



building instructions

Thank you for purchasing the Impala Massimo and congratulations!
You have chosen a quality product "Made in Germany" from CNC Hager eliminated. Please read these instructions carefully before starting construction and go when building step by step.

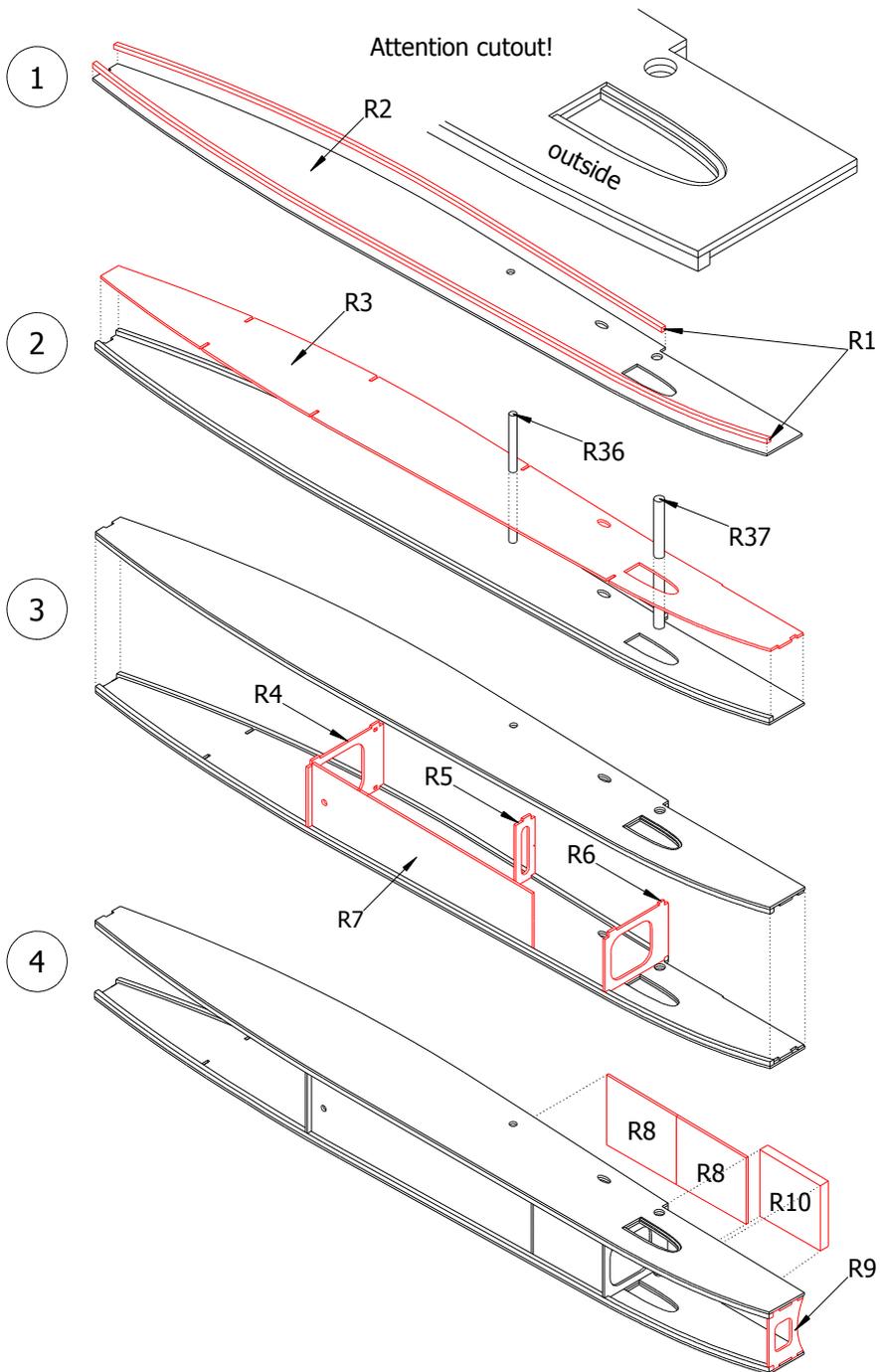
General information about the model:

The IMPALA MASSIMO is a high-speed delta in classic wood construction in conjunction with Carbon fiber. It impresses with its fast-paced appearance, CNC-machined parts and a very large one Speed ??range. Impala can be flown both slowly and quickly. Simple and safe handling is given in every flight situation. The wing is in ribbed Designed and equipped with robust CFRP spars. Frames, sides, ribs etc. are dangled together and thus considerably facilitate the construction of the model. The test models were covered with Oracover ironing foil. The instructions in this given rudder deflections represent a proven basic attitude and should also be permanent be maintained because exaggerated large rudder movements have a negative impact on flight behavior can affect.

Recommended RC accessories:

Battery: from 3S up to max. 4S LiPo
Engine: HET650-58-1970 or similar, but maximum drive power 850W
Impeller: Wemotec Midi Fan PRO or EVO
Servo: Graupner DES 476 BB Digital with mounting frame no. FR11D
Nozzle: Wemotec Midi Fan length 150mm

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Parts and materials are to be performed at your own discretion and risk, here may be for
Consequential damage no liability accepted! For consequential damage caused by improper changes
on parts and materials or in flight operations, in particular due to excessive air traffic loads,
our models may arise, neither warranty nor liability can be assumed by us, as we take the care
the construction and proper operation of the model. The in this
Drawing accessories, RC components and the drive are merely recommendations. Technical
Specifications, in particular take-off weights, may vary depending on the construction and are not binding.
These instructions are part of the product. If you pass the product on to third parties you give as well
continue this construction manual.



fuselage

1

! When building the fuselage side parts always make sure that right and left halves arise.

