E-APEX by Holzmodellbau Schweiger assembly instructions (version 3.1)

Some important notes in advance:
Please read these assembly instructions and safety precautions carefully before starting assembly and proceed step by step.

Ensure that you understand and can follow the individual construction steps. This kit is suitable for children aged 14 and above. Construction and operation only under the direct supervision of adults.

The flight model is suitable for use in RES competitions and for slope and thermal flying in calm weather.

Caution: High flight speeds are not permitted. At high altitudes and in windy conditions, the flight speed may not be correctly estimated.

The manufacturer accepts no liability for damage caused by non-intended use.

A non-intended use is, among other things, to assemble the kit differently, or to use the flight model differently than it is described in this assembly instructions. The building instructions and further information can be found on our website:
www.holzmodellbau-schweiger.de

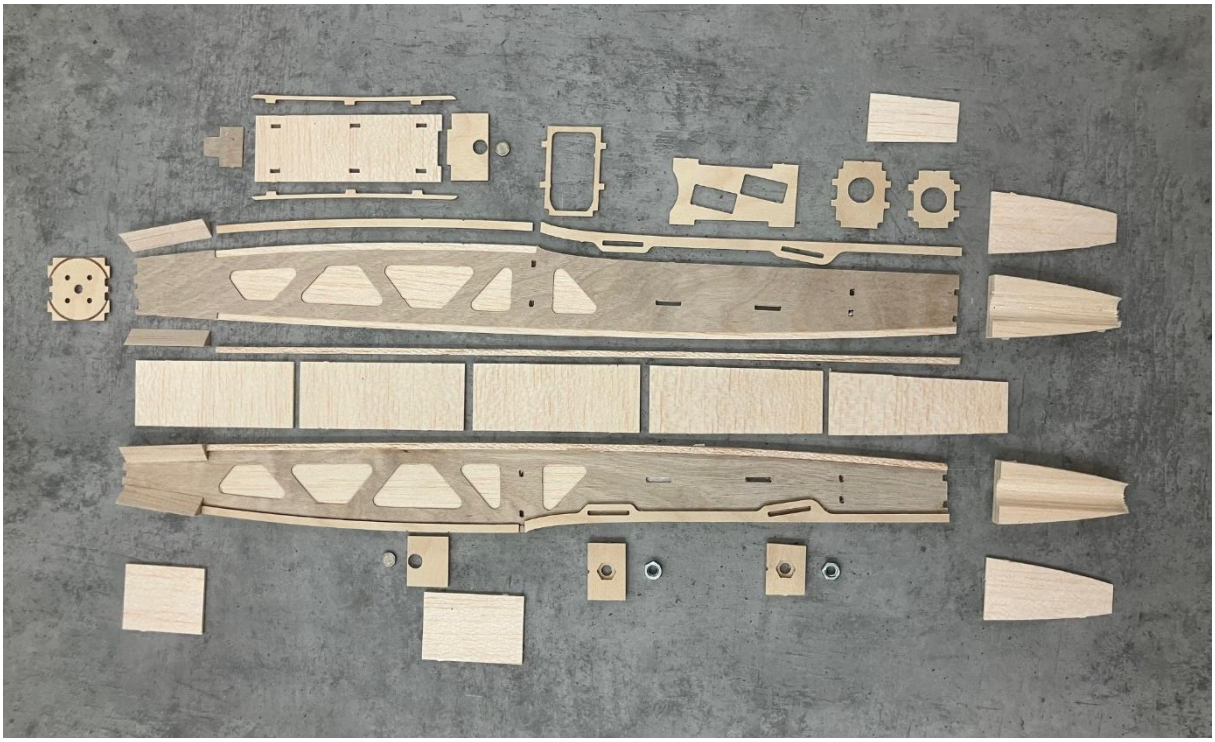
When building the model, observe all safety regulations when handling tools and adhesives. We use thick and thin superglue for the assembly of the model, unless otherwise specified. Attention must be paid to the clean bonding of the components.

- The operation of model aircraft of this type requires model aircraft liability insurance.
- Do not operate the model in adverse weather conditions (thunderstorms, strong winds, etc.)
- Do not operate the model near power lines or airports.
- Do not operate the model if it itself or the built-in components are damaged.

We will be happy to answer any questions you may have:
holzmodellbau-schweiger@outlook.com

Description fuselage:

Picture 1 shows all the parts that are required for the construction. The parts are arranged in the picture as they are installed. The 0.6mm plywood reinforcement R2 is already glued to the balsa side R1 with white glue.

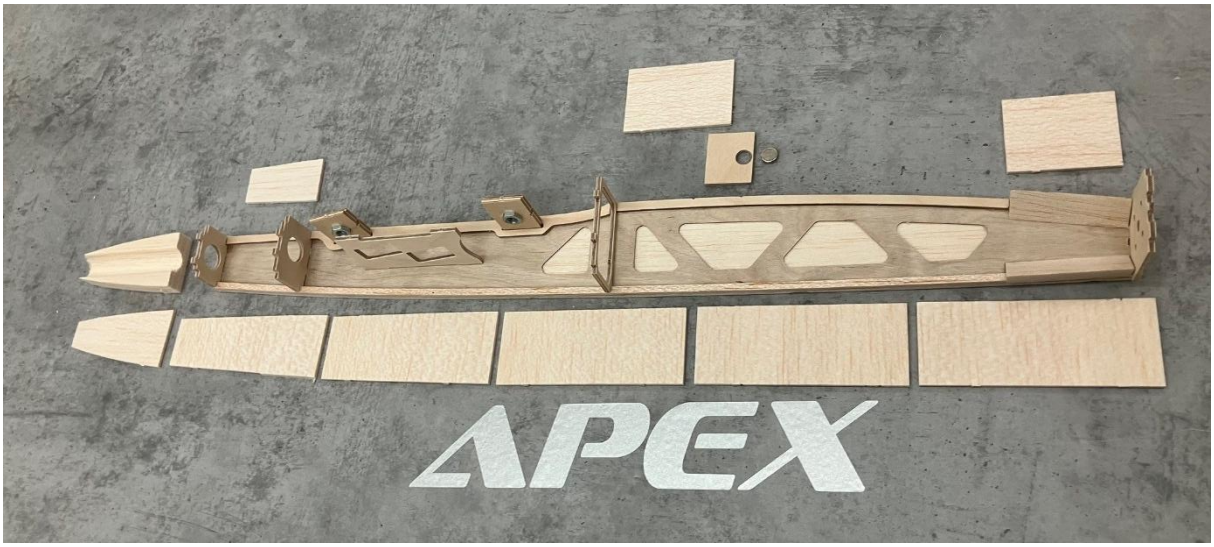


Picture 1

As you can see in **Picture 2**, we use a roller for this. Then press the parts together for several hours. Care must be taken to build a right and a left side panel. The white glue gives the time needed to align the parts exactly. The roller allows for an even, thin application.

Picture 2

Next, continue with the balsa triangular strips, which are cut to shape at the nose of the fuselage as shown in **Picture 3**. It is important that the strips fit precisely against the motor bulkhead.
In the next step, glue the balsa strip R24 flush along the bottom edge of the fuselage sides. The balsa strips are located on the 3 mm balsa sheet of wing ribs A. The balsa strip runs from the triangular strip to the rear end of the fuselage and must be trimmed to length there.
Afterwards, glue the plywood wing saddle flush with the top edge of the fuselage sides. When installing part R3, make sure that any excess glue that may seep out is removed from the slots for the wing bolt mounting.
In the area of the canopy, the two plywood strips R4 can now be glued flush with the top of the fuselage. The two notches on the upper side of the strips point toward the wing and mark the position for part R12.



