

Aero20

A 3D printable RC-Trimaran by YACHTPRINT, Chris Angelduro

Version 1.1, 11/2025



The **Aero20** trimaran is the latest development from YACHTPRINT and incorporates all insights and improvements gained from previous boats. It is designed specifically for the “Mini 20” multihull class rules and fully exploits the dimensions allowed within the class.

Thanks to its **compact size**, the Aero 20 is very easy to transport and usually does not need to be disassembled. Yet it offers the option of disassembly, allowing it to be transported even by bicycle if needed. The small size also means reduced material use, shorter printing times, and therefore lower costs.

Despite its compact construction, the Aero 20 delivers **remarkable sailing performance** that one would not expect from a boat of this size. In fresh wind, it sails—just like the larger trimarans—on a single hull while the main hull and the windward outrigger lift completely out of the water.

A completely new level of excitement offers the option to **fully fly on foils**. They can be attached or removed with just a few screws, and the angle of incidence can be adjusted individually. Thanks to the T-rudder, the trimaran remains safe and easy to control even in this dynamic position.

the Aero 20 is designed to use the **original rig of the DF65**, meaning mast and sail. This saves a great deal of time and provides a reference sail that is also approved for competition. However, all parts and a detailed plan are also available for building your own rig in accordance with the Mini 20 class rules.

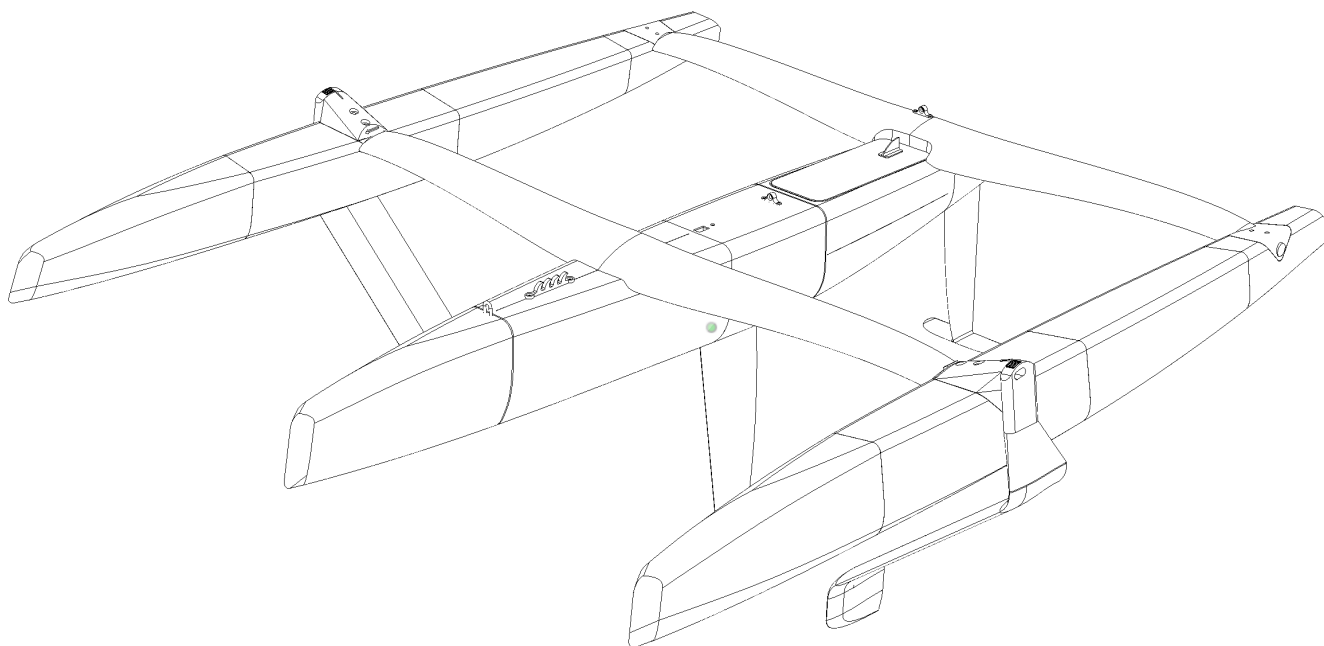
The appendages— **daggerboard, and rudder—are fully printable** and do not require any reinforcement with carbon fiber or epoxy. The same is valid for the hull if printed in ABS/GF.

