wing.



4.5 BONDING THE BALLAST PIPE

Pull the ballast tube approx. 5 mm in the direction of the wing tip and spread epoxy adhesive around the tube on the outside of the ribs, turning it slightly as you do so.

Turn the spring wire latch away and push the tube up to the stop on the front pressure bar. Rotate the tube here so that the adhesive is distributed as well as possible between the tube and the ribs.



Now also apply glue to the other side of the ribs and turn the tube a little more so that the glue is well distributed.

Now align the tube so that the wire comes to rest in the slot of the ballast tube. Rotate the tube until the wire touches the top of the slot and then minimally back again.

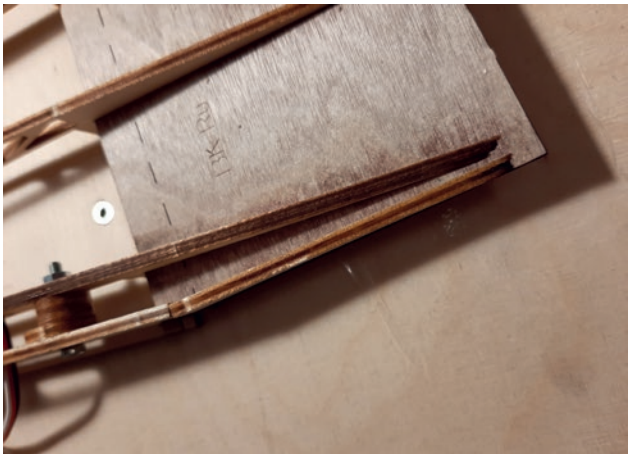
If glue has gotten on the top of the ribs, wipe it off well.

4.6 REAR BOTTOM PLANKING

Slide the lower rear planking into the ribs. The rear end of the planking must end with the end of the rib feet and is laterally aligned with the front part of rib 1.

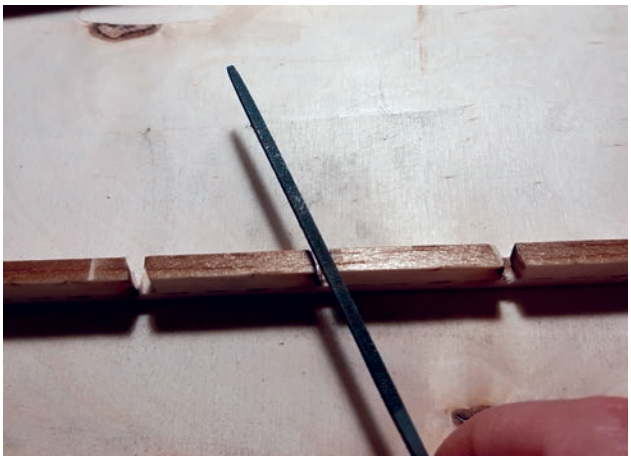
When everything is exactly aligned, the planking can be glued in place from above using superglue.

The rear end of rib 1 is aligned with the planking and glued in place.



4.7 FLAP BAR

Place the front flap bar on the wing and align it with the front edge of the lower planking. The flap bar cannot yet be pressed down toward the planking. To do this, the recesses must be adjusted to the orientation of the ribs.



Mark or note the angle at which the recess must be adjusted. Note, however, that after turning the flap bar over for machining, the orientation remains correct.

You can make the adjustment with a fine file. A 3 mm square file is very suitable for this purpose.

Insert the front flap bar and align it exactly with the front edge of the lower planking. Check whether the flap bar has been pressed down to the planking everywhere. Glue the front flap bar with thin super glue. Allow the superglue to dry well before you continue working.

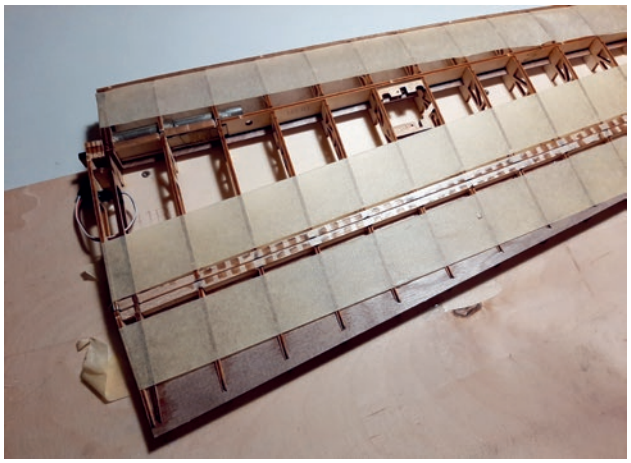
Edit the recesses of the rear flap bar accordingly and insert the rear flap bar with some distance to the front one. You can use a remnant piece of the planking to get an even distance. This spacing will make it easier to separate the ailerons later. Again, check that the flap stay rests on the lower planking and glue it in place.

4.8 GRINDING THE TOP OF THE WING

Cut off the upper part of the two flap bars with a sharp knife along the lasered line.

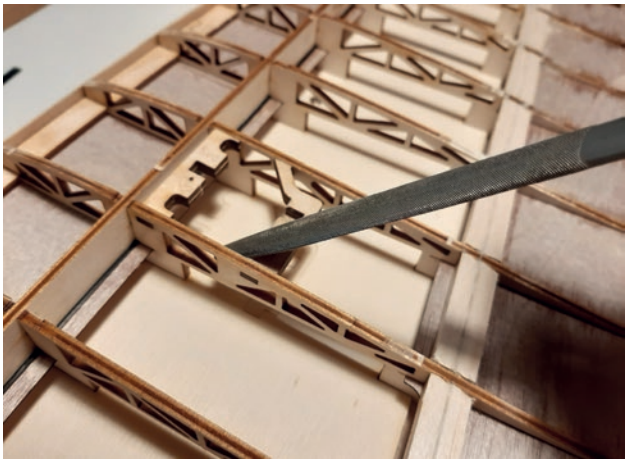
For protection, tape the ribs behind the leading edge and in front of and behind the spar bars with masking tape.

Sand the balsa leading edge to match the ribs. Use the sanding block for this purpose. Make sure that you always cover several rib fields with the sanding block so that you do not grind a wave into the leading edge.

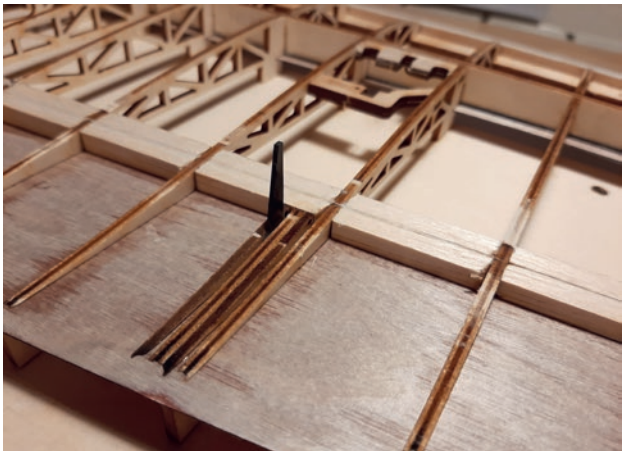


Grind the two flap bars down to the height of the ribs. Use the sanding lath here as well. When sanding, make sure that you do not sand away the stop of the upper planking on the ribs. For this reason, only sand on the side facing the end strip.