Picture 3

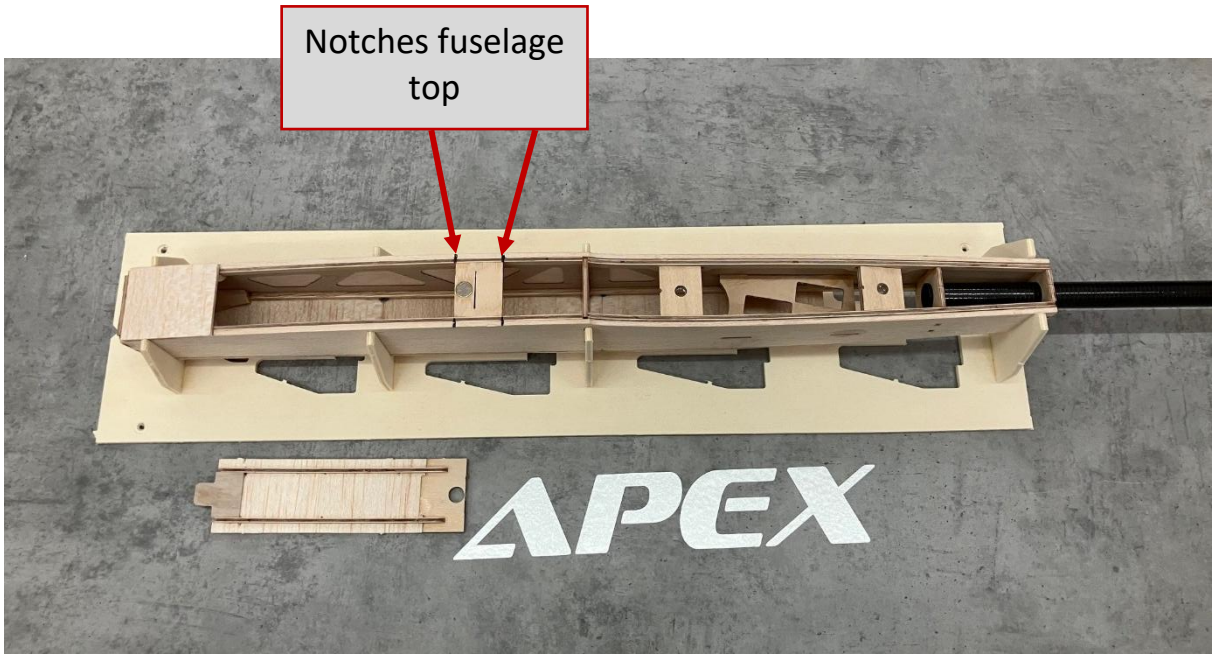
The two M5 nuts are glued into the two 4 mm plywood parts for the wing bolt mounting, R20, from the accessory pack. For orientation, the R20 parts have a notch on the leading edge that points toward the nose of the fuselage.
Tip: lightly sand one side of the nuts first to ensure a secure bond. For this step, we use an adhesive such as UHU Endfest*.

*** UHU Plus Endfest**: *UHU Plus Endfest Dual-Barrel Cartridge 50ml extrudes both parts of UHU's ultra strong epoxy adhesive in perfectly measured ratios from a user-friendly cartridge. UHU Plus Endfest has a working time of approximately 90 minutes. It is solvent free and used in model making, kit building, art and craft projects, repair and restoration.*

The assembly jig made of 3 mm plywood is fitted together and secured on a flat surface. All fuselage parts are assembled and precisely aligned in the jig. When gluing, make sure that the two wing bolt mounts R20 and the fuselage former R9 are not yet glued to the fuselage shell.

Let's continue with the top of the fuselage:
The balsa part R16 is glued in place behind the motor bulkhead. After that, a magnet (7 mm diameter) is glued flush into the recess in the plywood part R12. Part R12 is the counterpart to the magnet in the canopy.

There are two notches on the fuselage sides for orientation in the canopy area. As shown in **Picture 4**, part R12 is glued in flush with the top surface between the two markings at the rear end of the canopy. Make sure that the magnet faces toward the nose of the fuselage.



Picture 4

Canopy:

For the canopy, prepare the parts R14, R11, R17, as well as the two stiffeners R10, as shown in **Picture 5**. First, glue parts R14 and R11 together. Then the two stiffeners R10 can be inserted into the canopy and glued in place. At the front edge, part R17 is glued between the two R10 parts, forming the canopy latch.

Picture 5

The final step is gluing the magnet into the canopy. Make sure to observe the correct polarity.

Part R15 is not glued onto the top of the fuselage yet; more on this later.

The fuselage can now be removed from the assembly jig, turned over, and reinserted with the bottom side facing upward. This allows the fuselage underside to be closed using the balsa elements R21. The exception is the last element in front of the tail boom, which must not be glued yet. Only in this way can the CFK tail boom later be bonded cleanly to the fuselage shell.

Fuselage tube and pylon:
The fuselage tube made of CFK can be wet smoothed with water sandpaper. We recommend a grit of 400 or finer here. For the end of the fuselage, the components shown in **Picture 6** are needed: Four CFRP rods with a diameter of 2mm, two pieces each for the pylon, length 30mm and two pieces for the rudder, length 60mm. In addition, parts P1 and P2 (8mm balsa), P3 (0.6mm plywood) and the M3 nut.

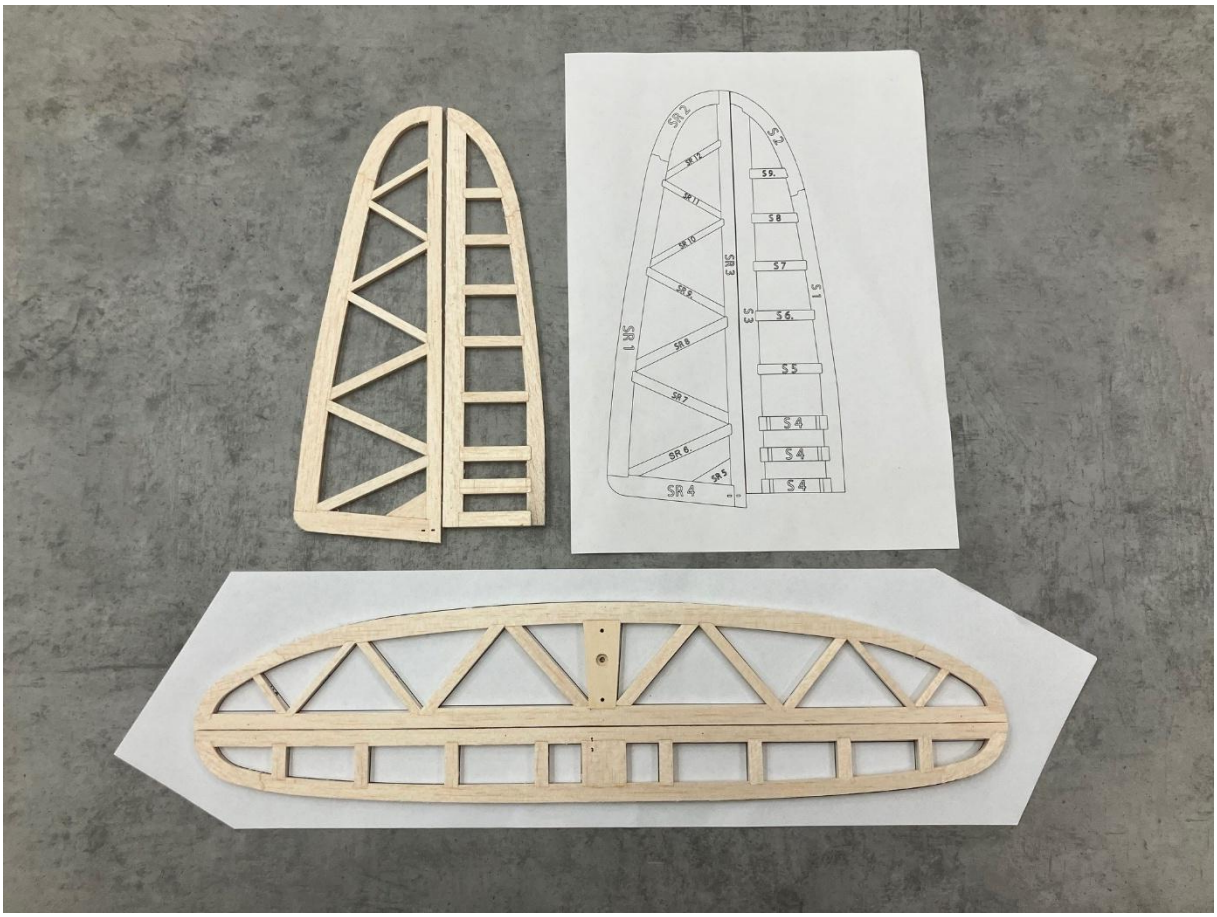
Picture 6

First, the M3 nut is glued into part P2. We proceed as follows: The milling in P2 for the nut is hardened with low-viscosity superglue. Then the nut is pressed into the grooved groove provided for this purpose and secured with some glue.