! The offset cutout points outwards, this is used for recording the air scoop.

- The torsion straps R1 (Balsaleiste 4x4mm) are flush with the outer edge glue the inside of side panel R2 (balsa 2.0mm).

2

- If necessary, adjust the hull doubler R3 (lightweight plywood 2.0 mm) and Apply liquid superglue to the side panel R2, align and glue.

(Use the CFRP rods R36 and R37 or the drill bit ? 6.0 / 8.0mm.)

- join the side panels with the help of the CFRP rods and Smooth outer contour slightly.

3

- A side part with the frames R4, R5, R6 (plywood 2.0mm) and the floor board R7 (light plywood 2.0mm) stuck together.

! By lightly grinding the pins of the frames that is

Mating easier and the hull Doppler R3 not damaged.

- Align on level surface and put on the second side part.

The floorboard R7 also serves as an auxiliary angle to the frames align.

- Glue side parts, frames and floor parts together without distortion.

4

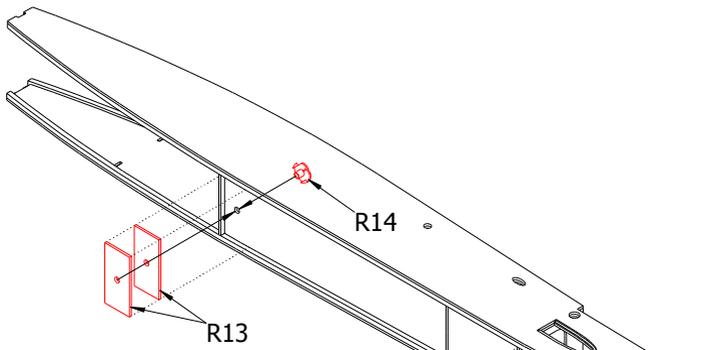
- Assemble lid from both R8 (balsa 2.0mm) and with the Stick the hull center-flat on a level surface.

- Insert and glue rear frame R9.

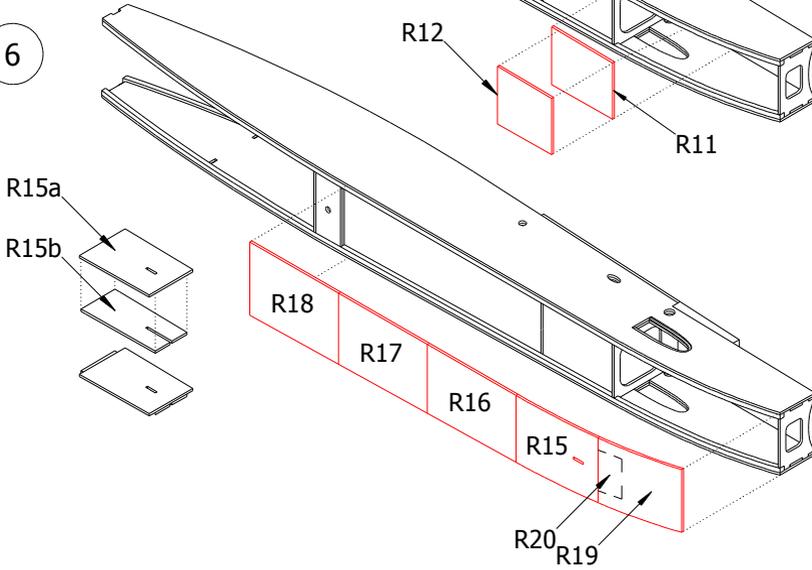
- Possibly. Sand the excess edge of cover R8 flush with frame R6.

- Stick filler block R10 (Balsa 8.0mm) centered centered.