Use a fine flat file to grind a slight bevel on the inner edge of the servo frame so that you will not have any problems later when inserting the servo.



4.9 RUDDER LEVER COUNTER BEARING



Now you can glue the counter bearing of the rudder lever to the lower planking. To do this, mount the ball head between the two rudder levers. The ball head has a width of 5 mm. The rudder lever is mounted on the side of rib 8 towards rib 7. You can easily check this with the upper planking. So the sequence is as follows: Rib 8 - rudder lever - R7a - S7b - rudder lever - S7b. Check this with the assembled rudder lever before gluing the parts on. When gluing, it is recommended to use a CFRP remnant as a spacer. The rudder lever is glued in place only after the rudders have been covered.

Now, starting on the side of rib 8, place the first counter bearing piece on the planking and align it with the spacer. Remove the spacer without moving the counter bearing piece and glue it to the lower planking with super glue. Proceed accordingly with the other two parts (see above for sequence).

4.10 REAR UPPER PLANKING

Now glue the rear upper planking with white glue. Align the planking flush with the front flap bar and the two slots for the rudder levers. Weight the planking with flat weights. You should not get any distortion or waves in the rudder.
Test whether the rudder lever fits into the recess and, if necessary, work after.

4.11 FINISH SPAR BAR

IIn the area of the junction box, there is still a gap between the CFRP spar and the junction box. This space is filled with balsa remnants.

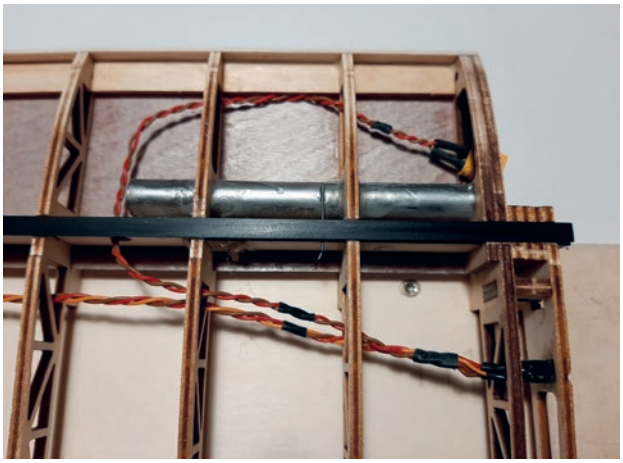
Fit the four remnants and glue them into the clearance with epoxy resin.

You can adjust the two upper filler pieces to the height of the support of the CFRP spar with a file.

Place the CFRP spar, which has already been ground on both sides, on top of the spar bar. And check whether it is deep enough over the entire length. You may have to carefully regrind the tie bar, the CFRP tie bar is not ground. If the CKF spar is not deep enough, this can lead to an edge on the upper planking.

Glue the CFRP spar to the spar bar with epoxy adhesive.

4.12 BATTERY CABLE

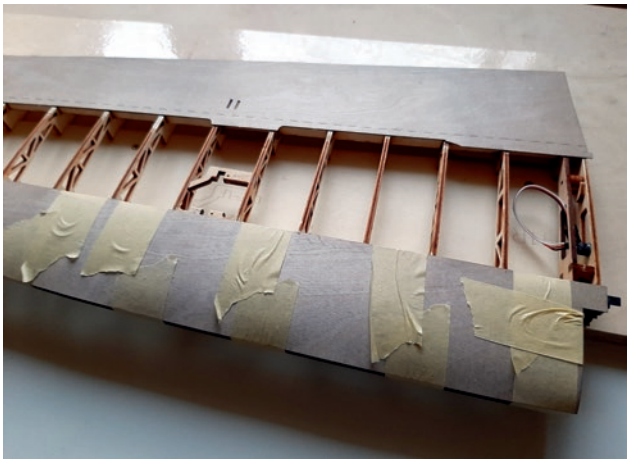


The cable from the battery connector to the 4-pin socket is only routed on the left half of the wing.

Thread the cable for the battery connection through the spar bar and forward again to rib 2 in the front D-box area. The cable should be just long enough so that you can still easily grasp the connector in front of rib 2. The cable should not be unnecessarily long, as it is pushed into the D-box area together with the battery.

Solder the XT30 connector onto the cable.
Make sure that the polarity is correct. For insulation you can use the enclosed heat shrink tubing. When using the recommended Wellpower Ultima 1000mAh 2S Lipo battery (#9788328), the XT30 is not required as this battery already has a JR/Uni connector. A standard JR/UNI extension cable may be required.

4.13 FRONT UPPER PLANKING



Check whether the ballast tube is properly glued and closed and whether the torsion spring for locking the ballast tube is correctly seated. The cable to the battery must be routed on the left half of the wing. You cannot make any changes here later.

The front upper planking is glued on with white glue. Align the planking with rib 1 and the spar and push the planking up to the step in the ribs. The exact alignment of the planking is important for the later assembly of the middle planking.

Secure the planking in some places of the spar with masking tape.

Coat the ribs, spar and balsa leading edge with white glue and place the planking correctly positioned on.

Fix the planking with masking tape.

Make sure that you do not pull any waves into the planking with the masking tape. The planking must rest on all ribs. Apply weights to the surface of the planking.

4.14 UPPER MIDDLE PLANKING

Place the three upper middle planks on the wing. Adjust the planking to the space between the front and rear planking. There should be no gap between the planking, but the planking must not be under tension either, otherwise it will bow upwards. The grain direction of the outer planking is in the direction of flight.

Check the ribs to see if there is any glue that may have swollen out, which could be the reason why the planking does not fit neatly there.

Mark the approximate position of the ribs on the center planking. Glue a tab to the underside of the center planking in the areas between the ribs. To do this, adjust the length of the tabs, place them under the planking and glue them in place with a drop of super glue. Make sure that you do this on a surface to which the planking cannot stick, e.g. on the building board taped with parcel tape.