The fuselage frame R9 is now attached to the fuselage boom. The top of the fuselage tube is the side with the cut-outs (on the left, upper side) for the push rods. Insert the four carbon rods, the two shorter ones are for the pylon and protrude about 19mm upwards from the fuselage tube. The longer carbon rods for the rudder protrude about 48mm upwards from the fuselage tube.
Here, special care must be taken to ensure that the carbon rods align with the center of the axle of the fuselage. Otherwise, the finished tail unit cannot be parallel to the fuselage axis.

The pylon part P1 can now be attached and glued. For the P2 component, make sure that the M3 nut points downwards. Attach component P2 as well and glue it together. Only the component P3 must not be glued yet, as this will only happen later with the elevator.
The ends of the 4 carbon rods, which now protrude from the bottom of the fuselage boom, are carefully ground flat. Care must be taken to ensure that the fuselage tube itself is not damaged by grinding. Because even small damage weakens the hull boom considerably.

Rudder and elevator:
The 4mm balsa board with the parts for the elevator and rudder is needed for construction. The middle piece H3 for the screw connection of the horizontal stabilizer made of 4mm plywood is included in the accessory package. In addition, the three identical components S4 for the rudder are located on the 8mm balsa board. All components can be seen in **Picture 7.**



Picture 7

We assemble the elevator as follows:

- First, we attach the pictured parts for the framing of the tail unit to the blueprint (protected with foil) and glue them with a drop of low-viscosity superglue.
- Then we insert the remaining struts and glue them together as well.

The same procedure can also be used for rudder. Here we first staple the border together and then work our way up from the bottom to the top.

Tip: we harden the holes for the plug-in socket in the rudder. To do this, we insert a greased 2mm drill into the hole and put a drop of low-viscosity superglue on it.

We also explain the structure of a similar tail in detail in our 4th tutorial: **https://www.youtube.com/watch?v=F4erVqr0to4**

In the end, we put the rudder on the fuselage tube and screw the elevator onto the fuselage pylon. To do this, we put a little white glue on the fuselage pylon and glue the support extension P3 on it. Here again, it is important to make sure that the angle of elevator and rudder is exactly 90 degrees.

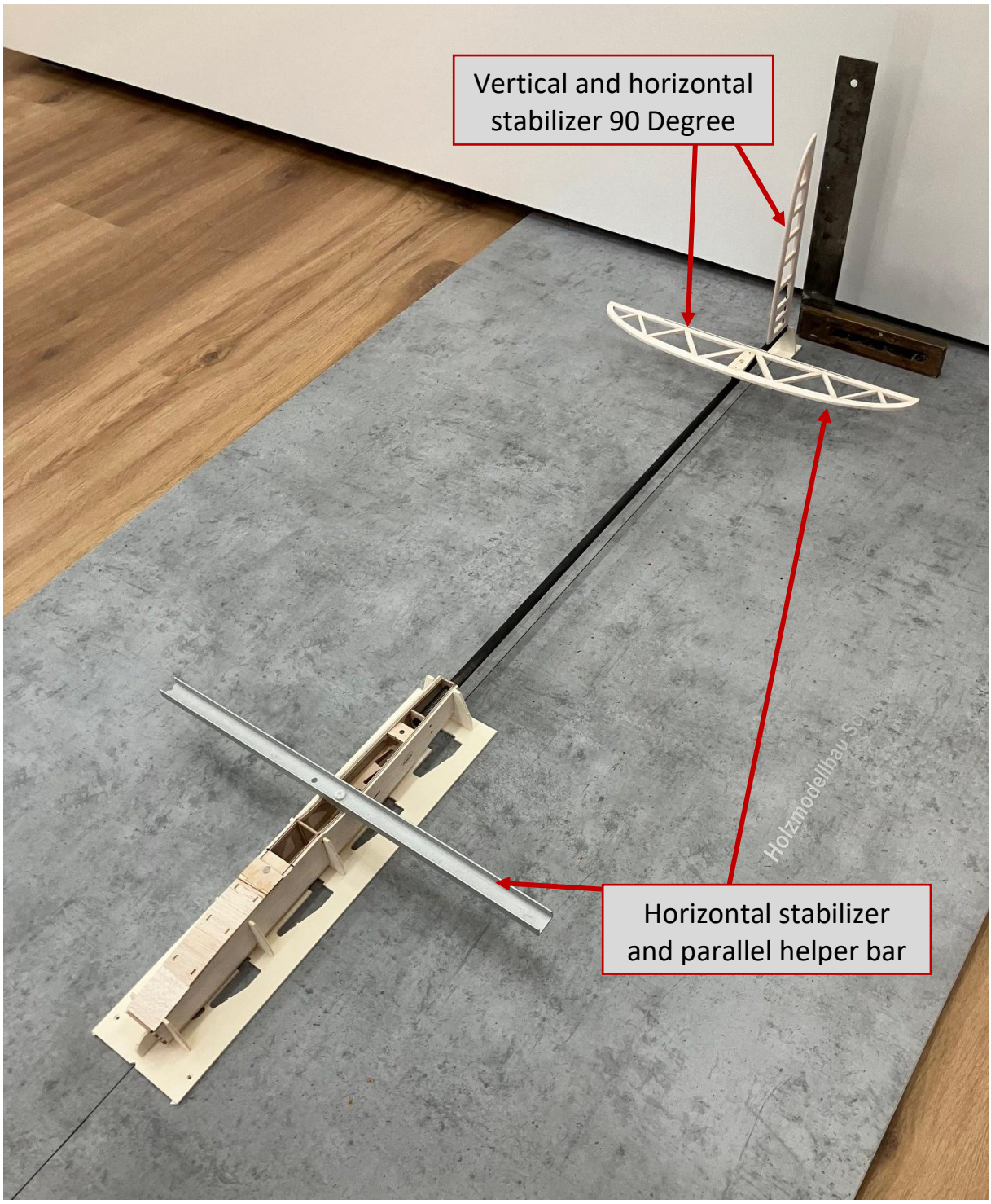
Tip: a lightly greased M3 steel screw helps with gluing so that it does not stick to the thread. We will go into more detail about the sanding of the tail unit in a later point.

Assembling the fuselage:
Now the hull tube can be joined to the hull boat. For this purpose, the surface support is checked again for protrusions to ensure a flat contact surface for the wing center section.

A straight line (centerline) is drawn on the building board, running from the nose of the fuselage to the rear end. The assembly jig is then aligned with this centerline and secured in place. The fuselage shell is inserted into the jig.

A 2 mm balsa strip must be placed on the rear support of the assembly jig, as the fuselage bottom sheeting is still missing at this point. The tail boom is slid into the fuselage shell until it protrudes 1 mm beyond former R8. The fuselage former R9, which was already threaded on in the previous steps, can now be fitted onto the end of the fuselage shell with the marking facing upward. This step is shown in the following **Picture 8.**

The rear support is positioned at the end of the tail boom and aligned with the centerline.



Picture 8

A straight strip with a length of approx. 40cm, at an angle of 90 degrees to the fuselage axis is screwed onto the front wing screw connection (this serves as an aid for alignment).

Now all parts can be aligned parallel to the drawn centerline. The tail boom rests cleanly in the support foot, and the fuselage shell is seated in the assembly jig. The horizontal stabilizer lies parallel to the auxiliary strip that has been screwed in place.

Check the correct alignment again before gluing. The hull must lie in its support without tension. Only a correctly aligned fuselage ensures optimal flight characteristics.

Once the tail boom has been bonded to the fuselage shell, the underside of the fuselage is closed with the final balsa part R21. On the upper side, the balsa part R22 is glued in between formers R8 and R9.

One of the final tasks on the fuselage is forming the transition from the fuselage shell to the tail boom, which is done using parts R19 and R23. These parts are glued together first and then fitted to the rear end of the fuselage.

Grinding of fuselage and tail unit:
When grinding the hull, as just mentioned, we start with the transition from the hull boat to the hull boom. To do this, the hull boom must be taped off to avoid damage caused by grinding. Caution here: if the CFK tube as a fuselage boom is damaged by grinding, a predetermined breaking point occurs at this point.

First, the fuselage end is adjusted to the fuselage contour. We use an abrasive batten with a grit of 150.

Tip: Sanding salts can also be easily built from the balsa residues, to which we glue the respective sandpaper.

To achieve even curves at the desired fuselage edges, we first grind a 45-degree phase on them. These phases are easier to control for uniformity and help us maintain an even radius. Once the desired hull shape has been created, all wooden parts are sanded over again with a finer sandpaper (grit approx. 240) to obtain a smoother surface. Optionally, the underside of the fuselage can also be hardened in the front area with liquid superglue.

