X-dream

building instructions

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Distributed by

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This model is not a toy and is not suitable for children under 14 years!

The model is designed for the advanced model maker. For assembly there is experience and understanding of the construction of balsa / plywood structures necessary!

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2.1 Model description

The X-dream is a R. (udder) E. (levator) S. (poiler) - high performance model in predominantly Timber construction with 2m span, which corresponds to the current F3-RES regulations.

We have proven designs through our experience from successfully participating in international competitions optimized according to our ideas. We always kept that Handling as well as the feasibility in wood construction in mind in order to ensure a simple structure with maximum to be able to implement better performance on the model. Only come in constructively meaningful places GRP or CFRP semi-finished products for compliant use.

In the design, the following points were particularly taken into account:

- Lowest sink rate
- Maximum take-off altitudes
- Good glide
- Simple handling, especially when thermal circles
- Greatest possible maneuverability
- Good braking and rudder effectiveness when landing
- Robust construction

The profile section modified especially for the model and the geometry set these requirements excellent around.

We have succeeded in designing a model that enables long flight times - even in dead air, has excellent circular flight characteristics, reliably displays thermals, slightest climb is good in Height and has good penetration even in windy conditions.

At the same time, the X-dream is a model that even less experienced pilots can handle quickly come.

I hope you enjoy the model

Robert Zeller

In memory of Alois Janowetz, a loyal friend, companion and co-founder of RES flight scene!

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1.1. Technical specifications

• Span:	1,999 mm
• Length:	1,180 mm
• Profile:	AG-Strak modified
• All-up weight:	from 400g
• Area:	36.0 dm2
• Wing loading:	from 11 g / dm²
• Control:	Height, side, spoiler
• EWD:	1 to 1.2 ° - depending on the focus
• Main emphasis	75-78 mm behind the leading edge
• Servo recommendation:	2 x ES09D (height + side) 2 x ES9051 (spoiler or 2 x HERMTEC H60 (height + side) 2 x HERMTEC H47 (spoiler) or 2 x KST X08 V5 (height + side) 2 x KST X08N V5 (spoiler)

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1.2. General information on construction

We tried to keep the construction of the aircraft as simple as possible without doing anything
To compromise on performance. However, it is very important to take due care
proceed in order to obtain a correctly built symmetrical and therefore powerful model.

Read through and understand the complete instructions before building!

All wooden parts are optimized or selected by hand for weight and strength.

Only cut out the laser parts and milled parts with a knife if necessary (do not break them)!

Please keep the leftovers from the boards and strips until the end, so that they may be
necessary additions can be cut

The lasered parts can be glued easily with commercially available, thin superglues.
Nevertheless, an adhesive test on a leftover piece is recommended. To improve the adhesive strength, the
The lasered surface can be cleaned with a sanding rod. Be careful to keep the shape
of the components not to be changed. In the areas where the laser parts are still connecting webs to the
own velvet board, a little regrinding is necessary after cutting out.

Due to the printing technology, slight dimensional deviations from the construction plan are possible. Correct spacing
result automatically from the components!

Deviating bonding:

Epoxy resin (UHU Plus Endfest 300, 5-min epoxy, lamination resin) for the lateral fuselage
as well as the aluminum tubes on the wing connector.

White glue for the reinforcements on the fuselage side walls and floor

It is expressly pointed out in these instructions if an adhesive other than low-viscosity
Super glue should be used.

In order to achieve the best flight performance, please pay attention to the weight. Use only the
components recommended as accessories and use adhesive sparingly.

1.3. Designations

Inner wing: Inner rectangular wing piece, which is placed in the middle of the fuselage.

Middle wing: Trapezoid between outer wing and inner wing

Outer wing: outermost wing trapezoid.

If you are faced with unsolvable problems or have questions about the construction and regulations, you can
You can also reach me at my e-mail office@zeller-modellbau.com .

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1.4. parts list

Type	number	material	use
Laser parts	1	0.8 mm birch plywood reinforcements hull	
	1	2 mm birch plywood	Reinforcements of the hull, frames, servo boards
	1	2 mm balsa	Hull side panels and bottom
	1	6 mm balsa	Fuselage nose + fuselage pipe linings
	1	4 mm balsa	Tail units and arches
	1	1.5mm balsa	Inner wing paneling below
	1	1.5mm balsa	Inner wing paneling above
	1	1.5mm balsa	Paneling of the middle wing below
	1	1.5mm balsa	Paneling of the middle wing above
	1	1 mm balsa	Cladding outer wing below + above
	1	2 mm balsa	End strips inner + middle wing, Auxiliary leading edge
	1	1.5mm balsa	End strips outer wing
	1	1.5mm plywood	Ribs A2, connector middle / outer wing
	1	2.5mm balsa	Ribs A, B, C
	1	4 mm balsa	Spar webs A, leading edge
	1	3 mm balsa	Side bars B + C, material for lining
	1	3 mm balsa	spoiler
	3	3 mm poplar plywood	Nose templates, angle template 5 ° + 6 °, ribs A8, A9, B1, B2, trunk pipe supports.
	1	Balsa 5 mm	Root ribs A1, ribs marginal arch C6, C7