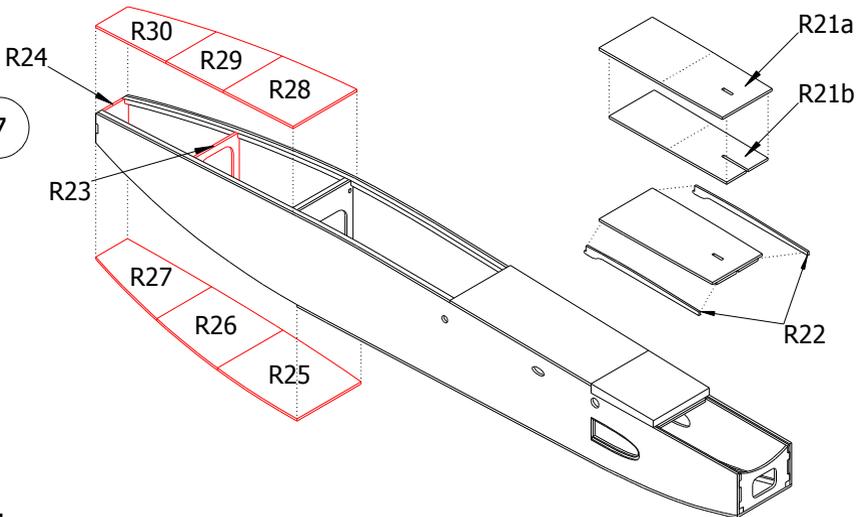
5



6



7



5

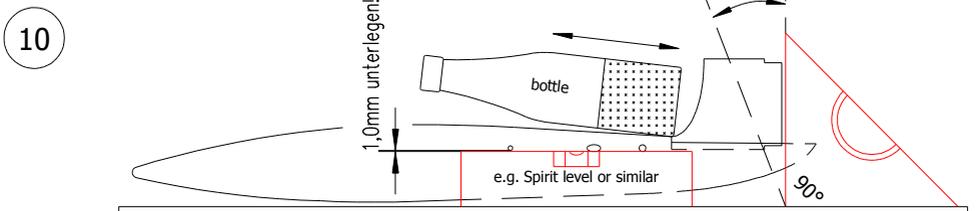
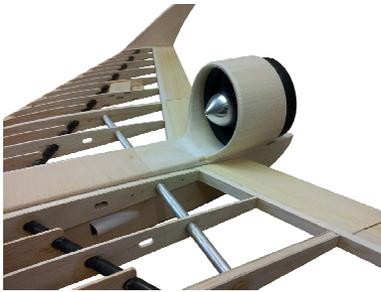
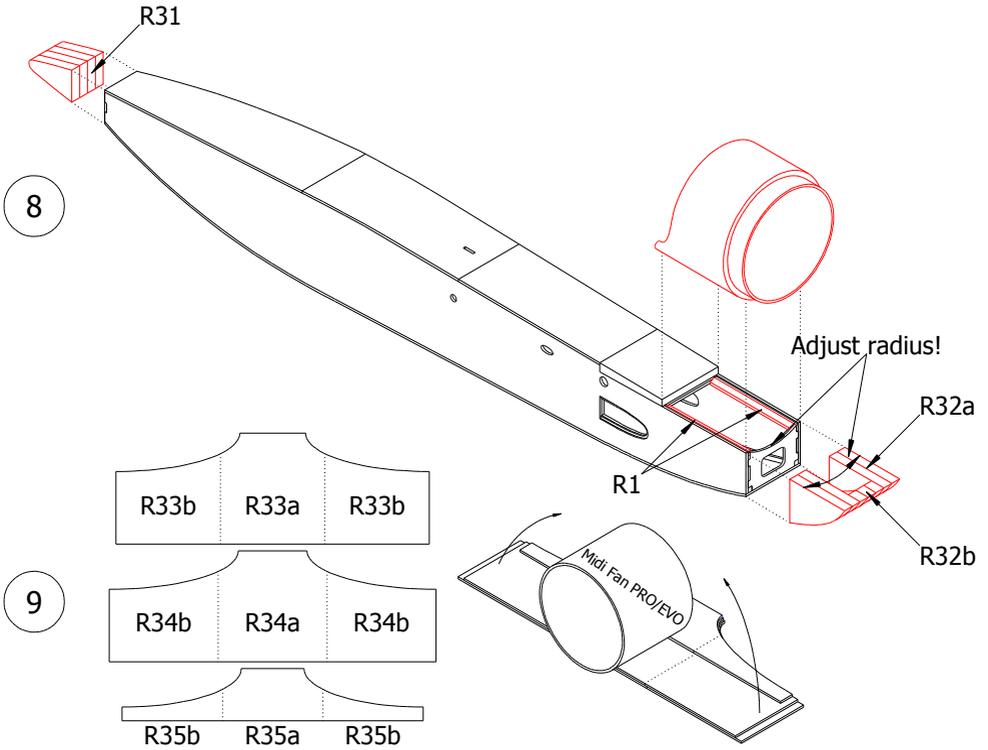
- Reinforcements R11 and R12 (balsa 2.0mm) under filler block R10 at the back stick together flush. (These can also be pasted later.)
- Glue both reinforcements R13 (lightweight plywood 2.0mm) together and stick under the floorboard R7.
- The R14 lock nut for the towing hook from the inside with the help of a Screw (M4) and a large bearing surface - so that the screw is not sink in - press into the floorboard R7 and glue well.

6

- Glue the trunk lid made of R15a and R15b (balsa 2.0mm) together.
 - Insert cover R15 against frame R6, then floor R16 glue in the middle. Be careful not to glue the lid R15!
 - Glue in further floors R17 and R18 without distortion.
 - Glue in floor R19 with 2 pieces of paper between R15 and R19.
- ! The paper corresponds approximately to the film thickness to a clamping of the lid to prevent after the stringing.
- ! If the lid is too stiff to fit the hull contour,
is moistened 15b and carefully pre-bent or adjusted.
- Stick reinforcement R20 (plywood 0,6mm) under R19.

7

- Stick the battery cover of all R21a and R21b (balsa 2.0mm) together.
- Install side reinforcements R22 (plywood 2.0mm) straight.
- Insert frame R23 and R24, whereby only R24 is glued, in order to avoid to make any corrections in case of delay more easily.
- Lay the hull on its side and the height from the construction board to the bulkhead Measure R24.
- Turn the fuselage to the other side and repeat the measurement.
- Correct the hull if there are any differences.
- The soils R25, R26 and R27 (balsa 2.0mm) taking into account that no distortion or a twist in the hull comes, stick.
- Glue the ribs R23 and R24 together.
- Should the frame R4 yield due to excessive pressure of the side parts, this can be slightly strengthened by a rest R1 (Balsaleiste 4x4mm).
- The remaining covers R28, R29 and R30 (balsa 2.0mm) with the help of from battery cover R21 stick together.



8

- Assemble nose block from all R31 (Balsa 8,0mm) and center glue it centered to the hull.
! Pay attention to the correct nose contour in the side view!
- Assemble the tail block from all R32a and R32b (balsa 8.0 mm) and Stick centrally centered at the end of the hull.
- Adjust the tail block to the radius of frame R9 by grinding.
! Here can serve a bottle or tin can with sandpaper as an aid.
! Do not grind or alter the support of the impeller.
- The hull complete including both lids, previously with two if necessary small drops of instant glue can be fixed (if not from should hold alone), grind.
- The complete outer contour, as well as the fuselage nose and the tail block grind according to all drawn sections in the blueprint.
! The fuselage must be the same in the area between section E and F. Have radius as the inlet lip of the impeller, thus at section F a Homogeneous transition to the impeller arises.