To grind out the trailing edge of the tailplanes, we use a special sanding batten, as can be seen in **Picture 9**. Dimensions approx. 25x10cm. The sanding batten is only half covered with sandpaper on one side.

Picture 9

Afterwards, a guideline is drawn on the elevator and rudder along the end bar, in the middle.

As you can see in **Picture 9**, we place the tail on an 8mm thick plywood for elevation. During the subsequent sanding of the tail unit (with the prepared sanding batten), it is now important to make sure that the sanding batten rests on the trailing edge of the empennage and the edge of the table. So, we sand the trailing edge to a point from both sides (approx. 1mm) except for our guidelines. Note: The further away the empennage is from the edge of the table on its elevation, the flatter the grinding angle on the trailing edge becomes.

In contrast to the two trailing edges of the elevator and rudder, which we have just sharpened, we grind the nose strip of the tail units round. To do this, we sand a phase on both sides of the nose strip of the tail that takes up about a third of the wood thickness. This phase, in turn, helps us to grind an even curve over the entire edge arch. When sanding the curve, it is important to make sure that a curve is created at the end. Note: A tapered nose bar of the tail unit has a negative effect on the flight characteristics.

In the end, only the bevel for the rudder deflection is missing. In the elevator, the bevel is located on the underside of the tail, in the rudder on the left side, where the rudder horn will later be located. The level in the elevator must be sufficient to achieve a deflection of 10mm downwards. The rudder should be enough for 40 mm deflection in both directions.

We also explain the sanding of the tail in detail at the end of our 4th tutorial: **https://www.youtube.com/watch?v=F4erVqr0to4**

Installation of the push rod system:
The kit includes etched Teflon push rods with an inner diameter of 0.9mm. These are suitable for a linkage with 0.8mm diameter. For the linkage itself, the two existing 0.8mm steel wires (length 110cm) are provided. As an optional accessory, 0.8mm CFK rods (length 110cm) are also available on request. With this alternative linkage, weight saving of approx. 15-20g is possible.

Picture 10

To achieve a secure bonding of the push rods in the fuselage tube, we proceed as shown in **Picture 10**. One of the two 0.8mm steel wires is inserted into the push rod, which must be about 20mm back at the rear end of the push rod. This protrusion of the push rod over the steel wire is important so that the steel wire is not glued to the push rod later, should superglue escape from the fuselage boom.

Next, the pushrod tube is inserted into the tail boom and fixed to the inside of the tail boom using magnets.

Tip: the position of the pushrod tubes at the end of the tail boom is already defined by the milled recesses. The exit point of the pushrod tubes from the tail boom should be slightly in the upper half of the boom so that the linkage is at the same height as the servo arms.

Now apply approximately 10–15 drops of low-viscosity superglue along the pushrod tube onto the inside of the tail boom. This allows the glue to run down the tail boom along the pushrod tube and bond it along its entire length. For this step, the fuselage must be held vertically during gluing.

Note: it is advisable to place a sheet of newspaper on the floor, as the low-viscosity superglue may drip out of the tube.

Preparation of the trailing edges for the wings:
Before installation, the trailing edges are only adapted to the profile on the upper side and ground to a thickness of approx. 1mm. Here we again use the previously explained method (**Picture 9**) for grinding out the tail trailing edges. It is important to ensure that when grinding the trailing edges for the wing pieces B and C, a left and a right side are made.

The first and last ribs are placed on the trailing edge to mark the end of the ribs on it. Now the front part of the trailing edge that is not sanded out can be glued to our raised underlay with masking tape so that the trailing edge flushes with the edge of the underlay.
For the following sanding, a sanding batten is again necessary, which is only half covered with sandpaper on one side. With the side of the sanding batten, which is covered with sandpaper, the trailing edge can now be sanded evenly. By changing the distance of the pad to the edge of the table, we can influence the sharpening angle.

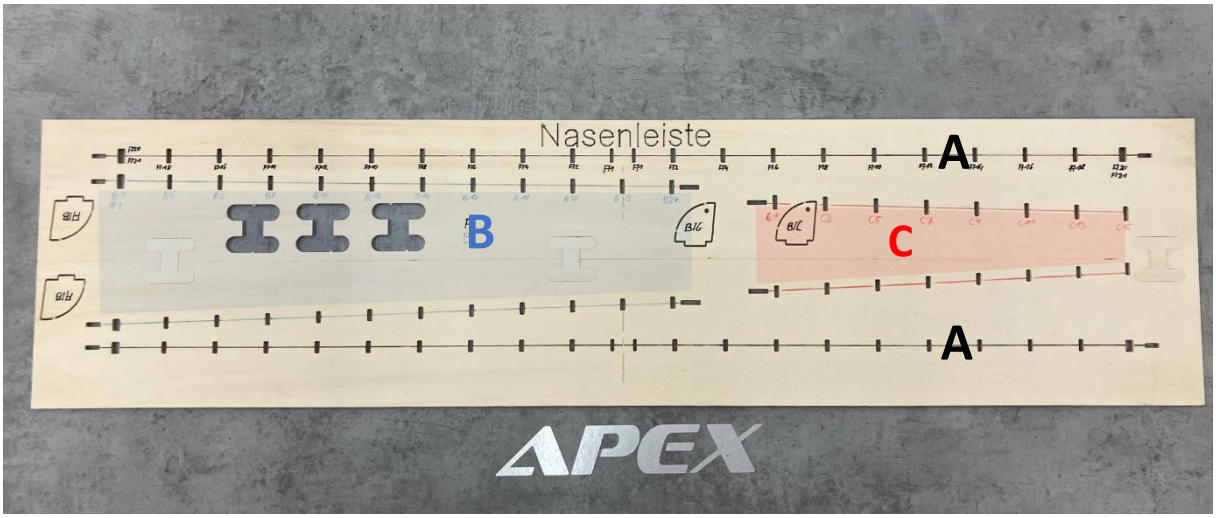
Tip: In our case, the height of the base corresponds to 5mm, so a distance of 5-6cm from the trailing edge to the edge of the table is required.

Another tip: When the trailing edge is almost finished, it is removed from the base and the back 5mm of the top is soaked with low-viscosity superglue. After hardening, it can be finished sanding.

Description of the wings:
Let's start with the slipway for the wings:
For these, we separate out the stops for the individual wing parts A, B, C. The two stops with one bore are for the transition of the wing parts B and C. The four stops without drilling are for the transition of wing sections A and B.
The construction slipway is then checked for possible milling residues in the slots and cleaned if necessary. Prepared in this way, it can be placed on a straight construction board and screwed in place to ensure that the slipway is mounted without distortion and flat to the surface.

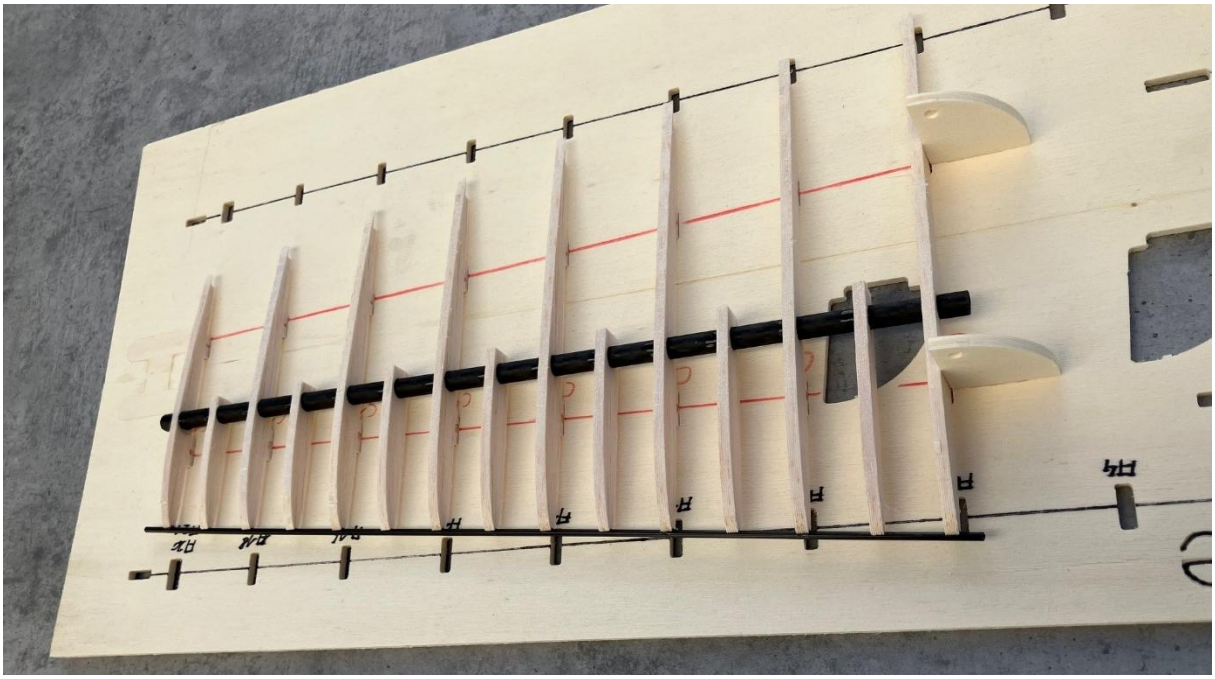
Wing part C:
On the building slipway, we mark the wing area C, because we want to start with it. In addition, the numbers of the individual ribs can also be labeled here. The order of numbering is ascending from the center of the wing. **Picture 11** shows the labeled building board.