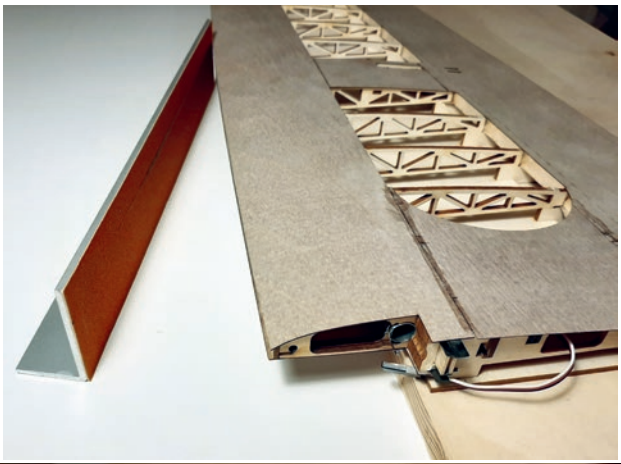
After the tabs are glued on, you should test again whether the planking fits into the free area between the front and rear planking.

Now you can glue the middle planking with white glue. Use masking tape to fix the transitions between the planks and, until the adhesive has cured, weigh down the middle plank with weights over its entire surface.

While planking the servo box, you must make sure that no white glue gets into the area of the servo frame, otherwise the servo cannot be pressed far enough into the servo frame later on.

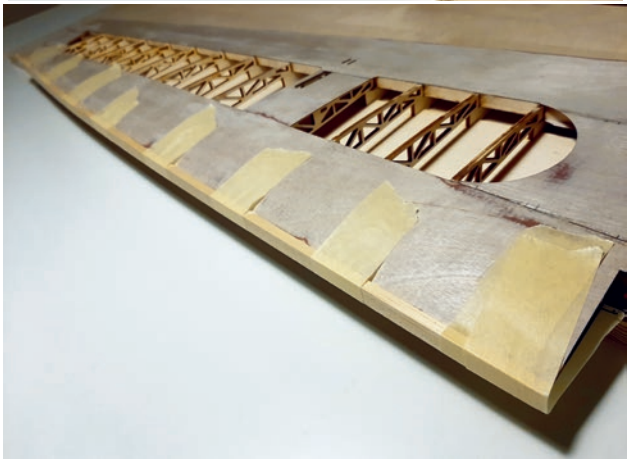
4.15 LIME NOSE STRIP

Sand the front top and bottom planking back to the balsa leading edge. For this purpose, you should use a long right-angled sanding lath. For example, an L-shaped aluminum profile with a side length of 30 x 50 mm is very suitable for this purpose. Place the building board together with the wing on a building table. The construction table should have a flat surface. Place the sanding board on the construction table and sand off the excess planking by sliding the sanding board back and forth on the construction table. This guarantees uniform, waveless and vertical sanding.



When the overhang is completely sanded away, you can glue the basswood leading edge to the balsa leading edge with white glue.

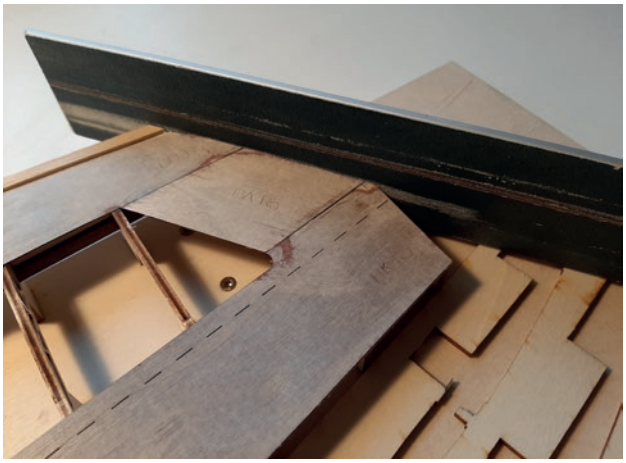
Press the Linde leading edge to the wing with masking tape and check that the Linde leading edge protrudes on both sides.



4.16 GRINDING OFF OVERHANGS

Note: When grinding, pay attention to the magnet, the bushing and the spring of the ballast tube.

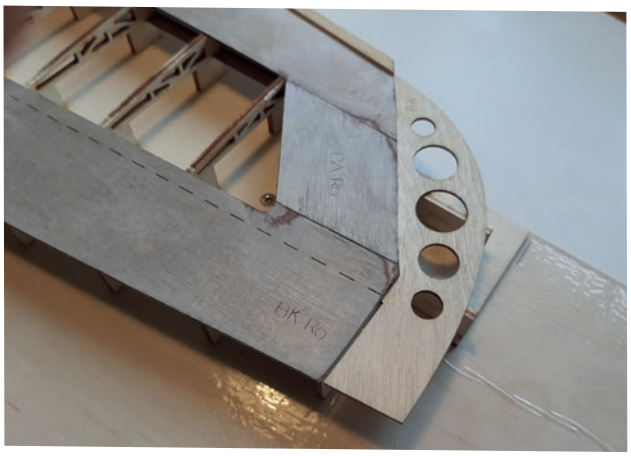
Grind the protruding planking on the root rib and on the edge bow flat with the root rib or the slanted rib. Proceed in the same way as for grinding the planking on the leading edge. Since the slipway protrudes slightly above the ribs, you must place a remnant piece of poplar plywood underneath to compensate for the difference in height.



4.17 EDGING STRIP

Insert the two edging strips supports vertically into the slipway and fix them with some super glue.

Check the accuracy of fit of the edging strip made of aircraft plywood. It must be possible to insert the edging strip into the slanted rib without any gaps and it must end at the same height as the end strip of the rudders. The edging strip is placed on the two supports and inserted into the slots of the slanted rib.



When everything fits, remove the edging strip from the wing again and glue the upper balsa edging strip congruently to the aircraft plywood with white glue. Be sure to build the edging strip for the correct side. To dry the glue, weigh down the two parts and place them on a flat surface.

Glue the edging strip to the wing with white glue. There is a small gap in the aileron area. No glue should be applied here. Until the glue dries, weigh down the eding strip so that it rests on the two supports.

4.18 SEPERATING WING FROM SLIPWAY

Note: The bar to the fanouts in the ribs is very thin in places. There is a risk that this web will be torn off. Work with the appropriate caution.

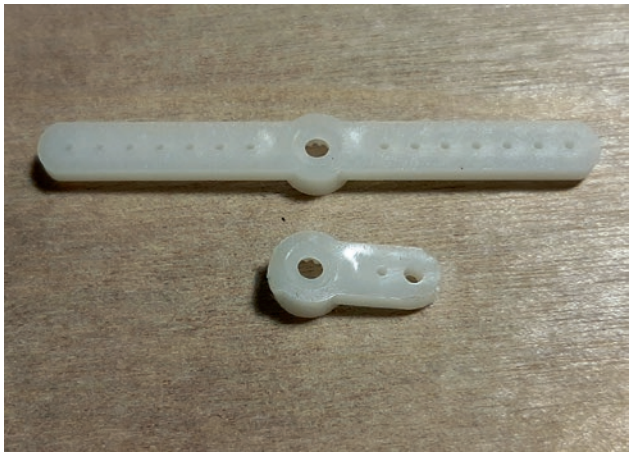
Separate the wing from the slipway. To do this, use a fine Japanese saw and cut through the feet of the ribs just above the slipway.