9

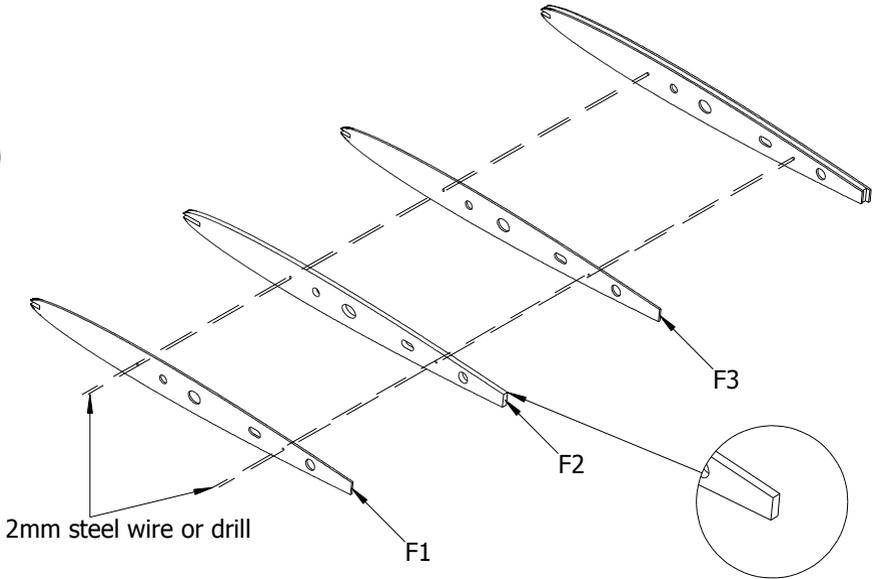
- All wraps R33a + b, R34a + b and R35a + b (balsa 2.0mm) assemble and sand the splices clean on both sides.
- Test the impeller as a test without adhesive with the wrappings R33 and R34 Wrap carefully one after the other and secure with Tesafilm.
! Moisten the wood to make it easier to bend and not break.
- To do this, starting with R33, wind from bottom to top until both ends touch. Depending on the thickness of the wood, the ends must be adjusted.
- R35 is inserted inside to create a smooth transition.
! All wraps must be aligned with each other in front, and evenly flush conclude.
- If everything fits, the process with enough thick superglue to repeat. It can also be used here very thin epoxy resin become. This should not be applied too thick, otherwise the Winding up too short. Therefore use very thin epoxy!
! To achieve additional stability of the impeller, the impeller incl. All Soak the windings at the front and back with thin superglue.
- Grind the inlet lip and the rear of the impeller as planned.

10

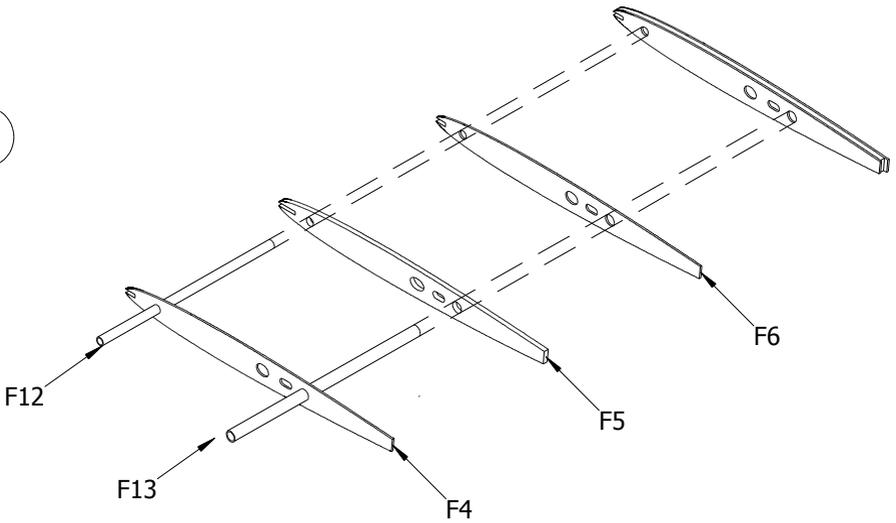
- The finished grinded impeller straight and centered with a lot of thin liquid Glue superglue inside and outside well. (See Figure 10)
! The impeller may rest slightly forward on the hull.
Under no circumstances may he be negatively employed. Better the front part of the Impeller dips something in the hull. (Positive employment up to 1.5 °)
- Stick the torso straps R1 under the impeller as reinforcement. (Section F - G)
- The air inlet area of R10 (section E - F) with a bottle and sandpaper grind in until a homogeneous transition occurs. (Picture 10 and section A - G)
! The diameter of the bottle must match the inside diameter of the impeller correspond.
- The CFRP rods R36 and R37 are glued in only after covering.
- Air intakes R38 may be used before or after Covering to be glued.

Attention: right and left area!

11



12



Attention: right and left area!

Construction of wings

11

- Read the next steps very carefully and completely they contain very important details about the correct construction.
! In the following steps always pay attention to right and left Produce components!
! Both surface halves are built in parallel around each other to be able to compare.
! Pay particular attention to the rear slope of the ribs! (See magnifying glass picture 11)
- The root rib (consisting of F1, F2 and F3 plywood 1,5mm and balsa 4.0mm) using 2 drills or steel wires glue together (? 2.0 mm) as fixation.