The CFK tube (diameter 6mm) is cut to a length of 26cm and cleaned with a grease-dissolving thinner. From the two CFRP tubes (diameter 2mm, total length 70cm) a piece of 26cm is cut for wing part C and a piece of 40cm for wing part B. These cut-to-length CFK tubes are the nose strip for the respective surface pieces.



Picture 11

Now the individual ribs, ascending in order of numbering, can be carefully threaded onto the wing spar. The threaded surface ribs C1-C15 are aligned according to the distance between the construction slipways and carefully inserted into the slots provided for this purpose. The ribs can then be aligned exactly vertically with the rib comb. Make sure that the rib C1 is tilted to 5.75 degrees with the rib stop. This step is shown in **Picture 12** below:



Picture 12

At the end, we check the correct alignment of all ribs again and glue all whole ribs (not the half-ribs) to the tube.

Tip: for correct alignment, we use weights to fix the wing part cleanly. We use a low-viscosity superglue for gluing. Only rib C1 is not yet glued to the spar, as it can be more easily adapted to the following wing part B.

We use the 2mm CFK tube as the nose strip, which is carefully inserted into the milled openings provided for this purpose. First, the nose strip is glued only to the whole ribs. This means that the half-ribs can then be neatly aligned and glued together again with the comb.

Now the wing part C can be removed from the slipway and the support feet on the underside can be removed. The trailing edge is attached to the ribs from below, as the profile of the underside of the wing is straight in the rear area. This flat surface allows the wing part to be fixed on a building board covered with foil. Correctly aligned, the attached trailing edge can be glued to the wing.

Care must be taken to ensure that the rib C1 is glued at an angle of 5.75 degrees. This is ensured if the rib C1 lies neatly against the stop.
For the edge arch, the components C16 and C17 are required. The nasal ridge is removed after rib C13. Component C16 is fitted between the ribs C13 and C15. The half-rib C14 must be shortened accordingly. Then C17 is glued to the rib C15. After sanding the edge arch, the surface part C is completed for the time being, as can be seen in **Picture 13.**
To create the second surface part C, the slipway must be turned. This is the only way to build a left and a right-wing side.

Picture 13

Wing part B:
In principle, wing part B is constructed in the same way as wing section C, with particular attention to the exact preparation of the slipway and subsequent alignment. First, we cut the CFK tube with a diameter of 10mm, as well as the nose strip (CFK tube 2mm) to a length of 400mm. Both pipes are then cleaned with a grease-dissolving thinner. Glue the plywood rib B1 to B2.

Tip: For a precise fit, the two dowel pins can already be inserted into the 2.5mm holes. Make sure that a right and a left rib are built. Then the glued rib B1/B2 can be carefully placed on the spar to check whether the rib can be tilted 5 degrees. If this is not possible, the hole for the spar must be slightly reworked. We also check the rib B25 to see if it allows a slant of 5.75 degrees when attached to the spar. From now on, all ribs can be carefully threaded onto the spar and aligned one after the other. Once all ribs are aligned, all whole ribs are first glued to the spar with low-viscosity superglue. Thread the 2mm CFRP nose strip into the recesses and glue it to the whole ribs as well. The half-ribs now follow suit, which are aligned and glued.

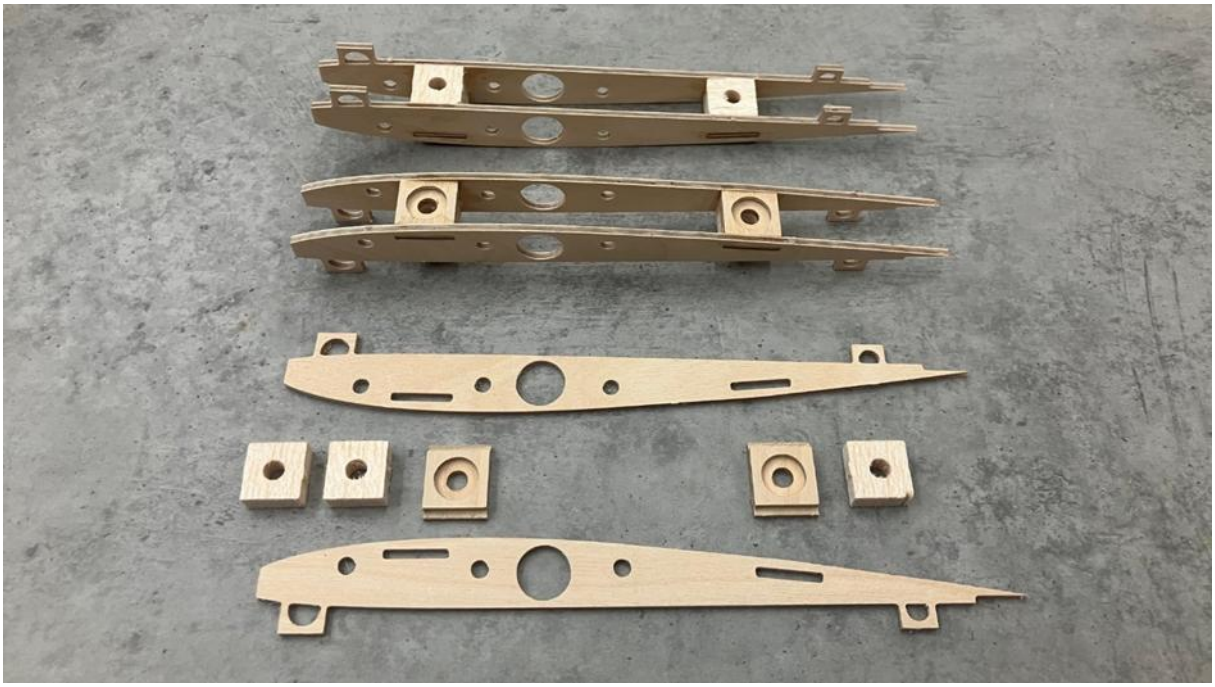
The surface part B can now be removed from the slipway, the ribbed feet can be separated, and the trailing edge can be attached, as shown in the following **Picture 14.**

Picture 14

Wing part A:
Cut the CFK tube with a diameter of 12mm and the nose strips (CFRP tube 2mm) to a length of 725mm. The plywood ribs A21 are glued to the balsa ribs A20 as before in wing part B, again making sure to make a right and a left rib.