FEATURES:

- Compact 3D printable RC-trimaran **prepared to use a DF65 rig**
- Complies the **“Mini20”-class rule** for competitive racing
- **Longer AMA (outside) hulls** maximized class legal dimensions, with 5mm safety ;-)
- **Center hull with more volume** by increased width and more pronounced rocker line
- New hulls design support heavier **sail winch setup** and print materials like **ABS/GF**
- **Wave piercing bow design** of all three hulls
- Modified **KEEL BOX** and **new RUDDER TUBE** to avoid water leaking
- **Beams aerodynamic fairing** allows for 3 variants of (cross-) beam setup:
 - Pure 10mm carbon tubes (like at the TRI20 pure)
 - Faired fairing parts around carbon tubes (standard solution for Aero20)
 - Laminated carbon laminate on the fairing parts (like at the MOD20)
- **Fully integrated, demountable foiling setup** by adjusted forward beam position

TECHNICAL DATA:

Length	715 mm center- and ama-hulls
Width	715 mm including foils
Weight	0,8 kg ready to sail w/o battery and DF65 rig A+
Print plate	205 x 205 x 205 (minimum size for x/y/z)
Build time	2 days printing, 2-3 days building, total: 1 week
Material	Designed for ABS/GF but compatible to many other materials



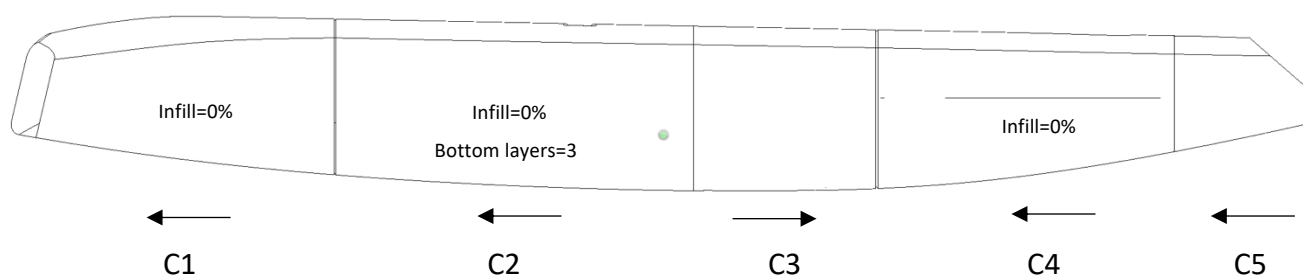
In addition to the printable components, you will need the following parts:

- 2-channel RC transmitter and receiver system, including battery
- Mini servo for the rudder, Sail winch standard size e.g. from Kingmax
- Two 10mm carbon tubes as crossbeams, length forward beam: 680mm, rear beam: 660mm
- Rig of a DF65, preferably A+ or RG65 class legal rig or DIY
- Sheet line (e.g., 0.5mm fishing line) and 1mm rubber line
- 1 ball raced block or 1 ball bearing 4/8/3 stainless
- 3mm stainless rod as rudder axis, shaft collar with 3,1mm hole for rudder arm