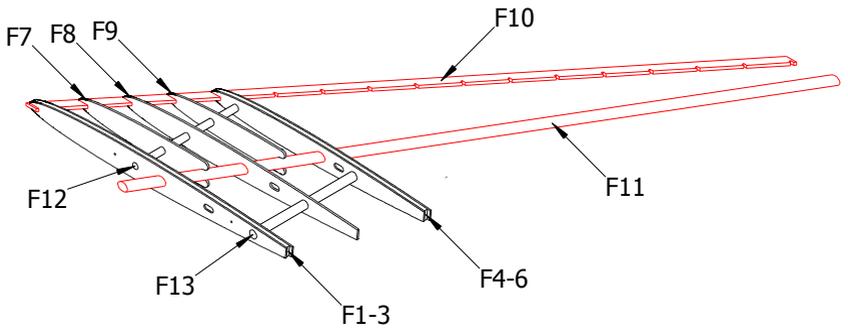
Method:

- Thread a plywood rib F1 with two steel wires and F2 put off. F2 lies flat on the construction board.
Repeat the procedure with F3.
- Assemble test F1 - F3 one after the other.
If everything fits, the process can be done with thick superglue be repeated. (Pay attention to the slope of the ribs again here!)
When gluing, make sure that no glue gets into the holes.
Also, no adhesive may be applied to the area where later the nose and end bar is plugged, as this is the fit accuracy negative would affect.
- Note: The mounting holes of F1 - F3 are necessary for the correct offset of the "receiving holes" for the aluminum tube is created.
This is the only way to get the right angle of the root rib to the hull later.

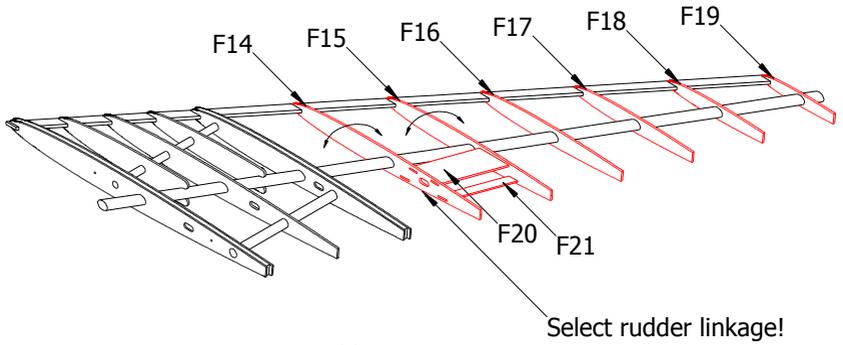
12

- ! Pay attention to right and left components again !!
- Stick the carrier ribs F4, F5 and F6 together.
Proceed in the same way as for the root ribs F1 - F3.
Here can ever use an aluminum tube F12 and F13 as mounting aid.
- Do not bring any glue to the aluminum tube and the connection.

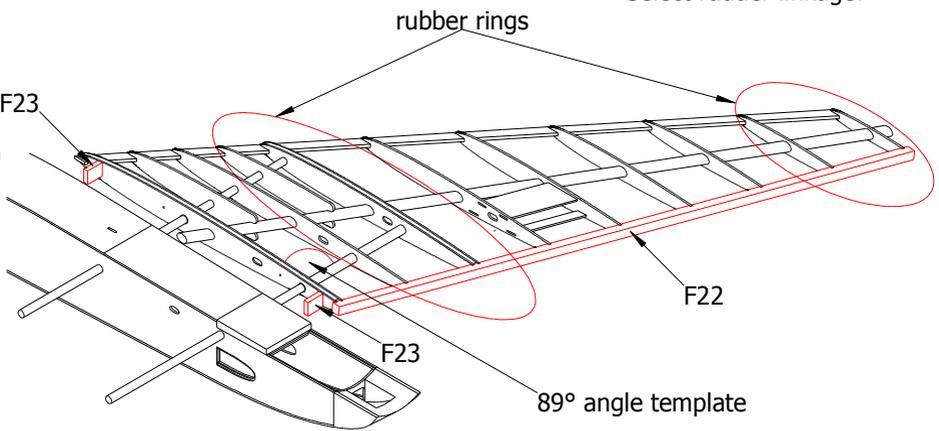
13



14



15



13

- ! Sand aluminum pipes F12 and F13 with sandpaper and degrease.
- The following steps are initially only plugged!
- Carefully put the inner surface together.
Consisting of the ribs F1 - F9, the leading edge F10, the CFK main spar F11, as well as the aluminum tubes F12 (6,0mm) and F13 (8,0mm).
- ! Check the back slope of the ribs again and again!

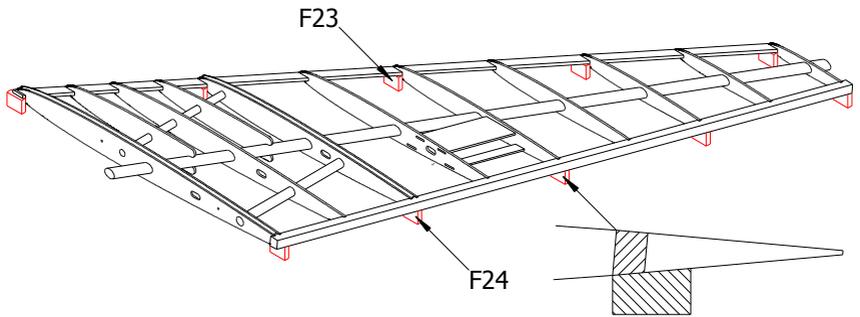
14

- Expand the wing with ribs F14 - F19, with ribs F14 and F15 with the servo board F20 (plywood 2.0mm) and the two frames F21 (Plywood 1.5mm) which were previously put together expand.
- ! Here, by turning the ribs, the articulation of the rudder from above or be selected from below. The rear slope of the ribs F14 and F15 is adjusted accordingly.
- ! It should be applied here a little more glue later, as the two Rip F14 and F15 only halfway into the tap of F22.