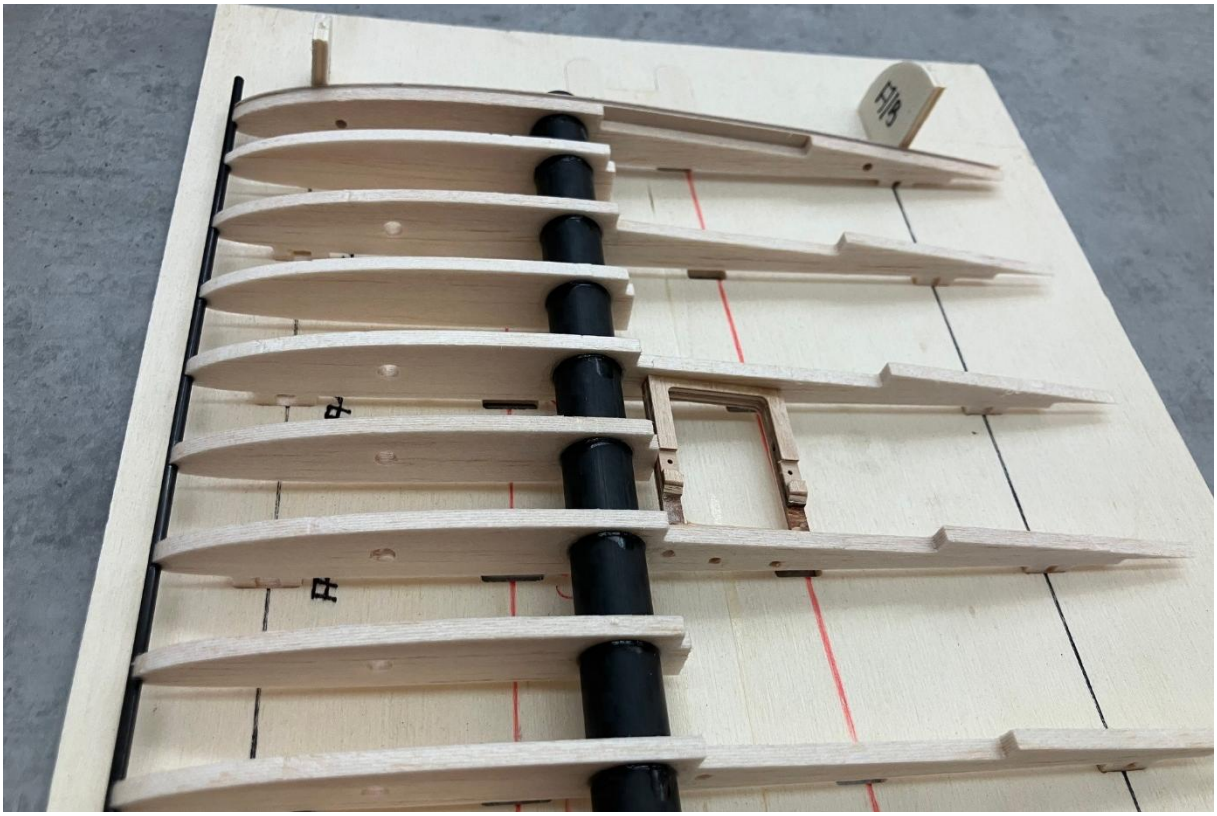
We start with the center piece for bolting the wing to the fuselage. For this we need the two plywood ribs A1, the three balsa parts A24 (6 mm balsa) and the two 4mm plywood parts A30 from the accessories. Parts A30 have a round recess for the screw head of the surface fitting. The two A1 ribs are pushed centrally onto the spar. The two surface screws A30 are inserted between the two ribs and aligned on the construction slipway. Care must be taken to ensure the exact alignment of the ribs, as they must be at right angles to the slipway.

Only then can the components be glued, with the recess for the screws pointing upwards. The components can then be removed from the slipway to glue the A24 balsa blocks under the A30 surface screw. When gluing, make sure that the holes for the screws are exactly on top of each other. The spacer blocks can then be sanded flush with the underside of the wing, as shown in the following **Picture 15:**



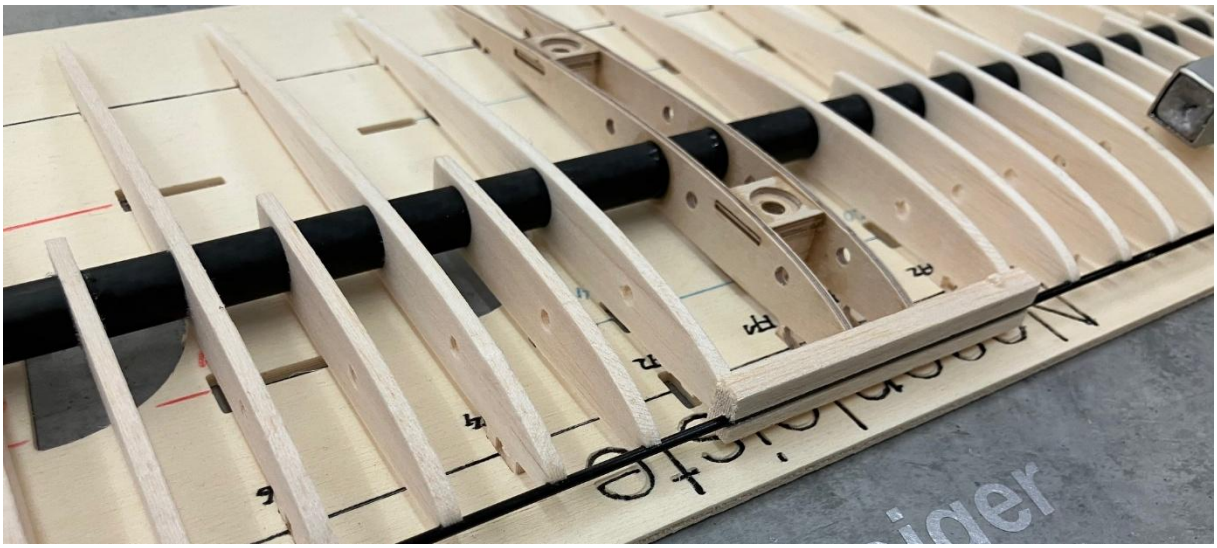
Picture 15

The middle piece for the surface screw connection is then pushed open in the middle of the 12mm CFRP spar. This means that the balsa ribs A2-A15 can then be threaded on from both sides. This is followed by rib A16, for which the servo frame of the accessory package is also required. The servo frame is inserted with its pins into the ribs A14-A16 provided for this purpose. The servo frame is intended for the KST-X06H-V6 flap servo. When plugging in, make sure that the two tenons with 2x2mm are intended for the rib A14 and the two pegs 3x2mm for the rib A16. This means that the servo frame cannot be inserted the wrong way around. Now the remaining ribs A17-A21 can be slid on, as can be seen in the following **Picture 16.**



Picture 16

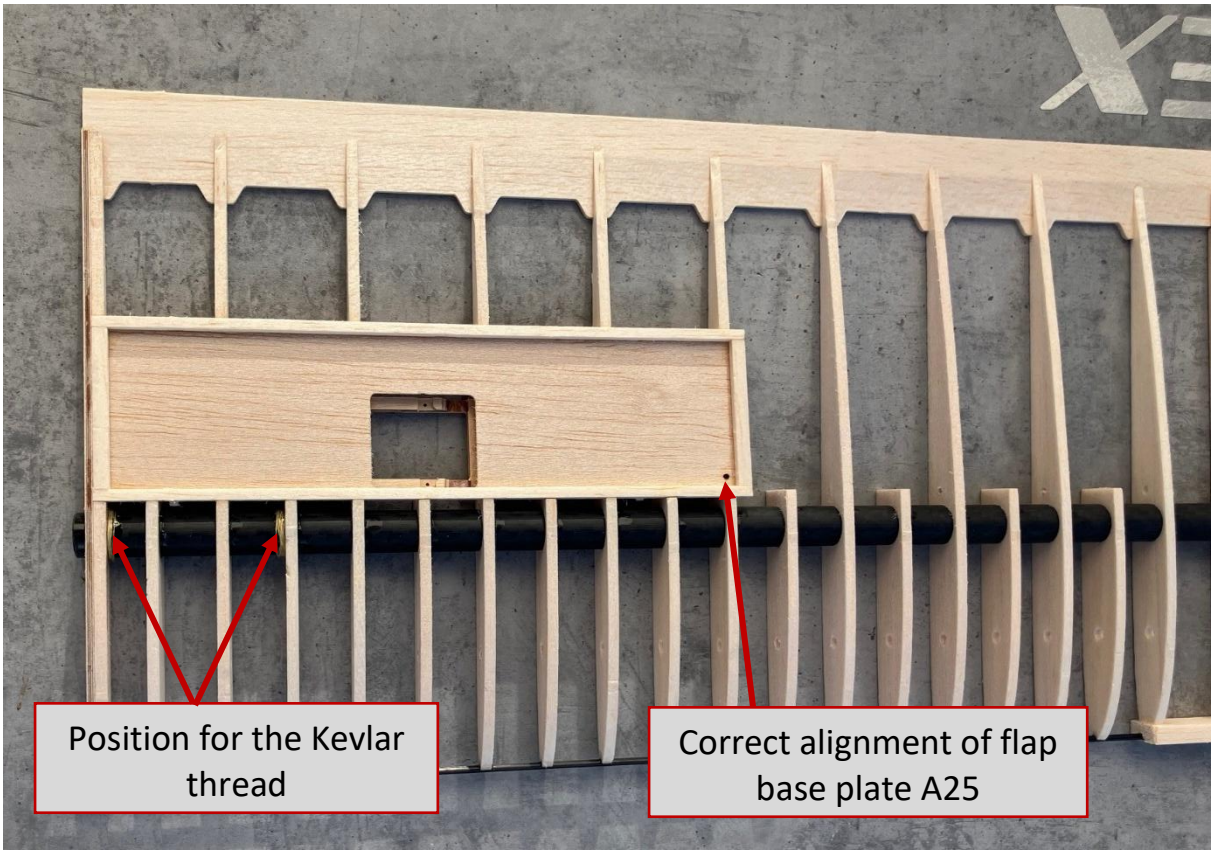
In the case of the previous wing sections, the threaded ribs are aligned with the help of the slipway and the combs and the whole ribs are glued to the spar. When threading the nose strip, pay attention to the additional balsa strip A23, in which the nose strip must also be threaded in the middle. After that, the half-ribs and the balsa strip A23 can also be glued to the ribs A1 and A2. In the end, A23 forms the nose strip of the middle piece for the later planking, as shown in the following **Picture 17.**