Type	number	material	use
Milled parts	1	1 mm GRP black	Pendulum horizontal stabilizer, control horns
Afford	1	3 x 3 jaws	Reinforcements of the hull bottom
	2	3x3 mm balsa	Auxiliary bridge spoiler
	2	6x2 mm pine	Spar straps inner wing
	3	4x2 mm jaw	Spar chords middle and outer wing
Linkage	2	Bowden cable tube	Linkage height + side
	1	0.6 mm steel wire	Linkage rudder
	1	0.8mm steel wire	Elevator linkage
Small parts	1	CFRP tube, conical 660 mm	Fuselage tube
	2	CFRP connector 6 mm Ø plugging inside to middle wing	
	1	5 mm beech dowel	Round wood surface lock on the fuselage
	4th	3 mm CFRP rod	Torsion pins on the flat connectors
	1	Steel wire 1 mm	Stock pendulum stabilizer
	4th	3x2 mm neodymium magnets hold the spoiler shut	
	4th	3 mm washers	Hold the spoiler shut
	2	2 mm CFRP pins	Anti-twist protection of the horizontal tail unit
	1	High start hook adjustable Fully assembled	
	1	M4x10 nylon screw	Attachment of horizontal stabilizer
	1	M4 nylon nut	Attachment of horizontal stabilizer
	1	M5x25 nylon screw	Attachment wing
	4th	Aluminum tube inside Ø 7 / 6.1 mm sleeve for surface mounting	
	1	Nylon plug Ø 5 mm	Lock lead chamber

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Components overview (electronics and adhesives not included)

1.5. Additional aids / tools

The following tools are required for construction:

- Craft knife
- Alulineal
- Triangle ruler
- Small handsaw
- sanding blocks (80s, 120s, 180s)
- key files
- Pins
- Cannula for superglue
- Superglue (thin)
- UHU Plus Endfest 300, 5-min epoxy or laminating resin
- White glue

- STRAIGHT building board
- Foil iron

• Protective film (transparent film for gift wrapping) to cover the construction plans

1.6. What else is needed?

• Servos eg:	2 x EMAX ES09D (rudder, elevator) 2 x EMAX ES9051 (spoiler) or 2 x HERMTEC H60 (height + side) 2 x HERMTEC H47 (spoiler) or 2 x KST X08 V5 (height + side) 2 x KST X08N V5 (spoiler)

The enclosed servo boards are already prepared for the above servos!

• Battery pack:	GP battery pack 400mAh / 4.8V L2x2 Uni rod
• Receiver:	4 channel - as small, light and reliable as possible
• Covering film:	approx. 2.5 m ORALIGHT® with single-colored covering or approx. 3.0 m ORALIGHT® with two-tone covering
• Cable and plug:	Cable 0.08 mm and plug for cabling in the wings and trunk

You can also find all recommended and tried and tested components directly on my homepage
for the model https://zeller-modellbau.com/x-dream-kit-2000-mm-janowetz.html under accessories!

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3.1 Area construction phase

A few small strips are not listed here, which are made from scrap wood.
So don't throw away the waste wood right away!

2.1 Material for the surface

Type	number	material	use
Laser parts	1	1.5mm balsa	Inner wing paneling below
	1	1.5mm balsa	Inner wing paneling above
	1	1.5mm balsa	Paneling of the middle wing below
	1	1.5mm balsa	Paneling of the middle wing above
	1	1 mm balsa	Cladding outer wing below + above
	1	2 mm balsa	End strips inner + middle wing, Auxiliary leading edge
	1	1.5mm balsa	End strips outer wing
	1	1.5mm plywood	Ribs A2, connector middle / outer wing
	1	2.5mm balsa	Ribs A, B, C
	1	4 mm balsa	Spar webs A, leading edge
	1	3 mm balsa	Side bars B + C, material for lining
	1	3 mm balsa	spoiler
	1	3 mm poplar plywood	Nose templates, angle template 5 ° + 6 °, ribs A8, A9, B1, B2, trunk pipe supports.
	1	Balsa 5 mm	Root ribs A1, ribs marginal arch C6, C7
	1	3x3 mm balsa	Auxiliary bridge spoiler
	2	6x2 mm pine	Spar straps inner wing
	3	4x2 mm jaw	Spar chords middle and outer wing

Type	number	material	use
Small parts	2	CFRP connector 6 mm Ø plugging inside to middle wing	
	1	5 mm beech dowel	Round wood surface lock on the fuselage
	4th	3 mm CFRP rod	Torsion pins on the flat connectors

4th	3x2 mm neodymium magnets hold the spoiler shut	
4th	3 mm washers	Hold the spoiler shut
1	M5x25 nylon screw	Attachment wing
4th	Aluminum tube inside Ø 7 / 6.1 mm sleeve for surface mounting	

Components

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2.2 Structure of the inner wing

The construction plan should be stretched out on a straight construction board and covered with foil.