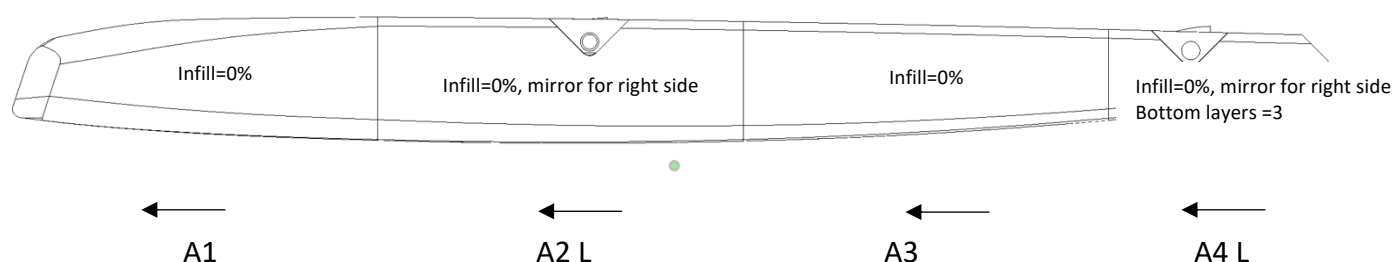
3D PRINTING

- Mirror parts marked with “L” in the slicer along X for the right side corresponding parts
- Most hull segments are solid bodies (except C3, C5) so set infill=0% in the slicer to get hollow parts
- Print those segments with the rear vertical face sitting on the print bead and print “towards the bow”
- Those segments have no top-/bottom layers, so set them = 0, except for C3: set bottom layers=3
- Adjust the slicer to achieve a 0,8-1,0mm wall thickness, e.g. two walls with 0,4mm width
- C3 and C5 are shelled bodies that are hollow by design. Print C3 (the mast/keel section) sitting on its vertical face printing backwards. C5 (stern/rudder section) shall sit on its rear wall while printing.