Picture 17

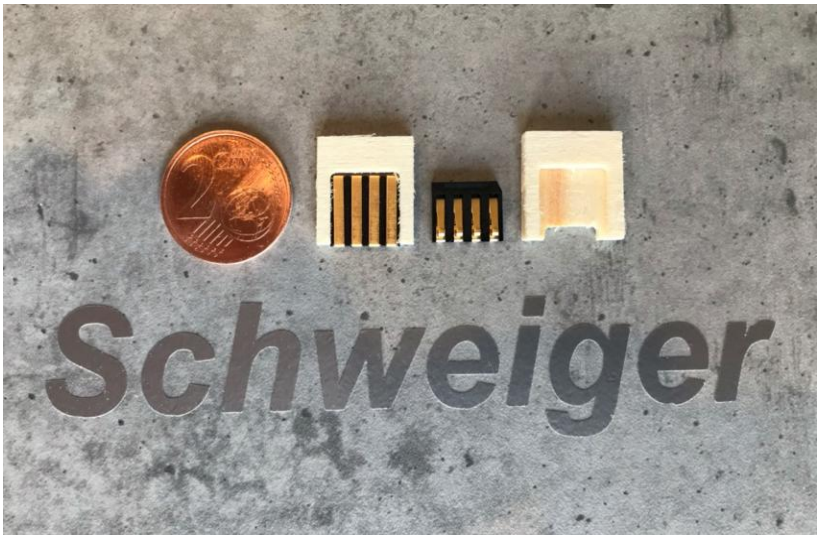
Note: If a strong force is applied to the wing plug during take-off, it can happen that the spar bursts open at the point of the wing joiner. To achieve this, Kevlar reinforcement is still easy to insert in the following construction step. For this purpose, the enclosed Kevlar thread is used. The wing part A is taken from the construction board, behind the rib A20 and in front of the rib A17 we wrap the spar tightly eight times with the Kevlar thread. To fix it, the thread is then soaked with low-viscosity superglue, the exact position can also be seen in **Picture 18.**

The surface piece can be placed back in the slipway, as the next step is to assemble the flap pocket. We start with the base plate of the A25 flap, which is glued into the recess of the top of the rib A10-A20 provided for this purpose. A25 has a hole in one corner for orientation (cf. **Picture 18**), which is positioned so that it points towards the nose bar and the center of the face. With this orientation, the recess for the flap servo is in the right position.
Then the balsa strips A26 and A27 are glued to the base plate of the flap, as they form the border of the brake flap. With the finished flap pockets, the wing part can be removed from the construction board, the support feet on the underside of the ribs can be separated and the trailing edge can be glued on.



Picture 18

The next step is dedicated to wing planking. Before this can take place, it must be decided how the brake flap servos should be wired.



We use a 4-pin spring contact for the power connection from the wing to the fuselage, as can be seen in **Picture 19**. This is also available from us as an accessory. As you can see in the picture, this accessory also includes milled plywood parts, which take the spring plug precisely into the sash mount.

Picture 19

This requires experience in soldering. Once the servo cables have been pulled into the wing and connected to the fuselage, the upper and lower wing planking is adjusted and glued. The upper planking is to be sharpened to the trailing edge.

For the brake flaps, the balsa parts K1-K5 are cut out and placed on the laid-out blueprint, protected with foil. The components are fixed with needles and glued. In the next step, the brake flaps can be fitted into the flap pockets. The brake flaps should have about 0.5mm of air all around. The flaps are correctly positioned when the holes for the magnets point to the end bar and the wider bar K5 to the center of the surface, as can also be seen in **Picture 20**.

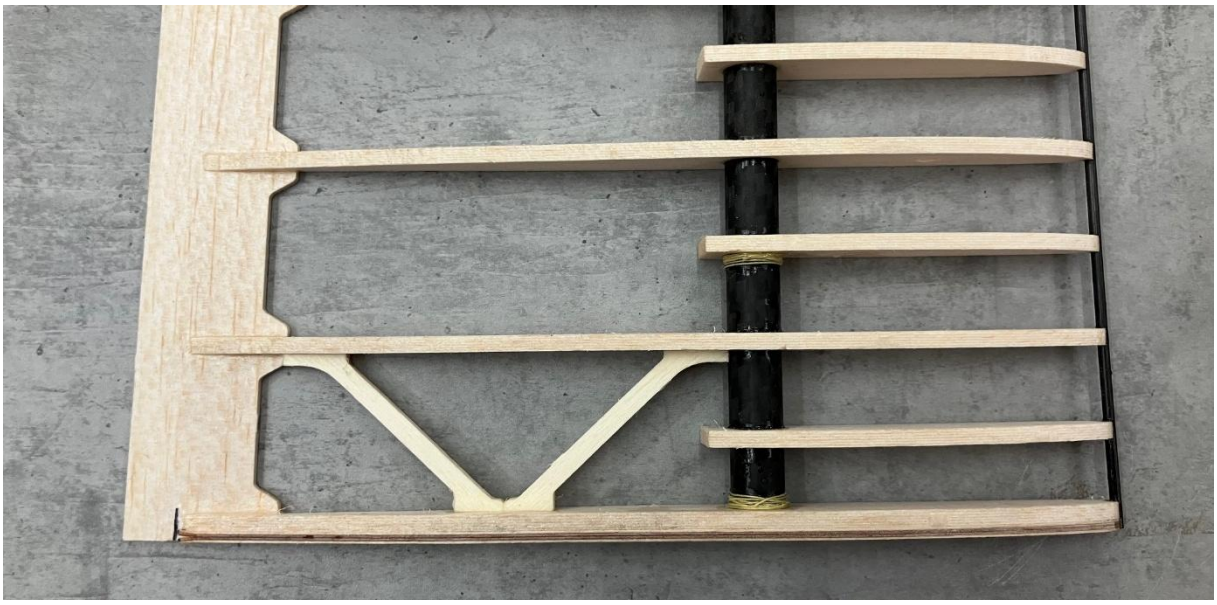
Picture 20

The 4mm magnets are glued into the flap on the same pole, so that they are flushed with the underside of the flap. It is important to make sure that the flaps are not swapped again in the following steps. The flaps are then inserted into the pockets, and the counterparts of the magnets are placed on the underside of the base plate. In this way, the magnets align

automatically and can be glued. The attraction of the magnets is chosen so that they are secured during flight but can still be easily opened by the brake flap servo.
In the following, the upper side of the wing profile is slightly sanded over, while the flaps are still in their pockets. This allows the brake flaps to adapt exactly to the wing profile. It is important to note that the wing profile is not changed when sanding over slightly. Now the CFK tubes, which are still slightly protruding, can also be cut flush at the root ribs of the individual wing parts.

Joiners:
The GFK wing joiners for the individual wing parts are carefully fitted into the CFK spars of the wings. To do this, the edges of the joiners are first slightly rounded off with a flat file. The joiner is carefully adjusted with an even removal of material on the top and bottom until it sits tightly in the wing spars. Subsequently, only the joiners of the wing parts A-B with the balsa parts A31 will be widened on both sides. They can then be ground round until they fit perfectly into the wing spars.
Now, with the help of the finished joiners, the surface parts A-B can be adapted to each other. To prevent the wing sections from twisting during flight, it is important to glue the 2.5mm CFK alignment pins into the center wing section A, not into wing section B. For this purpose, the holes in the end rib of wing section A must be slightly reworked so that the alignment pins run exactly parallel to the tubular spar. The alignment pins should be slightly pointed and protrude about 8 mm from the end rib. When the wing connector is inserted fully into wing section B, the two wing sections A and B must be joined flush with each other.