First of all, the 6x2 mm pine strips are cut to length with sufficient oversize.

Now the lower 1.5mm planking is glued against the pine bar from the front
care must be taken that the parts are flush on the underside. Before gluing the two parts
precisely glued on the underside with scotch tape or masking tape.

Bonding of the lower spar belt with planking (below)

The ribs are cut out and the webs sanded.

The outer ribs A8 and A9 are made of 3mm poplar plywood.

The two root ribs A1 made of 5 mm balsa and A2 made of 1.5 mm plywood are symmetrical according to the plan. glued together.

Glue in reinforcement for surface fastening.

Gluing the root ribs with reinforcements on the sides and above

Mask off the end strips approx. 12 mm from the rear and sand down to approx. 1.2 mm at an angle

Sanding the trailing edge on the underside

Finished trailing edge

Place the ribs on the stile webs A and align according to the construction plan and loosely attach the end strip

Align the plywood rib A9 with the jig 5 ° inclined (V-shape):

Ribs aligned and fixed

End rib A9 with gauge 5 ° inclined for V-shape

All ribs are aligned vertically and glued to the spar web A with superglue.
Point the trailing edge at the top.

Components fixed and prepared for gluing

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The lower planking can now be glued approx. 10 mm to the front away from the spar chord.
For the time being, it is not glued to the nose. Care should be taken that under the
Ribs do not form any gaps when glued.

Before installing the aluminum pipe, roughly sand and degrease it!

Push the aluminum tube into ribs A-8, A-9. Push the CFRP plug into the tube and everything at 90 °
Align the angle with the end rib

Alignment of the connection

Then glue the upper belt made of pine 6x2 mm with superglue.

Then the middle part can be removed from the construction plan and the lower planking and the end strip completely glued to the ribs.

Gluing the lower planking to the ribs

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Gluing the trailing edge

Now the auxiliary leading edge made of balsa 2 mm (made of board with trailing edge inner wing) is placed in front of the ribs

glued to the plank of the rib. Use this plane the inner wing to the building board and make the auxiliary leading edge vertical blow.

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Glue the auxiliary leading edge to the ribs with a ruler

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Lower planking, auxiliary leading edge and upper spar belt glued in and (optional) with a box over the first 3 Reinforced rib fields

After drying, tape over the ribs for protection and the auxiliary leading edge according to the course of the ribs grind.

Masking the ribs before sanding the auxiliary leading edge

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Sanded auxiliary leading edge

After the ribs have been completely glued, the aluminum pipe is covered with thickened epoxy resin or UHU Endfest 300 glued. Roughen and degrease well beforehand!

Check the 90 ° angle to the end rib A9 again beforehand

Now the upper planking can be spotted on the ribs at the back.

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Fixing and anchoring the upper planking

Then turn around and glue the ribs from the back to the stile and to the stile

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Glue the upper planking with the ribs up to the spar flange, the inner surface is on the back

Now, through the gap shown in the following picture between the bar on the auxiliary nasal
te and the top cladding glued the upper cladding to the ribs. Here recommends
the use of thin cannulas and the use of the fluidity of the superglue.
The auxiliary leading edge and the upper planking are only glued in the last step.

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Glue the upper planking to the ribs

The nose can now be ground flat from the front down to the auxiliary leading edge and then the 4 mm leading edge can be glued on.

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Planking sanded flat with the auxiliary leading edge

Now the spoiler or the brake flap can be installed.

Start with the lower stop made of balsa 1 mm.
The rear end is made with the 3x3 mm balsa strip, on the side with the next to the spoiler.
made 3mm boards.

Adjust the spoiler according to the cutout, leaving a gap of at least 0.5 mm all round
makes sense!

Fix the spoiler with masking tape and sand according to the profile.

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Lower flap stop fitted

Back and side closure

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Fit the flap

Now the 4 mm leading edge is glued on with superglue.

Glued and fixed leading edge

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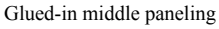
Now the middle paneling made of 1.5 mm balsa can be glued in.