Center hull

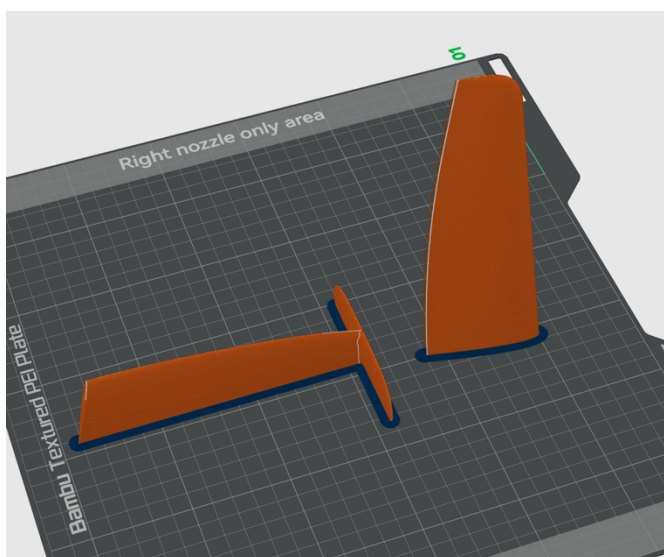


AMA hull



Print direction and settings for the center- and ama-hull parts

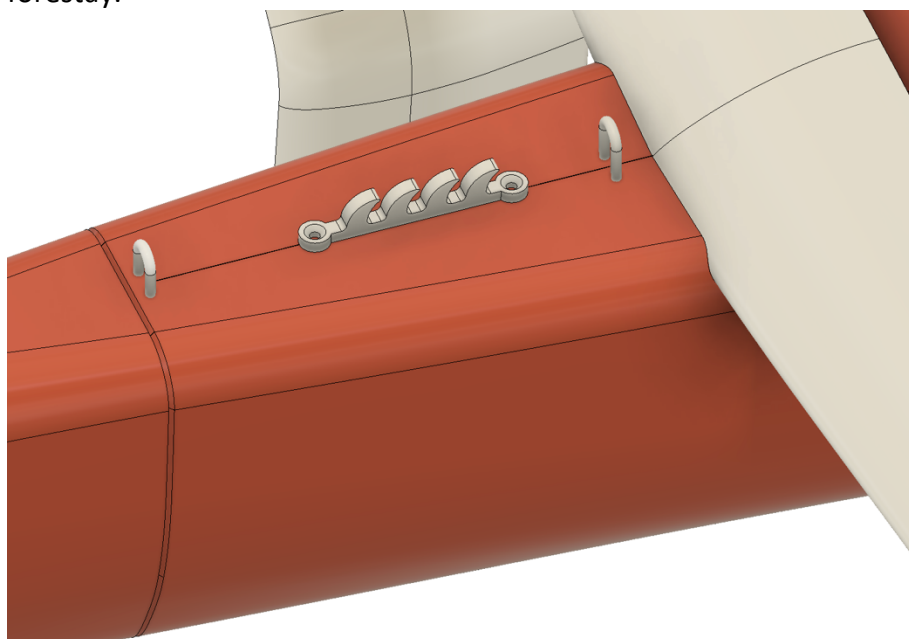
- The beam fairings can be printed sitting on their back wall, you can- but don't need to set infill
- In case the beams fairing do not fit your building plate you can cut them in the middle in the slicer
- All remaining parts shall be strong, so set walls=4 or more and use ABS/GF or another strong material
- The keel fin is printed on its root face with a brim
- The T-Rudder is printed on its trailing edge with a brim. Tip: if you have trouble, let the rudder sink in the printing plate by 1-2mm so that the wall thickness increases a little bit



Printing orientation of the appendages including a brim

ASSEMBLY

Install two strong deck eyes (or eyebolts) at the forward end of section C2 on the center hull to secure the forestay.



The positions for the deck eyes are 2mm – and 90mm from the forward edge of C2.

The pivot line of the jib boom is run through the forward deck eye and is then fixed with a hook on the second rear deck eye.

If the pivot line is fitted with a loop, it can also be hooked onto the shark pins, similar to the DF65.

(see also further below in "SHEETING")

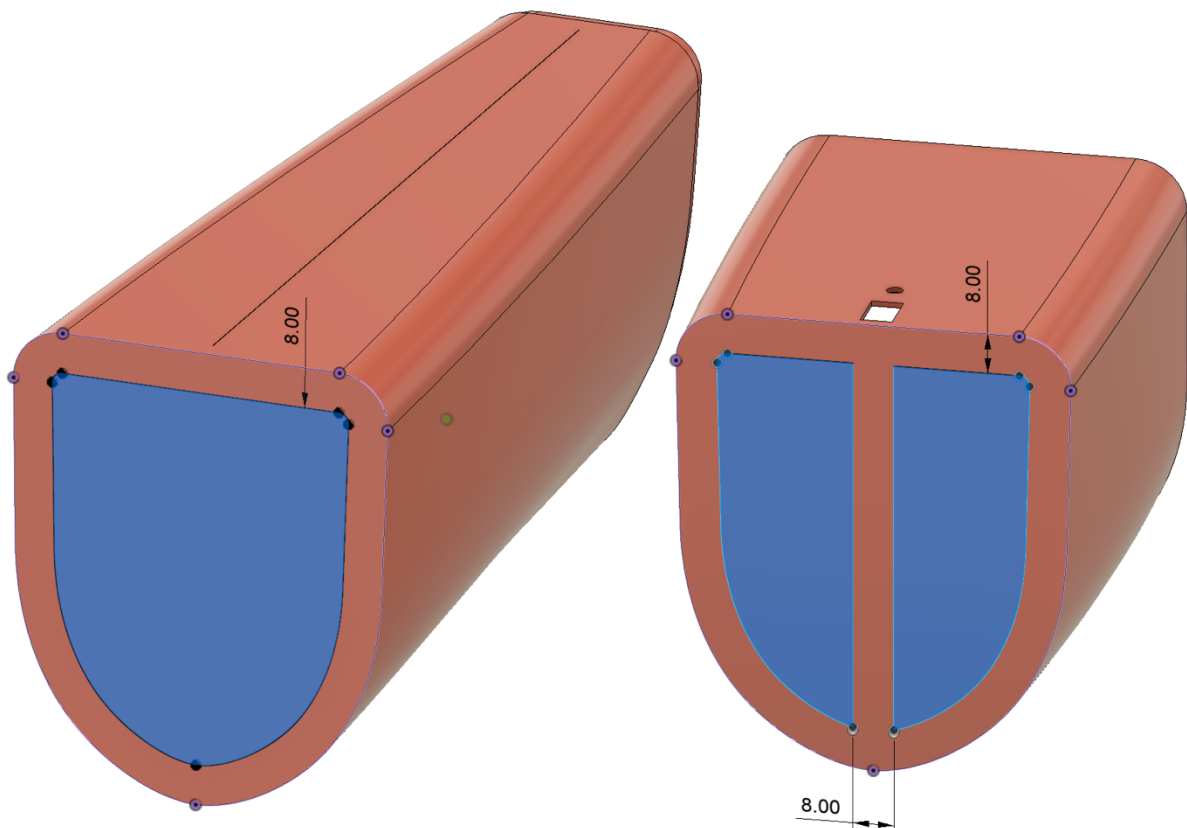
To create deck eyes, bend a wire into a U and trim it to approximately 15mm. Bend both ends 90 degrees in the same direction and insert them into two small holes on the deck, securing with epoxy. The orientation of the ends is important, as they need to apply pressure against the deck when force is applied.