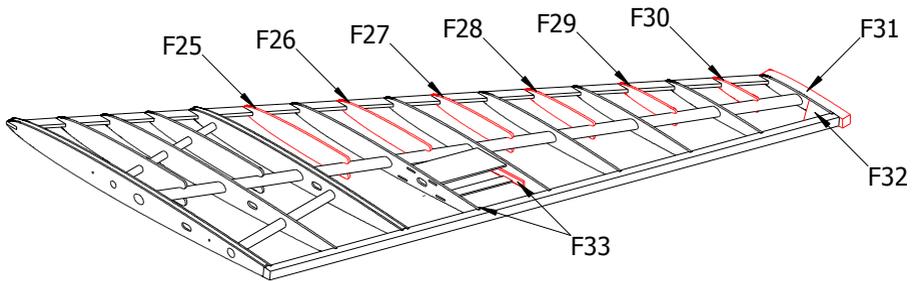
15

- put the bar F22 (balsa 8.0mm) evenly on the ribs,
Pay attention to the correct inclination.
As an aid two rubber rings can be used.
- If everything is put together correctly, again with the plan and
Check or compare the 89 ° angle template.
- Now the plan seat of the root rib with the help of two equal
Parts such as e.g. Check F23 by sliding on the fuselage, correct if necessary.
- ! Compare both surface halves.

16



17



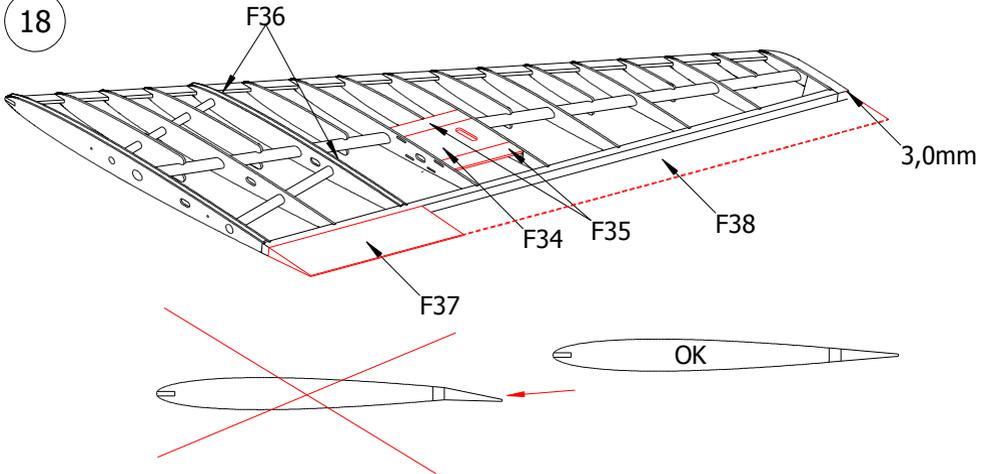
16

- Lay the wing on a level and even surface.
Place the auxiliary blocks F23 under the leading edge F10 at the front, F24 inside flush with the Balsaleiste F22.
- If everything aligned without distortion and to the appropriate
If something is complaining, the wing can be completely thin
Glued superglue.
- Always apply superglue on both sides.
! The aluminum tubes in the area of the ribs additionally on both sides with eagle owl Do not stick to final strength, as with superglue no 100% strength can be reached.

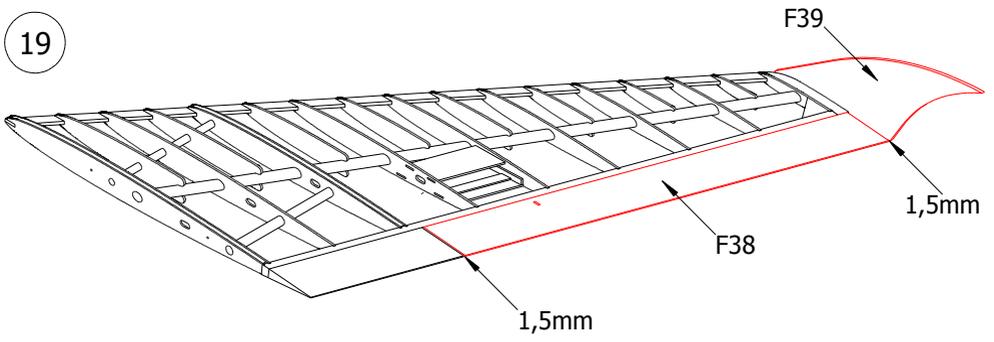
17

- Insert and glue the remaining nose ribs F25 - F30, here pay attention to the rib F26, so that it is used correctly.
- remove the wings from the construction board and glue the remaining parts, that could not be glued so far.
- Glue the edge bow F31 (balsa 10.0mm) flush with the rib F19 at the front.
- Bond surface reinforcement F32 (2x Balsa 8.0mm).
- Fit semi-trailer F33 (Balsa 2.0mm) according to plan and Fig. 17 and glue.