Glued-in middle paneling

The cable entry is glued to the underside of the central rib

Cable entry

2.3 Fitting and articulation of the flap

The 3 mm Ø magnets are glued into the spoilers in the prepared places in the corners. Grind magnets to do this

Insert the spoiler in the inner wing and at the corresponding point in the lower flap stop transfer the position of the washers. Countersink and glue panes.

Flap with built-in magnets

The spoiler servos are provided with a long servo lever and neutral or end positions
to adjust.
Then tape with masking tape or shrink in with shrink tubing, roughen and behind
Glue the spar web to the upper planking. The extended servo lever is used to attach the flaps
kung, a control horn is not required.

Linkage of the brake flap to the finished foiled surface

Cable routing in the wing

2.4 Structure of the central wing

The structure of the central wing is analogous to that of the outer wing and inner wing.

The lower spar strap (pine ledge 4x2 mm) is flush with the 1.5 mm balsa for the lower plank
kung glued.

Now remove the ribs from the lasered board and sort them according to size, sand the bars.

For each middle wing, six 2.5 mm ribs made of balsa B3 to B8 and two 3 mm ribs are made
Poplar plywood B1 and B2 required as a finishing touch to the inner wing. You will be using each one first
Glued a drop of superglue to the spar web B.

No spar web is installed on the outer rib field B7 to B8, the plywood will be used here later.
binder for the outer wing in

Important: Use the angle template to set the outer ribs B1 at 5 ° and B8 at 6 °

Grind the upper spar strap, align it straight, glue the bars and spar straps.
Remove from the building board and glue the front ribs to the planking.

Glue the end strip from below.

Glue on the auxiliary leading edge made of 2 mm balsa and sand.

Apply the top 1.5 mm cladding in the same way as the inner wing. First at the top of the ribs
score, then turn the wing over, glue it against the ribs and the spar strap, from the front through the
Glue a gap on the ribs, straighten the inner wing and the lower spar strap, weigh down
and glue the upper planking against the 2 mm strip on the nose.

Sand flat at the front, apply 4 mm leading edge.

Attention: Only minimal twist (set) of max. 1 mm!

Innermost rib B1 with 5 ° inclination (ignore reference to plan!)

Finished middle wing

2.5 Structure of the outer wing

The structure of the outer wing is analogous to that of the inner wing and the central wing.

The lower spar strap (pine bar 4x2 mm) is flush with the 1 mm balsa for the lower planking glued.

Now remove the ribs from the lasered board and sort them according to size. Grind the bars.

Five 2.5 mm ribs C1 to C5 and one 5 mm rib C6 are required for each outer wing. she
are first glued to the spar strap with a drop of superglue. The edge arch
C7 will be attached later.

No bar is installed on the inner rib field C1 to C2, the plywood connector will come here later
inside.

Important: Use the angle template to set the inner rib C1 at an angle of 6 °!

Grind the upper spar strap, align it straight, glue the bars and spar straps. From the building board
take and glue ribs to the front with planking.

Glue the end strip from below.

Glue on the auxiliary leading edge made of 2 mm balsa and sand.

In order to be able to round off the edge arch at the nose according to the construction plan, a three-
angular filling block with a leg length of approx. 20 mm on the end rib C6 and the lower one
Planking can be glued. Then adjust the block to the profile.

Then the upper 1 mm cladding is applied in the same way as the inner wing and middle wing.
First touch the ribs at the top again, then turn the wings over against the ribs and the
Glue the spar strap, glue it from the front through the gap onto the ribs, the inner wing and the lower spar
Align the belt straight, weigh it down and the upper planking against the 2 mm strip on the nose
glue.

Sand the front flat and apply the 4 mm leading edge.

Attention: Only minimal twisting (offset) in the outer wing max .: 1.5-2 mm

Shell outer wing, note the inclination of the rib C1

Outer wing roughly sanded

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2.6 Edge arch

Sand the planking flat with the end rib C6 and glue the edge curve C7 and
Sand down according to plan.

The span can be "finely adjusted" with the edge arches.

So the surface can be assembled, the span measured and if necessary with a little balsa on the outside thickened or sanded from the edge ribs.
In accordance with the competition, max. 2 m projected span.

2.7 Sanding the leading edge

Now the leading edge can be sanded. Here it is essential to take special care and
Tolerance must be taken, since the leading edge of the flight characteristics and especially the performance of the
Significantly influenced the aircraft. The bar attached at the front becomes tangential to the top and bottom
Planking sanded at the front. Then the nose is rounded with the help of the nasal template.
det.

The templates are assigned to the ribs (e.g. A3 matches rib A3, etc.)

Sanding the leading edge and checking with a template

2.8 Bonding the middle wing and outer wing

After sanding, the middle and outer wing are joined together. That's what the
Plywood connector needed. It must be in the end ribs B8 and C1 between the spar chords
a standing slot with about 1.5 mm can be cut.