After the wing has been completely separated from the building board, the remaining parts of the feet can now be cut off and sanded flat with the planking.

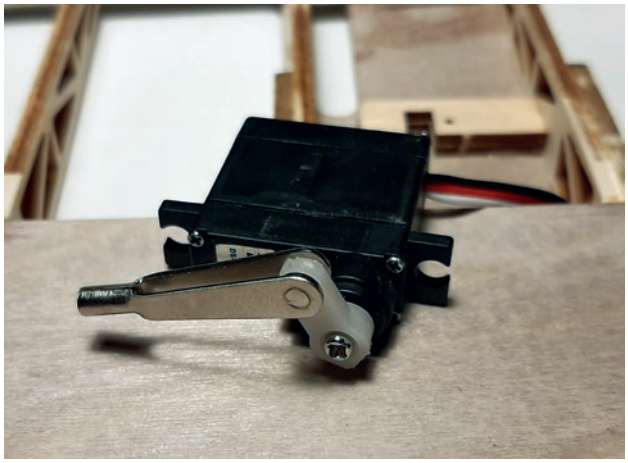
In the area of the center planking, you must take into account that the ribs must be ground slightly deeper than the planking so that the center planking can be glued flat to the front or rear planking.

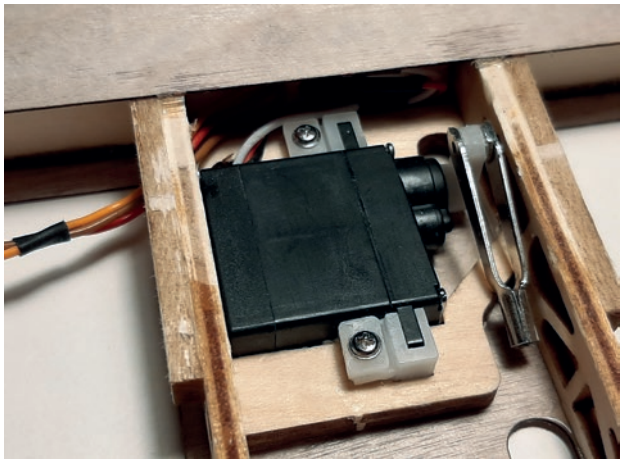
4.19 INSTALL SERVO

Prepare the servo arm. The servo arm should have a linkage hole at 6 mm. Shorten the servo arm accordingly and, if necessary, drill out the linkage hole so that the clevis can be mounted. If necessary, the clevis must be ground out on one side to allow the required rudder deflections.



Servo arm on the servo. The servo arm should be aligned perpendicular to the linkage.





The cable of the servo on the right wing side must be extended. Thread the cable through the rib cutouts to the root rib. Solder the cable of the left servo to the cable of the bushing. The cable must already be threaded through the ribs before soldering. The soldering points are each insulated with heat shrink tubing.

Mount the servo in the servo frame.

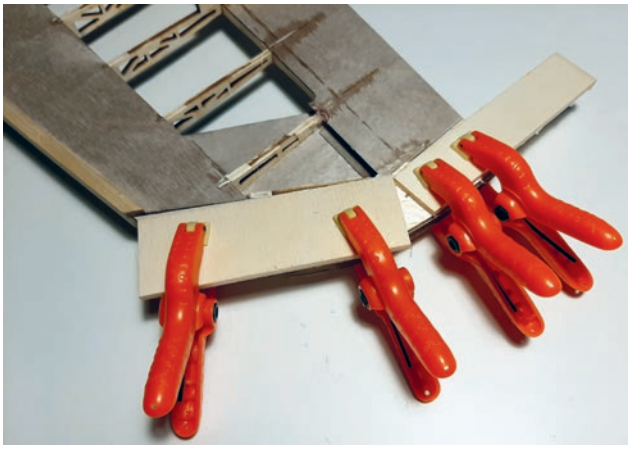
4.20 WING LOOKING HOOKS

Guide the wing locking hook through rib 1 and insert the hook into the pressure bar. Press the hook into the recess with pliers. If the hook is seated correctly, you can secure it with superglue to prevent it from falling out.

4.21 LOWER EDGING STRIP

Glue the lower balsa edging strip congruently with white glue under the already installed edging strip.

Press the pieces together with clamps until the glue dries. Use wood remnants to protect the balsa wood.



4.22 LOWER MIDDLE PLANKING

Proceed accordingly for the lower middle planking to the upper middle planking.
Match the three lower center planking to the front and rear lower planking and glue the tabs to the planking again.

Glue the planking in place using white glue. The planking on the outside of the sash is positioned against the edging strip without any gaps.

Grind the planking flat at the root rib. Pay attention here to the wing locking hook, the bushing and the magnet. Finally, the lid of the servo box is adapted to the planking. Please take into account that the lid will be covered with foil.

4.23 GRINDING THE LEADING EDGE AND EDGING STRIP

Now grind the leading edge and the edging strip to contour. For this you should again use a grinding lath.
There are four profile templates in the kit. The number of the template indicates the rib where this template defines the profile of the leading edge.

Before sanding, mask the planking with masking tape. When the chamfer strip has been sanded, remove the masking tape and sand the transition flat.

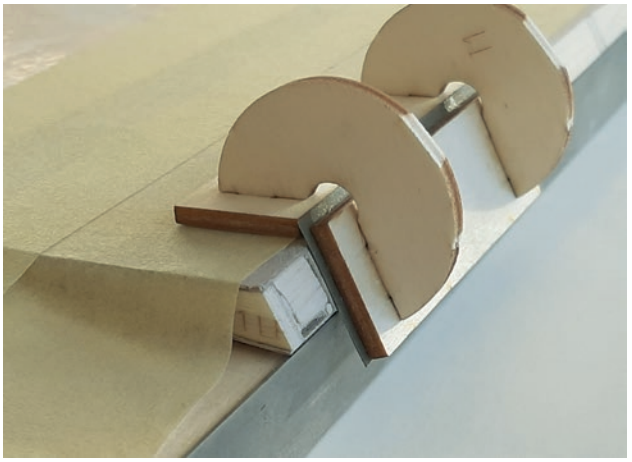
The profile of the edging strip is ground with a long grinding lath as an extension of the wing profile and rounded off at the wing tip. When grinding the edging strip, ensure that both edging strips of the two wing halves are ground equally.

4.24 CUT OFF AND GRIND RUDDER

Separate the rudder along the dashed line of the rear planking. Start with the top side. The cut line of the bottom side must be executed very precisely, since the rudder will be hinged at this edge and should be sanded as little as possible. On the top side, grind the throat of the rudder gap. When cutting the planking, you should come out in the gap between the two flap webs.
You can use a sharp knife with a steel ruler, a very fine Japanese saw or a multifunctional tool with a thin cutting disc. In any case, first score the cutting line with the knife, so that you have an exact guide in any case, if you want to use other tools.
After the rudder has been cut off, straighten the lower cut edge of the wing and the rudder with the sanding block. Grind as little as possible here.