18



19



20



18

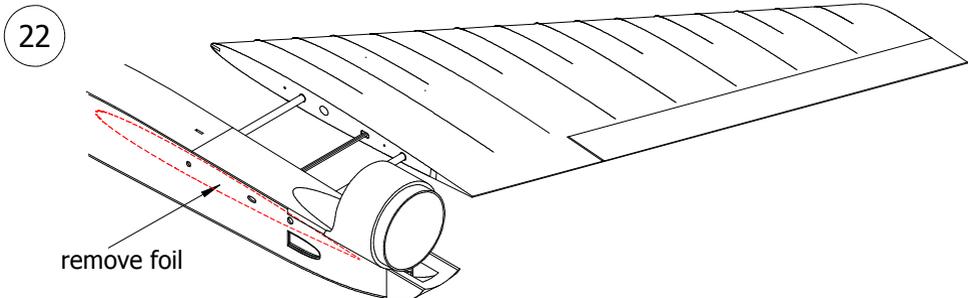
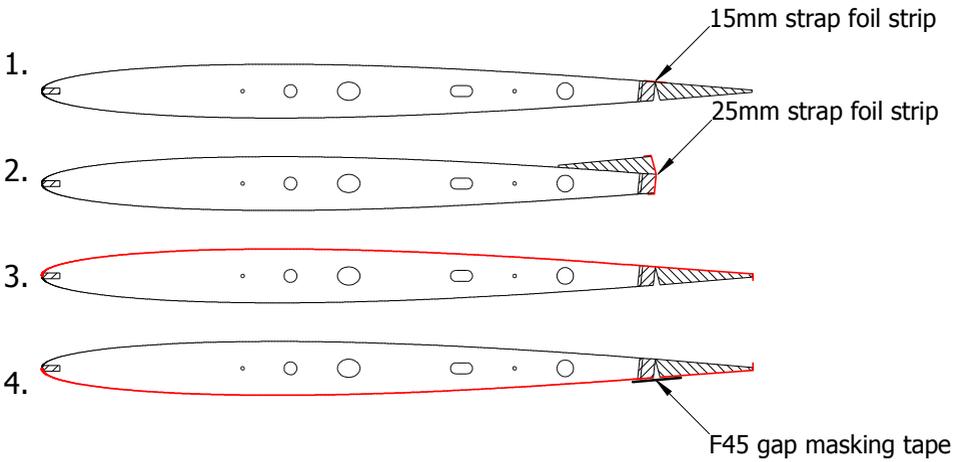
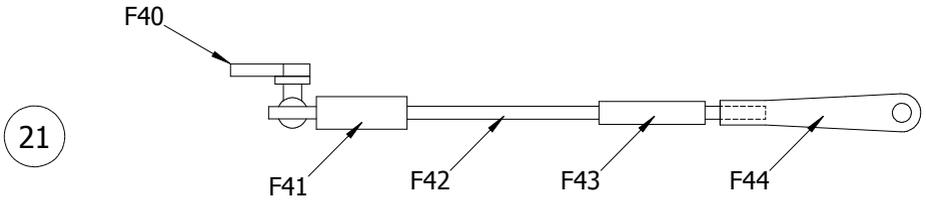
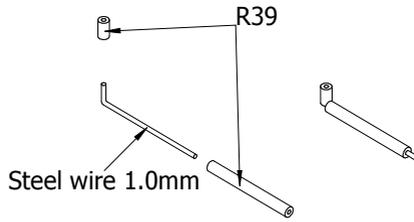
- The servo cover F34 and the planking F35 (Balsa 2,0mm) fit in and stick together according to plan, whereby for the time being only F35 is glued.
- Glue in the pipe connections F36 (Balsa 2.0mm).
- Adjust the end bar F37 on the wing, then slightly with superglue points and compare both surfaces again, before the end strips are firmly glued with thin superglue.
Here is the aileron F38 with about 3.0mm offset to the wheel arch be taken to help.
- ! The end bar must be symmetrical to the profile course (see Figure 18).
Under no circumstances, the end bar should be negative, because the model otherwise would pull down hard. Positive employment would be in this case reasonable, as it would resemble a S-bow and would give rise to buoyancy.
- ! Push both surfaces together (for example with drills 6,0mm and 8,0mm) and compare with each other.
- The wings in profile profile including the leading edge, end bar and edge bow grind over, round off the leading edge and the root or
Sand the sandwich ribs without removing the ribs too much.

19

- The tail units F39 (balsa 3.0mm) with two very small drops
Fix the superglue flush with the edge sheet F31 all around.
- Fit the aileron F38 so that it is evenly spaced
of about 1.5mm on both sides.

20

- Sand the wings including the ailerons F38 and the tail units F39 cleanly.
To do this, adjust the tail units F39 according to Fig. 20 at the edge bend F31 and round off at the front / back.
- The tail units can be removed after sanding.



Completion of bodyshell / covering

21

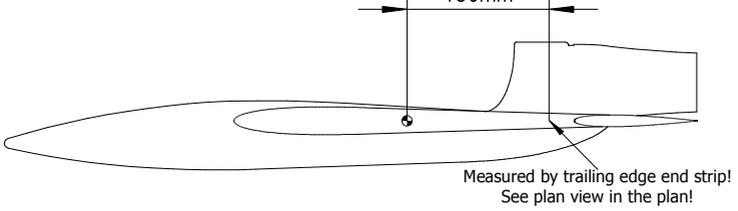
- Mount the model as a test. Make any necessary corrections.
- The locking hooks of the two covers of R39 and the steel wire 1.0mm (See Figure 21 or Plan).
- Install servos after the servo levers have been mounted and adjusted in the middle. (Recommended Servo Graupner DES 476 BB with mounting frame no. FR11D)
- ! Use as short servo levers as possible!
- Pull in the servo extension cable (approx. 50cm, not included in the kit).
- Ailerons with an approximately 15-20mm wide strip of ironing foil on the top and attach a 25mm wide strip to the bottom of the wing.
- The servo links according to the blueprint (section B) from parts F41 - F44 produce and connect as a test with the ailerons. (Adjustments)
- Adjust the servo cover F34 to the servo or the linkage.
- After the servo installation is completed and tested with the Stringing started.
- We recommend to adjust the ailerons according to the ironing instructions (Fig. 21) it represents the safest and cleanest method. (All test models were covered with Oracover.)