Then the connector is fitted. It should be noted that the connector faces outwards
is less high. Further inside, the connector may have to be sanded down a bit.

It is very important that the connector is inserted easily (without breaking any glue points on the stile)
can be.

Possibly. Cut to length, both edge ribs should be in contact without a gap. When gluing, it is important that the
both ribs at the bend are exactly congruent and no height offset is
is recognizable.

The bottom of the connector should be against the bottom bar.

The V-shape between the middle and outer wing is 12 °. From balsa remains on the edge arch a lower
create a position and ensure that both flat ears are aligned exactly the same way.

Before gluing the middle and outer wings

Finally, the connectors and the spar straps with epoxy resin or Uhu Plus Endfest 300 (if necessary) thicken slightly) and glue the wing parts together.

Glued inner and outer wing

After hardening, the ribs now lying next to each other can still be fixed with superglue
be glued. Then the two wing pieces can be ground against each other.

Glued outside area from above

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2.9 Joining of the inner wing and the middle wing

Now the connectors can be cut to length and fitted accordingly. Both edge ribs A9
and B1 should fit without a gap. Possibly. regrind.

Anti-twist device / locking

Cut 4 pieces approx. 1 cm long from the 3 mm CFRP round material and cut them to length at one end
round off.

Insert these into the holes provided in the edge rib of the center sash. Given-
if something should be worked out. Do the same for the edge ribs of the inner wing. Now combine areas
so that the CFRP dowels inserted in the center wing are just about at the holes in the center
center the wing. Then carefully fix it with superglue, do not stick to the inner wing. Area
Take apart the pieces and glue them back on.

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3 construction section tail units

parts list

Type	number	material	use
Laser parts	1	4 mm balsa	Tail units and arches

3.1 Structure of tail units

The tail unit can be assembled using the part numbering according to the construction plan.

Rudder glued

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Vertical stabilizer before sanding

Elevator before blending

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3.2 Grinding of the tail units

Rudder

First sand the glued parts flat on both sides (remove adhesive residue). The rudder part of the side
Grind the rudder down to the end flag down to about 1.5-2 mm. The rudder can also go up
further down to about 3mm.

Mark the center on the damping part of the vertical stabilizer. Now the nose can be ground elliptically
become. To do this, lay the damping raft flat and first very flat, then slowly
work forward at the angle, turning the tail unit whenever you sharpen
and pay attention to the symmetry (mark in the middle). The mark was last dragged away.
fen. Now sand the rudder and the damping part against each other.

Now the slope for the hinge of the rudder unit is ground into both sides. 30 °
It should be a rash.

Elevator

The center of the horizontal stabilizer is also marked at the front and, as with the vertical stabilizer, is elliptically
grind.

Then the framework is ground down on one side (on the top) to 2mm. To
outside can be thinned to 3 mm. The resulting curvature is intentional and serves in the
Slow flight positively affects the flight characteristics. The horizontal stabilizer will be in the position in which it is now
sanded was mounted on the model.

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Grinded tail

See also grinding instructions!

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4 Hull construction phase

4.1 Material for the hull

Type	number	material	use
Laser parts	1	0.8 mm birch plywood reinforcements hull	
	1	2 mm birch plywood	Reinforcements of the hull, frames, servo boards
	1	2 mm balsa	Hull side panels and bottom
	1	6 mm balsa	Fuselage nose + fuselage pipe linings
	1	3 mm balsa	Spar webs B + C, material for padding tion
	1	3 mm poplar plywood	Nose templates, angle template 5 ° + 6 °, ribs A8, A9, B1, B2, trunk pipe supports.
Milled parts	1	1 mm GRP black	Pendulum horizontal stabilizer, control horns
Afford	1	3 x 3 jaws	Reinforcements of the hull bottom
Linkage	2	Bowden cable tube	Linkage height + side
	1	0.6 mm steel wire	Linkage rudder
	1	0.8mm steel wire	Elevator linkage
Small parts	1	CFRP tube, conical 660 mm	Fuselage tube

2	2 mm CFRP pins	Anti-twist protection of the horizontal tail unit
1	Steel wire 1 mm	Stock pendulum stabilizer
1	High start hook adjustable	Fully assembled
1	M4x10 nylon screw	Attachment of horizontal stabilizer
1	M4 nylon nut	Attachment of horizontal stabilizer
1	Nylon plug Ø 5 mm	Lock lead chamber

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4.2 Structure of the front part of the fuselage

First, the side walls and reinforcement parts are cut out and flush with the contour.
grind.

Gluing the fuselage side panels

Now the 0.8 mm thick plywood reinforcements and the edge reinforcements made of 2 mm
Plywood glued to the two 2 mm balsa side walls with white glue or superglue
become.