4 WING ASSEMBLY

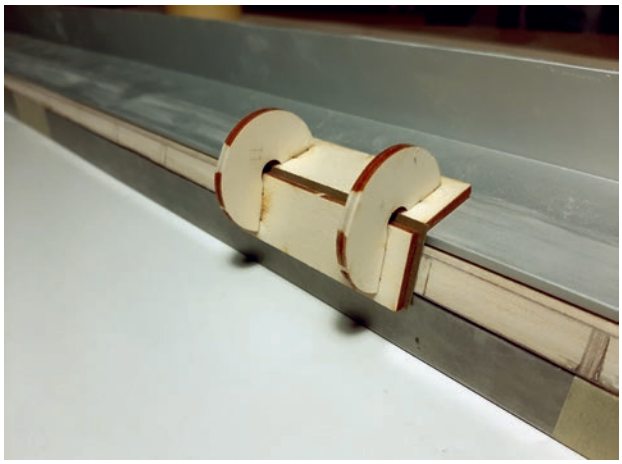
KIT



To grind the rudder gap at the correct angle, use the grinding jig.
Fix the rudder with masking tape along a straight edge of the table, which should be protected by a steel band. Protect the planking of the rudder by masking it with masking tape.

Now grind the angle into the rudder. You can also do the rough preliminary work with the sanding lath. You should definitely finish off with the sanding gauge.

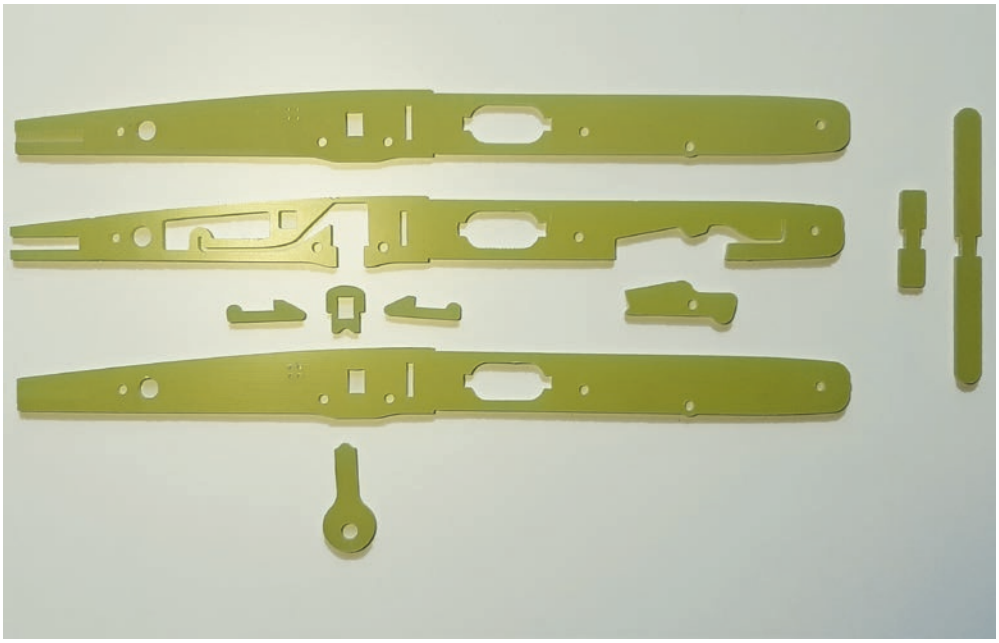
Proceed accordingly for the wing. To protect the ribs, it is advisable not to slide the sanding gauge back and forth directly on the planking and the ribs, but to place a longer contact surface, e.g. an aluminium profile.



5 GRP CENTRE RIB

KIT

Separate the parts of the GRP centre rib from the panel material. To do this, you can either use a fine side cutter, a fretsaw or similar. Carefully sand away the remnants of the retaining webs.



5.1 CFRP PINS

Prepare the CFRP pins for the centre rib. Use the 3 mm CFRP round bar U6 for this. You need four short approx. 10 mm long pins and one long approx. 40 mm pin.

Temporarily place the left and centre ribs on top of each other and use the CFRP pins to join the two ribs together. Do not glue yet.

The long CFRP pin serves as a torsion pin and is inserted into the rear 3 mm hole. The four short pins are inserted into the 3 mm holes at the front.

5.2 BUNGEE HOOK

Grind the bungee hook approx. 2/10 mm thinner. It must be possible to move it easily between the two outer sides. Bend the spring for the bungee hook. Use the 0.8 mm spring steel wire J2 for this.

Mount the hook with the M3 screw J3 in the left side wall of the centre rib and insert the spring in the slot. Check the function of the spring and the smoothness of the whole mechanism.

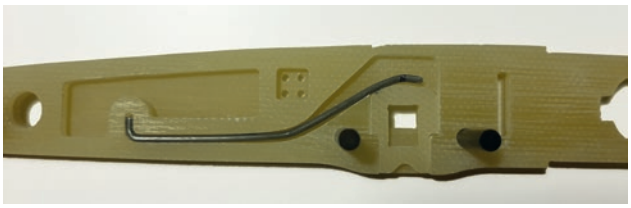
You can push the hook out of the ripper by the bulge and the bungee rubber is hooked onto the folded-out part of the hook. By pulling the rubber, the hook is also held in the unfolded position. When you let go of the hook, it should fold back into the centre rib.

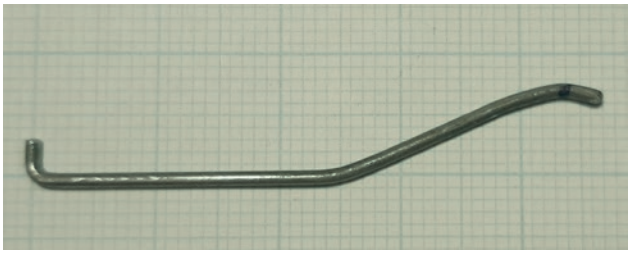
5.3 WING LOCK

Grind the latch for wing locking approx. 2/10 mm thinner. It must be possible to move it easily between the two outer sides.

Bend the spring for the locking mechanism according to the adjacent illustration. The 1.2 mm spring steel wire J1 is used for this purpose.

Test the ease of movement and spring action in the provisionally assembled centre rib.