Like wing part A, the CFK tube of wing part B must also be protected against possible bursting with the enclosed Kevlar thread. Thus, behind the root rib B2 and in front of the half-rib B5, the wing spar is tightly wrapped with the thread and soaked with low-viscosity superglue.



Picture 21

We continue with the two A30 stiffeners, which are glued between the root rib B2 and rib B4. The exact position can be seen in the previous **Picture 21.**
Thus, the two surface parts B-C can now be joined together. For this purpose, the GRP joiner is inserted into the spar and then glued together with the surfaces of the root ribs.

Installation of the brake flap servos:
The KST X06H is intended for this purpose. The long servo arm is extended by the servo arm extension (1mm GFK) from the accessory package by screwing it onto the servo arm. We have also provided a video showing how it works: **https://youtu.be/d9o5HwRrMTI**

The screwed-on servo arm extension must then be cut out in the flap base plate. The servo used points with the servo arm screw connection to the center of the wing and to the nose bar. The servo travel is to be chosen so that the brake flap can be opened perpendicular to the wing and closed completely, as shown in the following **Picture 22.**

Picture 22

Final Steps:

The completed wing part A can now be screwed onto the fuselage, and the top of the fuselage can be closed with the balsa part R15. To do this, part R15 must be fitted between the rear end of the canopy and the wing.

To glue the plywood parts of the wing bolt mounts R20 inside the fuselage, wing part A is removed again. The R20 parts are now in their correct positions and can be glued. Gluing the wing bolt mounts is important because this connection additionally reinforces the fuselage.

Before covering the model with film, all parts are screwed together and their function is checked. A final check of the exact angles is also important, as adjustments can still be made before covering. Once all angles are correct, the model is finely sanded and carefully cleaned of dust, as shown in **Picture 23.**

Picture 23

Covering the model:
When covering the components, it is particularly important to stretch the foil evenly on both sides of the model. It is also important to ensure that both sides of a component are exposed to an even pull. If this is not the case, the component will twist in on itself and thus significantly negatively affect the flight characteristics of the model.
We recommend the ORACOVER films for covering the APEX. If the model is covered with an ORACOVER light film, this results in a weight saving of approx. 30g. However, this film is much more sensitive than the standard film due to its lower weight.

When the model is finished, glue the GRP rudder horns into the grooves provided. The longer rudder horn is intended for the elevator, the shorter one for the rudder. The linkages are to be attached to the outer holes of the rudder horns, as this allows an optimal rudder deflection to be achieved. The high launch hook can now also be screwed in and the remaining RC components installed.

Tip: Picture 24 shows one way in which the rudder linkage can be secured, but still removed for transport. The silicone drops (usually used for earring studs) are easy to attach and secure the frame from slipping out.

Picture 24

RC Components:

We recommend the following RC components for operating the APEX F5L:

- Elevator and rudder: KST X06-V6 servo. Alternatively, servos of similar size, such as the Chaservo DS06, can be used.
- Airbrakes in the wing: Servo frames for the KST X06H are included in the kit.
- Motor: Dualsky XM2527EG-23, 1600 kV. Manufacturer's recommended propeller, up to 8x5.
- Spinner: Dualsky Z-Spinner 30/3.17 mm.
- ESC: 30A.
- Propeller: Dualsky 8x5.5.
- Battery: TATTU LiPo battery, R-LINE, 3S/550 mAh.

This configuration is particularly quiet and the right choice for everyday pilots.

For F5L competition use, we recommend a more powerful setup.

Caution: The following combination of drive components operates at the limits of the electronic components.

As we do not yet have long-term experience with this combination, it should be selected with care and at your own risk.

- Motor: Dualsky XM2527EG-16, 2300 kV. Manufacturer's recommended propeller size up to 7x4.
  We are currently using the Dualsky 8.5x6 propeller for typical F5L launches.
  With this configuration, launch heights of up to 115 m can be achieved in calm conditions (and without thermals).

- Spinner: Dualsky Z-Spinner 30/3.17 mm.
- ESC: 30–40A.
- Battery: TATTU LiPo battery, R-LINE, 3S/550 mAh.

Both drive sets are available upon request from Holzmodellbau-Schweiger.

Basic Settings Before the First Flight:

- Center of gravity: For the first flight, a CG of approximately 68 mm (measured from the wing's leading edge) should be selected. During subsequent flights, you may carefully move it back to 71 mm.
- Control throws: Elevator ±8 mm, rudder 30 mm left/right, airbrakes maximum deflection 90 degrees (mix in a small amount of up elevator when deploying the airbrakes).
- During full-throttle climb, a slight down-elevator mix may be necessary depending on the motor setup.

Note: For the first flights, gentle hand launches are recommended to determine the correct control settings.

The building instructions provide a suggested method for assembling the model. If you have any suggestions or ideas for improvement, we would be happy to receive your feedback.

Please do not forget to apply the APEX decals after completing the covering of the model. They are an essential factor for optimal flight performance ;-)

We wish you especially great enjoyment with your finished APEX and always happy landings!

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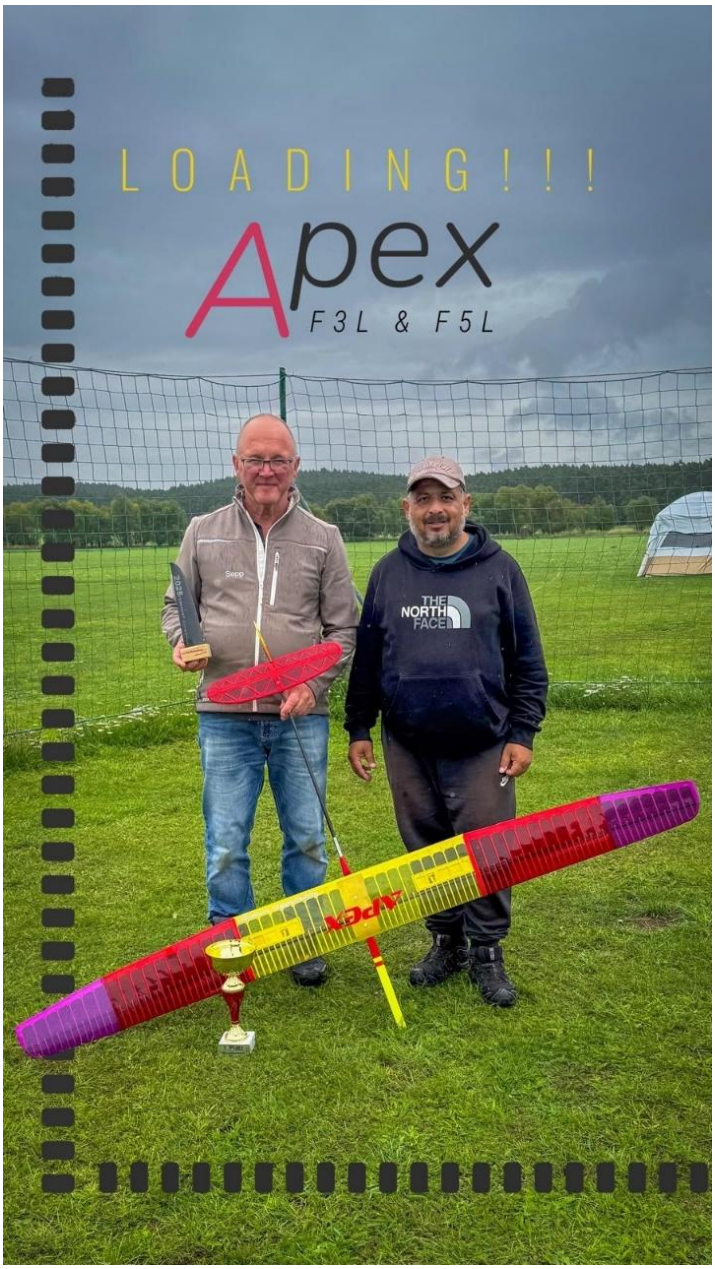

The last picture shows the APEX designer Eser Kismir and Josef Schweiger from Holzmodellbau Schweiger.