The contour is flush with the top.

Attention, glue a left and right side of the fuselage = the reinforcements must be left once and stuck once on the right!

The same is done with the bottom of the fuselage and its 0.8mm plywood reinforcement.

The tabs of the frames can be used for alignment (do not glue yet).

Note: Due to production, 0.8 mm plywood is often oversized. Check the strength later test before gluing the frames. By carefully sanding the thickness, the be reduced accordingly.

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Fuselage frames and frame reinforcement (frame 2 - wing attachment)

Shorten the fuselage tube to 660 mm at the thicker front end

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Roughen the area for bonding and then degrease with acetone or brake cleaner!

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Frames on the first side wall (only fix, do not glue)

Before gluing the two side parts of the fuselage over the frames, they are standing on the straight building board aligned exactly in a straight line.

Do not forget when inserting the ribs on the wing mounting plate!

The part is only glued later, however, when the wing with the locking bolt is attached to the Trunk is adjusted

The conical CFRP fuselage tube can be aligned at the points indicated in the plan using the attached teachings are supported.

Then fix the ribs on the side parts with superglue.

Caution, do not glue the CFRP fuselage tube yet! The pipe is later installed with the surface surface exactly aligned to the tail unit!

The next step is to insert the bottom of the fuselage and to make sure that the fuselage is symmetrical again. checks.

Fix the bottom of the fuselage with superglue and check the symmetry again if necessary, now you can to be corrected after the final gluing!

After a successful check all parts with thin-film. Glue the superglue from the inside, for that the creeping ability of the adhesive is used.

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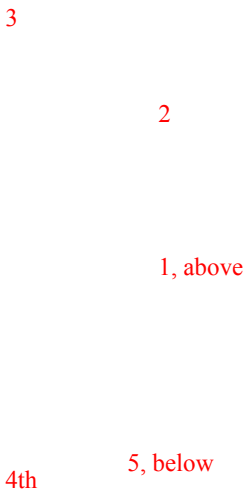
Insertion of the wing mounting plate in the fuselage. but not glued!



Laser parts fuselage nose and fuselage tube cladding

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Fuselage nose parts are glued in ascending order from top to bottom (opening for lead chamber must be on top be)

The fuselage nose is glued with white glue or superglue

Grind the back of the fuselage nose flat and then together with the upper front fuselage cover glue to the fuselage.

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Glued-on nose and upper front fuselage cover (Attention, picture shows still vertically glued fuselage nose from the Pre-series)

4.3 Surface locking

In the rear area of the center rib of the surfaces, the hole for the screw connection with the
Hull made according to plan and hardened with superglue. Now the inner wing with the
Screw the hole you just made to the fuselage. Align the sash straight, here e.g.
from both ends (either trailing edge or leading edge) of the inner wing to the end of the fuselage tube
res can be measured.

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Align the wing

Now use a 5mm drill to mark the hole from the front through the hole in the bulkhead 2.
Remove the surface and first drill the hole with a small drill, then gradually open it
Drill out 5mm (4 cm deep). Cut the 5mm log to length so that it protrudes approx. 1cm, round the front
Glue the and into the surface with epoxy or white glue.

Glued-in fastening dowel of the surface

Now the position of the wing mounting plate with the wing on top can be changed again.
are checked and these are then glued in. With thin superglue over the
Glue the entire length right and left to the side wall of the fuselage. This part becomes strong
stressed and must be glued very carefully!

After hardening, the conical CFRP fuselage tube is prepared for the vertical stabilizer.
ridden slot exactly aligned to the mounted surface.

To do this, insert the rudder unit into the slot and fix it with adhesive tape. The rudder must
are exactly 90 ° to the wings. Check several times and attach the fuselage pipe to the last bulkhead 5
fix.

After dismantling the wings, carefully glue the fuselage tube to the two frames.
Next, thread the fuselage pipe cladding onto the CFRP fuselage pipe and glue it.

Fuselage linings before sanding

Fuselage finally glued

Finally, the CFRP fuselage tube is attached to the side of the fuselage with thickened epoxy resin. walls glued.

For the Bowden cables, suitable approx. 2mm wide slots have to be milled into the CFRP fuselage so that they can be directed to the outside world.

Thread the Bowden cables for the elevator and the rudder.

The steel wires can be pushed in to ensure a straight course in the fuselage and fixed with magnets. Glue the Bowden cables with superglue. For this the flowable exploit the ability.

Gluing the Bowden cable tubes - fixed with magnets

Now the top of the fuselage is padded and glued in the rear area at least up to frame 4.