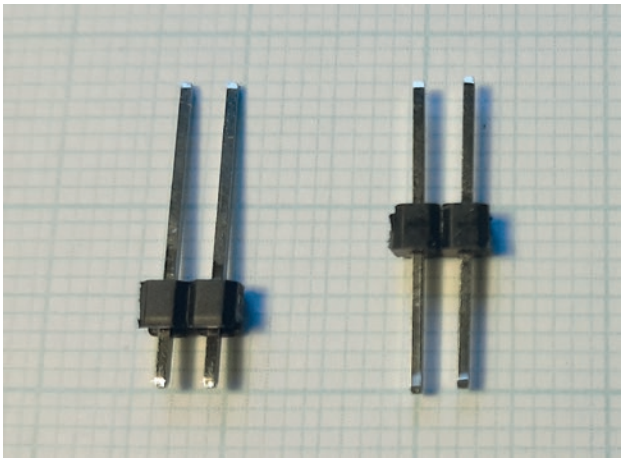




5.4 PLUG CONTACT

Push the plastic support of the 17 mm long pin strip E4 into the centre of the pins.

Use a superglue to secure the plastic carrier.



5.5 ASSEMBLING THE CENTRE RIB

Sand the 4 inward facing surfaces of the three GRP centre sections. At the rear end of the two outer ribs a recess is milled into the rib. This recess is on the inside.
Rub the hook, the screw and the spring with Vaseline. Also the wing lock and the spring for this.

Coat the centre rib on both sides very thinly with epoxy glue.
Using a cotton swab or something similar, wipe away the glue around the area of the wing latch, the hook and the two springs. No glue should get into this area.
Place the middle rib on an outer rib. Position the two ribs in relation to each other and insert the four short CFRP pins into the four front holes. The long CFRP pin goes into the rear hole; this will be fitted later.

Check that no glue has got into the area of the wing latch, the hook and the two springs. If in doubt, wipe off the glue as best as possible.
Insert the well greased springs, the wing latch and the hook into the middle rib. Insert the M3 screw J3 through the outer rib and the hook.
Put some epoxy glue into the recess for the 2x2 pole plug contact and push it through the outer rib from the inside.
Put on the second outer rib and press the three ribs lightly together.
To be on the safe side and to remove potentially misdirected glue, check the function of the wing lock and the hook.
After the glue of the centre rib has hardened, remove the M3 screw J3 and degrease it. Replace the screw and fit the lock and nut on the screw. The nut should also be secured with threadlocker.

5.6 BATTERY HOLDER AND TORSION PIN

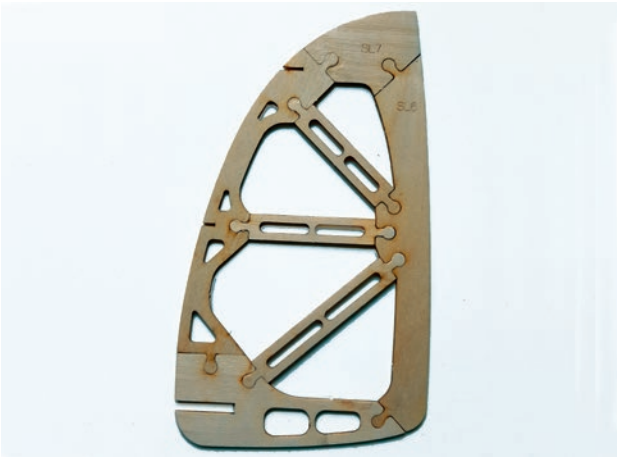
Match the recess in the two GRP battery mounts to the thickness of the GRP centre rib. The thickness of the centre rib varies due to the amount of epoxy glue used.
Glue the long bracket into the battery grommet of the centre rib at the front and the short one at the back.
Glue the CFRP torsion pin centrally in the rear 3 mm hole.

5.7 GRP NOSE

Prepare the GRP nose for finishing the model.
To do this, you need to work out the cut-out for the hook on the underside. There is a mark on the JRC nose with the shape and position of this cut-out.
Then cut out the section for the battery on both sides of the GRP nose. Again, you can use the marking as a guide. Remove as little material as possible to ensure good stability of the cover.
Test the fit of the recesses.
The GRP nose is not yet glued to the GRP centre rib. This will be done after weighing and first flight.

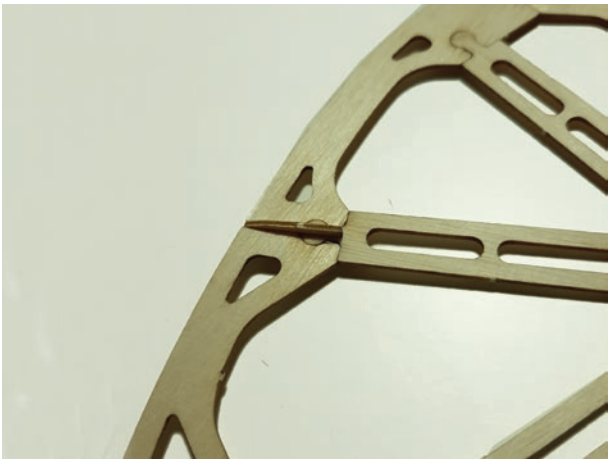
6.1 MIDDLE LEVEL

Carefully separate the components SL1 to SL7 from the wooden board with a cutter knife and sand the webs flat with sandpaper.
Assemble the parts SL1 (bottom), SL5 (front), SL6 (back) and SL7 (top). To do this, lay the parts flat on the building board and press them together with a flat hard object.
Now insert the three crossbars SL2 (bottom), SL3 (middle) and SL4 (top).
Check that the centre plane lies completely flat on the building board and has no warpage.
Glue the parts together with thin liquid super glue.



6.2 PROFILE SHAPES

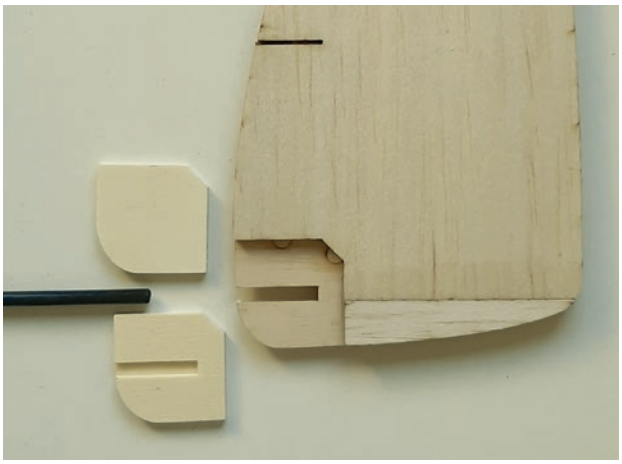
Slide the two profile shapes SL8 (top) and SL9 (bottom) from the front onto the fin.
They must not protrude beyond the front edge of the centre plane. To ensure this, you can roll the front edge of the centre plane over a hard surface.
Check that the two profile shapes are centred and not bent.
Glue them in place with superglue.



6.3 PLANKING

The planking of the rudder consists of three balsa parts per side.
Apply white glue thinly and evenly to the centre plane and the joints. Position the three balsa parts exactly to the centre plane and the profile shapes. Proceed in the same way on the other side.
Wipe off any white glue that has come out with a damp cloth.
To dry, lay the rudder flat on a level surface and weigh it down so that it does not warp.
Glue the two plywood pieces for guiding the rudder carrier to the centre plane also with white glue.