22

- Remove the foil on the fuselage in the area of the root rib, so that a splice for the subsequent assembly is created (Slide on wings and mark the rib contour with a pencil).
- ! As an additional attachment, the mounting holes (2.0mm) of the Area root transferred to the fuselage. Thus, the wings in the gluing of additional screwed inside and thus prevent unwanted loosening during curing of the adhesive.
- ! We strongly advise against the wings only on the fuselage screw together without sticking, as the wings otherwise at Could dismantle top speed!
- Bond CFK rods R36 and R37 in the center of the fuselage.
- Adequate adhesive (Uhu Endfest) in the aluminum tubes and on the Give root area.
- ! Do not use too much glue, otherwise it will work could spill out. (Can be removed with alcohol.)
- Thread the cable into the fuselage and slide both wings evenly.
- ! Make sure that no different setting angle by any Game arises in the pipes.
- Mount the motor and controller at your own discretion.
- ! Be careful not to hinder the cooling air flowing through.
- Fasten control surfaces F39 with super glue etc. well.
- Screw in and attach the tow hook R40.
- Attach the gap masking tape F45 for ailerons.
- Completion of the model at its discretion.

center of gravity

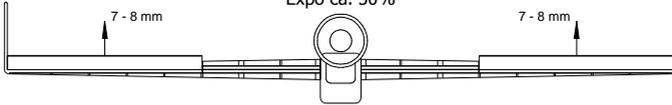
150mm



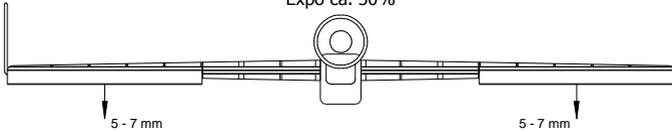
23

Rudder adjustment: (view from behind)

Elevator (up)
Expo ca. 50%



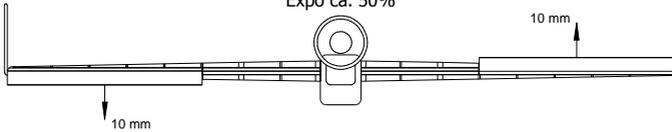
Elevator (down)
Expo ca. 50%



Aileron (to the left)
Expo ca. 50%



Aileron (to the right)
Expo ca. 50%



24

center of gravity

23

1561/5000

The Impala Massimo is a high-speed delta! By his missing

Control center is the emphasis very important and to comply exactly.

The model has a full-symmetrical surface profile without S-stroke, whereby it does not develop any buoyancy without employment.

As a result, the model snaps its nose down, starting at the start or slow flight is the case.

The profile was nevertheless chosen consciously, as an S-beating profile would be negative at high speeds.

S-Strike profiles were tested at high speed

Undercut to have led to twisting of the wing.

Although these profiles have better gliding characteristics than that now used symmetrische profile, but the Impala Massimo was designed mainly for fast gaits.

Since the Impala nose down without its own buoyancy,

Now the drive thrust at the correct angle should counteract this.

Should the model despite correctly adjusted center of gravity in the top speed tend to nose down, this must be changed

Engine crash be compensated.

To do this, slightly change the torque tube in the fall.

The prerequisite for this is that the bearing surfaces are built and installed without distortion and the ailerons are set to neutral.

! This behavior must not only by shifting the focus to be changed behind.

! Too far backward center of gravity can cause stalling and Flat spin lead, which can not be discharged in the worst case.

Rudder adjustment:

24

- Make the row settings as shown in Figure 24.

These are a basic setting for the first flights.

The settings can be changed at your discretion.

! Since the ailerons are designed large, it can be too big adjusted rudder deflections and sudden full rash at high Speeds lead to stalling!

! Generally, a sudden full turn should be at high speed avoided so as not to unnecessarily overload the model.

The Impala Massimo is designed for high speeds, depending on Drive can easily reach over 200km / h, therefore is at abrupt Maneuvers with very high loads expected.

Impala Massimo should be moved as jet-like as possible ...

Final inspection

Please inspect the wings again for distortion and the rudders for proper function check. We recommend that you do not use a torque tube on the first flight, as a wrong mounted thrust pipe could possibly have a negative impact.

Likewise we strongly recommend a flit start.

At the start of the hand, the oars are hardly streamed and a sagging of the model on the first meters without sufficient rudder effect easily leads to the impact of the model.

Great and experienced throwers have already thrown the Impala Massimo successfully, Normally we prefer the flit start.

We recommend our catapult tripping device, which is available from Himmlische Höllein.

This makes the rope start for everyone (even alone) a breeze.

25 - 30m hose rubber ? 7-8,0mm and approx. 50m tow rope should be used here.

The start:

- Batteries (also transmitter battery) charged?
 - Flight battery secured against slipping?
 - Switch on transmitter (throttle stick to "Off").
 - Connect the flight battery.
 - Check the focus again.
 - Raise engine to half throttle and flick model.
 - Slowly give full throttle after flitting and at the same time pull up slightly. Then the model should be even complete straight flight (slightly uphill).
- ! Never give full throttle at the start to prevent it the model by the thrust of the impeller at the same time lower Speed ??with your nose pressed down.
- Trim the model at height so that it flies straight ahead at full throttle.
 - If the center of gravity is set correctly and the wings Ideally, the rudders should be in neutral position at full throttle.
- ! Should this not be the case by adjusting the nozzle one Art engine lash be made.
- ! This should by no means be done by moving the flight battery!
- The specified Ruderausläge can after own Discretion to be adapted to your individual preferences.

The landing:

- ! Make a few test approaches before you land for the first time Feeling for how long Impala Massimo will slip.
- Fly flat with quarter throttle and turn off the engine early, because the model will still slide very far without the engine.
- ! Allow Impala Massimo to land sufficiently in 30cm when landing before you let him sit up. This prevents an uncontrolled again Take off or possibly fling around on the runway.

Have fun building and flying wishes your CNC Hager team.

Tips and more information at:

email: cnc.hager@googlemail.com

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