Then finish the fuselage cover. In addition, a tongue made of plywood 0.8 mm with a length
ge of approx. 20 mm. The width should correspond exactly to the inner width of the fuselage so that the
Fuselage lid cannot slip sideways. Stick the tongue together.

Glue in a 2 mm plywood reinforcement inside for the closure at the back in front of frame 2 and that
Drill a hole for the transom (1 mm CFRP milled part) and then mount it. See fuselage side
view!

Upper trunk lining

Sanded back hull

Finally, the adjustable high-start hook is completed and glued in place

The items

Glue 1mm plywood counter plate to 3 mm plywood, insert M3 nut in counter bearing.
Then screw the high-start hook into the front hole and unscrew it again. The resulting thread with thin.
Post-cure superglue. After drying, screw in again and thinly with a drop. Superglue against
secure twisting. Then finish assembling.

Pre-assembled adjustable high-start hook

High start hook (temporarily dismantled and glued into the fuselage floor)

X-dream

4.4 Sanding the hull

The edges can now be rounded according to section AA. The nose is first flush with the trunk
Walls sanded, then rounded according to the construction plan.
Pay attention to the rule-compliant nose radius of at least 5mm.

Smooth transition between trunk and trunk tube

Roughly polished front part of the fuselage

4.5 Assemble the pendulum:

Milled parts pendulum rudder, control horns, cabin latch and washer elevator (can be used for reinforcement if necessary become)

Carefully cut out the GRP parts with a knife and plaster the bars.

Separated milled parts

Note: Small tolerances in the milled GRP parts are unavoidable. To get straight to the Linkages to avoid play, some holes are made with negative tolerances and must need to be expanded a little if necessary.

The completed parts of the pendulum (not yet glued)

Grind and degrease all adhesive points!

Screw the rocker onto a small piece of scrap wood with a corresponding hole that is
serves as a convenient handle early on. A piece of cling film placed in between prevents it
unwanted sticking. Lightly oil the screw. Put the bearing together in the same way. All
Fix parts with a few drops of superglue.

X-dream

After hardening, the cutouts in the Bowden cable tube shown in the last picture can be used for
the camp can be made. The position of these recesses is indicated by the markings
specified on the mounting plate.

Assemble the pendulum and bearing on a trial basis and check the bearing for ease of movement. The camp itself consists of the enclosed 1.0mm Ø steel wire.
If everything fits, dismantle the bearing and pendulum again and finally all parts with seconds
Glue on glue.

Pendulum mounted with bearings

Finally, insert the 2 mm Ø CFRP rods (anti-twist device) into the 2 mm holes of the pendulum and let it protrude about 4 mm above and also glue with superglue.

The glued pendulum is now mounted. To do this, the inner wing is screwed onto the fuselage and put it upside down on the building board. The elevator screwed to the pendulum will also placed with the top on the building board and the mount with a clamp on the fuselage attached. Approx. Take into account a distance of 5 mm to the damping fin of the vertical stabilizer and right orientation - the bearing is at the back - pay attention!
After the alignment, the two recordings (previously sanded and degreased the adhesive points) glued to the fuselage pipe. Gluing either with super glue or epoxy resin.

Secure the hinge pin on the outside with a small drop of superglue.

X-dream

5 completion

5.1 Stringing

After the final fine-tuning, the plane can now be covered. Here are a few more tips:

The use of ORACOVER® hot-seal adhesive is recommended in the plug-in area. It is enough, if the front sides of the respective outer ribs on the inner and middle part as well as the planking, nasen and trailing edge is coated over a width of approx. 15 mm. The paint increases the adhesion clear and prevents the film from sticking when the adhesive tape to secure the wing replacement.

Thoroughly clean all parts of dust. To do this, carefully wipe with a damp cloth or with Blow off compressed air.

Do not iron too hot. We iron Oralight at 130-150 ° C. Only briefly with stubborn wrinkles hot spots.

Always iron the underside of surfaces first. Then the top. Gives more beautiful and aerodynamic mixed better overlaps. We usually score 4th grade first when ironing a surface Corners, then all around. Then iron firmly all around and clean the edges. Then the upper side ironed. The procedure is about to begin. Only now do the surfaces above and below become solid ironed. Make sure that the film sticks everywhere on the cladding.

On the end strips, iron the film firmly, also at the rear edge. Overlap the top and bottom. This prevents the film from peeling off during tensioning.

The spoiler flap is ironed all around and attached to the top with a Tesa strip.
beat.

5.2 Fuselage installations

The servo board must be glued into the fuselage. If you want to add ballast later, you should
be careful that the servo arms do not prevent the tube from being loaded and unloaded.
The enclosed servo boards fit all servos as recommended. Who builds wider servos,
should put it a little diagonally.