Check with the 4 mm CFRP rod that there is no white glue in the recess. Remove the CFRP rod to dry, it will be glued in later.



The rudder is profiled and must be sanded according to the two profile formations. The rudder has its maximum thickness at the blue line drawn in the adjacent picture. If you wish, you can also make a sanding template out of paper and stick it on the rudder with a glue stick.

While sanding the rudder in front, you can orientate yourself by the dark colouring of the burn-off on the cut surface of SL8 and SL9. For sanding it is recommended to use the long sanding bar again to avoid waves.

Note: While sanding the front, tape the rear part with a strip of masking tape. When sanding the rear rudder, tape the front. This will prevent the maximum thickness of the rudder from being accidentally sanded thinner.

Towards the trailing edge the rudder is ground flat. At the imaginary line the rudder keeps the maximum thickness. At the trailing edge it is sanded down to the centre plane.
Make sure that the left and right sides of the rudder become identical. To check, you can run two fingers over the two sides and feel the shape very well.

6.4 TAIL BOOM

Temporarily insert the 4mm CFRP rod into the rudder and slide the 6mm CFRP tube over the CFRP rod. If the tube is very difficult to slide on, look at the cut edge and work it carefully.
Use a round file to grind an approx. 3 mm deep notch into the end of the CFRP tube. The shape of the notch should correspond as well as possible to the profile of the rudder at this point.

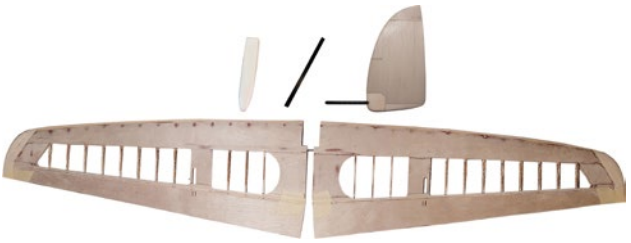
Shorten the 6 mm CFRP tube to a length of 55 mm. Measure from the notch to the other end. Adjust the length of the 4 mm CFRP rod so that it can be fully inserted into the centre rib and the rudder.
Roughen the 4 mm CFRP rod with sandpaper and the inside of the 6 mm CFRP tube with a round file.

Note: The CFRP rod and the CFRP tube are only glued in a later work step.

7 COVERING AN DECAL SHEET

KIT

Before you can start with the actual covering, you must thoroughly remove dust from all surfaces. A slightly damp cotton cloth can also be used for this purpose.
Start with the undersides and first tack the iron-on film to selected straight lines with moderate temperature. Then you can cover the adjacent surfaces from the inside to the outside with a light pull.



The actual decal sheets are applied with the later top side on a carrier foil and provided with a protective foil on the adhesive side.
To remove the decal sheets from the protective film, the transfer film must be pressed firmly against the decal to create a secure bond.
Then peel off the backing film with the decal from the protective film at as acute an angle as possible.
From now on, special care is required when handling the decal on the backing film to avoid soiling the adhesive side or accidentally sticking it in the wrong place. For this purpose, it is best to leave the backing film with the decal flat on the table (adhesive side up).
Slightly wet the application point for the decal piece with relaxed water (e.g. by adding a little washing-up liquid). This allows the decor to be moved before the adhesive takes effect.
Now the decal can be applied to the surface and aligned.

After alignment, the water is now gently spread out under the decal with a felt squeegee or a cotton cloth.
Finally, carefully peel off the transfer foil at as acute an angle as possible. You should now leave the entire surface to dry in peace until the adhesive has achieved its full effect.

8 FINISHING

KIT

8.1 RUDDER ASSEMBLING

Glue the rudders with a long strip of tape. Start on the underside, then fold the rudder completely over onto the underside of the wing and apply a second strip to the upper side, i.e. in the gap between the rudder and the wing.
Move the servos to the centre position. The servo lever should point slightly towards the rudder and not be perpendicular to the servo housing.

Screw the M2 threaded rod into the ball joint and, if necessary, shorten the M2 threaded rod to the required length.
Screw the linkage (incl. M2 lock nut) into the clevis and adjust to the correct length. Mount the ball joint with the M2 screw in the rudder lever.
Secure the threaded rod in the fork head with the M2 lock nut and possibly with screw locking varnish.

8.2 WING JOINER

The length of the wing joiner U8 must be shortened to a minimum.
To do this, pin the wing halves and the centre rib together with the wing pin and measure the gap that is still open.
Shorten the CFRP connector U8 by the corresponding length.

8.3 RUDDER GLUEING IN

Glue the 4 mm CFRP rod into the centre rib with epoxy glue. If possible, let the glue harden in peace and make sure that the rod is aligned exactly in extension of the centre rib.

Note: The rest of the rudder assembly must be done in one step.

Coat the remaining 4 mm CFRP rod thinly with epoxy glue. Slide the 6 mm CFRP tube onto the CFRP rod with the notch facing the rudder. Wipe away the excess glue.

Put some epoxy glue in the hole in the rudder and slide the rudder onto the CFRP rod. Turn the 6 mm CFRP tube so that the rudder can be pushed forward into the notch. Wipe off the glue that has come out of the rudder. Carefully assemble the two halves of the wing including the centre rib with the rudder.

Place the wing upside down on a flat surface. The rudder must not rest on the surface and must be freely aligned. Align the rudder perpendicular to the wing. Check that the rudder is exactly in the direction of flight.

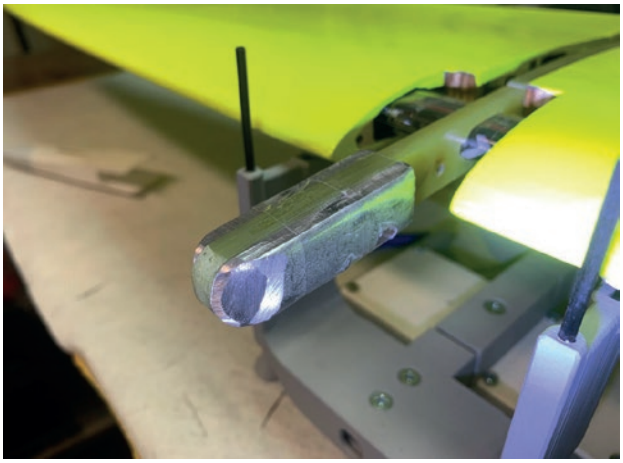
8.4 WEIGHING

The centre of gravity is 52 mm from the leading edge of the wing. The measurement is taken directly next to the GRP nose.
The following procedure has proven to be a practicable solution for adjusting the centre of gravity.
Fill the GRP nose with lead balls mixed with some epoxy glue up to the beginning of the GRP centre rib. Wrap the GRP centre rib in some cling film beforehand so that the lead balls and the GRP centre rib do not stick together. Until the glue has hardened, place the GRP centre rib with the GRP nose attached vertically on the tip of the nose. The lead balls should enter the nose tip as far forward as possible. A much simpler solution is offered by the cast trim weight # 26950001, which is available especially for VAYU.