With the correct positioning of the servo board, the center of gravity can be roughly adjusted in advance.
provided and thus possible. unnecessary lead addition can be prevented. To do this, install or pro-
Attach visually and adjust the center of gravity by moving the servo board. Subsequent
stick together!

The rudder is connected to the servos using 0.6 or 0.8 mm spring steel wire.
To do this, roughly cut the steel wire to length and bend a Z at one end.
Insert from the front into the Bowden cable tube Bring the servos into neutral position!

5.3 Assembly of the vertical stabilizer

The rudder unit is hinged on the side of the linkage with tape. Now the SLW in the
Insert the slot in the back of the fuselage tube, remove the iron-on film at the gluing points,
without damaging the wood.

Now the SLW can be glued in vertically, the hinge line should be 90 ° to the longitudinal axis of the fuselage
stand.

5.4 Linkage of the rudder

Glue the included control horn in line with the Bowden cable tube. The 0.6mm spring steel
Bend the wire approx. 1cm long by 90 ° and thread it into the Bowden cable tube. The bent part
hang the piece of wire into the control horn. A short piece of the Bowden cable
Tubes can be glued to the open end to secure.

5.5 Assembly of the horizontal stabilizer

Check the length of the M4 screw and cut to length if necessary. Grind the 2 pieces 2 mm GRP rods,
and make sure they fit into the recesses in the pendulum, then in the pendulum pad (not
glue into the rudder) from below so that they protrude approx. 1.5 mm below. At the top should-
When the horizontal stabilizer is installed, the ends are flush with the surface.

5.6 Linkage of the horizontal stabilizer

Bend a Z into the 0.8 mm spring steel wire with flat-nose pliers. The hinge pin from the pendulum
to take. Attach the Z control horn and reassemble and secure the hinge pin.

X-dream

6 setting data

Now the X-dream should be ready for the first flight. But first the setting data:

- Center of gravity: for the first flight 76 - to 78 mm behind the leading edge, this can be done later move 2 mm backwards.

  Attention! It makes a big difference which tool is used to determine the center of gravity becomes! With the classic methods such as mechanical balance scales, sharp supports, Fingertips, etc., the focus may be. lie up to 4 mm further forward!
  Which by us for max. Power determined center of gravity of just under 80 mm was electronic balance scales. This value also coincides with others
  electronic balance scales such as those from Mahmoudi Modellsport

- Rudder: As much as possible, at least + 30 ° and -30 °
- Elevator: at the end edge 10 mm up, 7 mm down
- Elevator compensation for the flap: + 2 to 3 mm.

Elevator zero position: Bearing over the surface from the front. The horizontal stabilizer should now be a little from below be visible.

6.1 First flight

The first flight is best done on a meadow. After a few tosses it should be comfortable

Find flight setting and center of gravity.
The center of gravity can be finely adjusted with lead shot in the nose.

6.2 Settings / flight tests

The adjustable high-start hook can then be adjusted approx. 1 mm in front of the center of gravity. Now the plane can be started with the rubber for the first time.

The X-dream can now be further adjusted. You can still fine-tune the focus
animals, and the rudder deflections and elevator admixture on high to the spoiler according to your own Adjust at will.

The best way to determine the exact center of gravity is with the intercepting bow. First of all in slow trim flight straight. Then press at a 45 ° angle and move the stick to the neutral position
bring. During this maneuver, the flier should follow the flight path with a slight upward arc change or stay in the incline. Do not undercut!

Adjust the elevator proportioning to the airbrake at a higher height.

If the basic settings are correct, the high-start hook can be optimized. In addition the high

X-dream

Adjust the start hook in the subsequent take-offs so that the aircraft is safe without pumping upwards flies. To do this, push the hook backwards piece by piece and very carefully. Should the plane pump pen, push the high-start hook forward a little.

6.3 ballast

If you want to use the X-dream for pure recreational flying, you don't need any ballast.

In competition, however, it makes sense to adapt the model weight to the weather conditions to be able to.

A 10 mm round material is used as ballast. Brass or copper brackets are best
support rods or copper pipes filled with lead. The length of the ballast set should be approx. 235 mm be.

As an accessory you will find the matching ballast set with 3 different weights of 52, 94 and 165 g at https://zeller-modellbau.com/catalogsearch/result/?q=133896

The ballast is used in such a way that the center of gravity of the ballast is exactly in the flown Focus is sitting. The fixation takes place either with a locking mechanism or with the Wing mounting screw. The screw is cut to length so that it is
the ballast jams on the surface. Cutting to length must be carried out very carefully and at your own risk, so that the wing mounting plate is not overstressed and thus "blown off".

Your X-dream will fly straight away - we promise!

I wish you lots of fun flying, extensive thermal flights and successful participation
the RES competitions!

Always keep your X-dream in sight!

All the best and have fun!