Now mount the GRP centre rib together with the attached GRP nose and the wings. Place the model on a centre of gravity scale and set the centre of gravity to 52 mm. To do this, place the required amount of rolled lead on the GRP nose in the area of the tip of the GRP centre rib up to the screw of the hook.

Attach the weighed lead sheet to both sides of the GRP centre rib. To do this, cut the rolled lead in the contour of the centre rib and glue it on with adhesive tape or 5-min epoxy glue. You should cut off any excess lead at the top and bottom.

Check the centre of gravity and adjust the weight on the centre rib if necessary.



8.5 GLUEING ON THE GRP NOSE

After the centre of gravity has been finally adjusted, the GRP nose can be glued onto the GRP centre rib with hot glue. By slightly warming the nose, it can later be removed more easily than if it is firmly bonded with e.g. epoxy resin. To do this, carefully sand the GRP nose on the inside.

Keep in mind that it is very difficult to change the centre of gravity after gluing on the GRP nose. If, for this reason, you want to wait for the first flights before gluing on the GRP nose, we recommend that you secure the nose with double-sided adhesive tape and also with adhesive tape on the outside. It is also advisable to launch the model with the hook, as the model must be held by the nose when it is thrown.

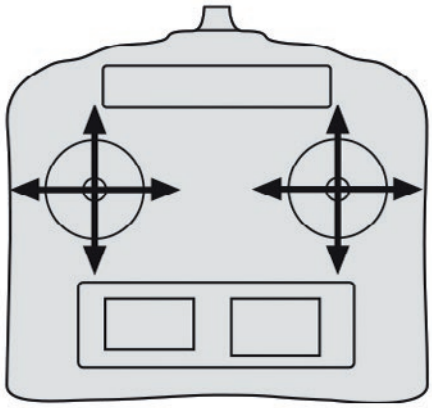
9.1 RECEIVER

Slide the receiver with the antennas first into the right wing. Plug the two servo connection cables into the receiver according to the specifications of your RC transmitter system. Now push the receiver completely into the wing and fix it with some foam.

9.2 RC PROGRAMMING

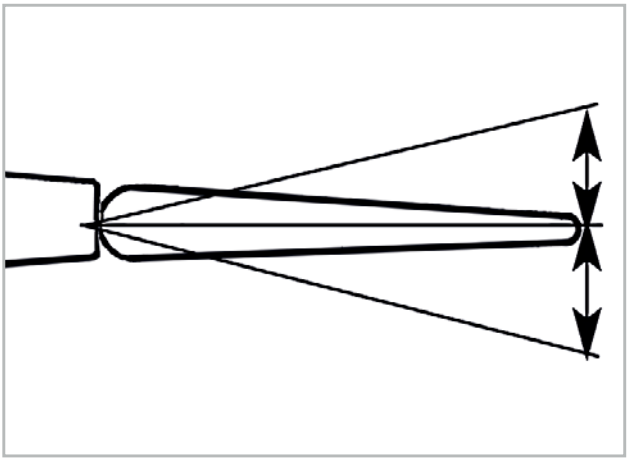
Program your RC system using a delta mixer and, if necessary, create desired flight phases for take-off, normal flight, aerobatics, etc.

Before the first take-off, always carry out a range and function test to ensure that all control surfaces move as desired and that operational safety is ensured.



9.2.1 SETTING VALUES AND FLIGHT PHRASES

The deflection of the rudders is measured on the very inside at the trailing edge of the rudders and should not exceed approx. 12 mm upwards or downwards. As soon as you have gained your own flying experience, you can adjust the setting values according to your preferences.
In flight testing by the test pilots, the following settings were determined:



9 INSTALLATION OF RC-COMPONENTS

KIT

RUDDER THROWS

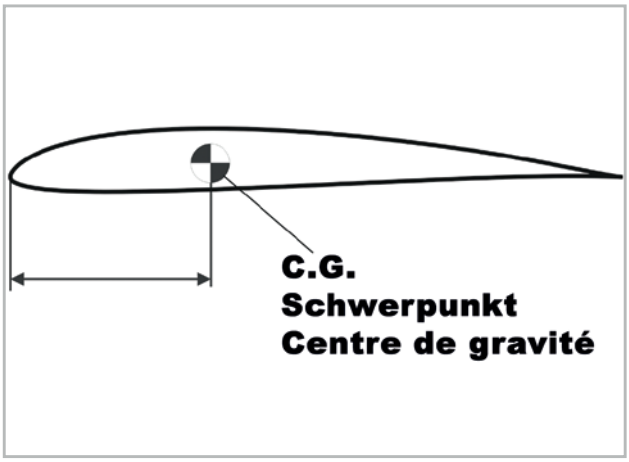
(measured at the end rail)

Function	Start	Normal	Speed	Thermal
Neutral position	Rudder 10% upwards	Rudder 5% upwards	Rudder modified	Rudder 10% upwards
Elevator	▲ 5 mm ▼ 5 mm	▲ 5 mm ▼ 5 mm	▲ 5 mm ▼ 5 mm	▲ 5 mm ▼ 5 mm
Ailerons	▲ 12 mm ▼ 12 mm	▲ 12 mm ▼ 12 mm	▲ 12 mm ▼ 12 mm	▲ 10 mm ▼ 8 mm

It is recommended to programme 50-70% Expo on the elevator and aileron control functions.

9.2.2 C.G.

For the first flight tests, set the centre of gravity to 52mm from the leading edge.



FOR YOUR NOTES

10 MAIDEN FLIGHT

For the first flight it is advisable to have a launch helper who throws the model or launches it with the hook.

Note: Always start the VAYU in the take-off flight phase.

The VAYU can be launched effortlessly from the hand. To do this, throw the VAYU loosely, slightly downwards, and give it a short time to pick up the necessary speed. Throwing too hard or throwing upwards often leads to unsuccessful launches.

For a bungee launch on a slope we recommend a rubber about 7m long with at least a launch pull of 5 times the model weight. For the first flight, extend the rubber only a few steps. The model should rise slightly after leaving the rubber. Pulling or pushing during the launch is not necessary.

Note: When bungee launching, be sure to use a ring, as a rope loop could possibly get caught in the bungee mechanism.

If you need to re-trim in flight, do so in very small steps. First try out the new trim during take-off. You will notice the change in trim very clearly, especially on the wing due to the high speed. Consider whether you need to change the centre of gravity instead of trimming.

The VAYU develops its performance through speed. Try flying the VAYU rather faster even in very weak conditions. You will notice that the VAYU holds altitude better than at slower speeds.


VAYU

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