The deck eyes are simple wire bents (example picture from another (!) boat)

Glue the KEEL BOX in C3 (mast/keel section) and the two RUDDER TUBE parts in C5 (stern section) of the center hull. Drill the RUDDER TUBE to 3.1mm and ensure all parts are completely waterproof.

Cut openings in the vertical faces of C3 and C2 using a hot knife, such as a soldering iron with a blade.



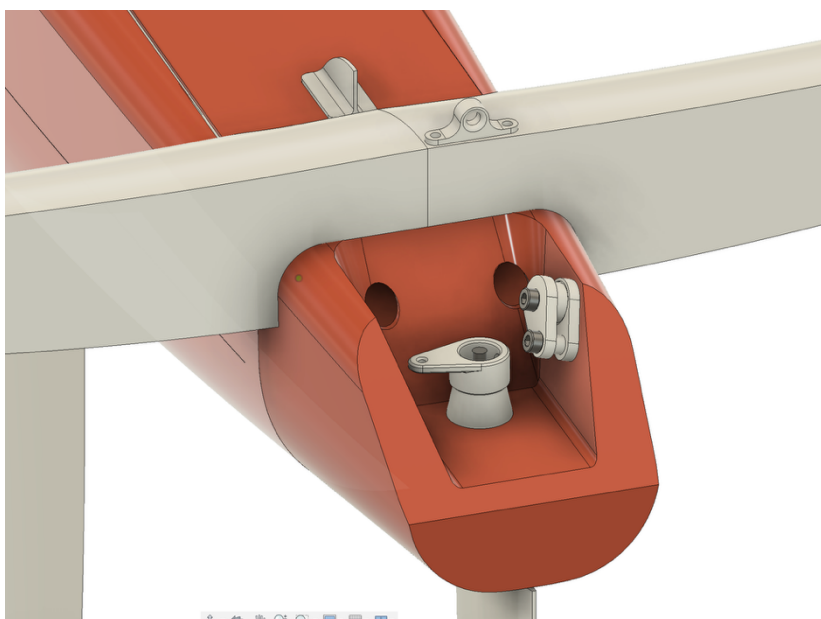
Glue the RC cage into the RC frame, then install a mini rudder servo and standard sail winch. Slide the assembled RC compartment into C4 and glue it onto the horizontal stringers. Cut out the indicated recess for the hatch opening on C4 and glue in the hatch frame.



The RC installation with a standard size winch and a mini sized rudder servo.

The hatch frame is installed as shown. It should have a tight fit with the hull to ensure the same tight fit with the hatch cover.

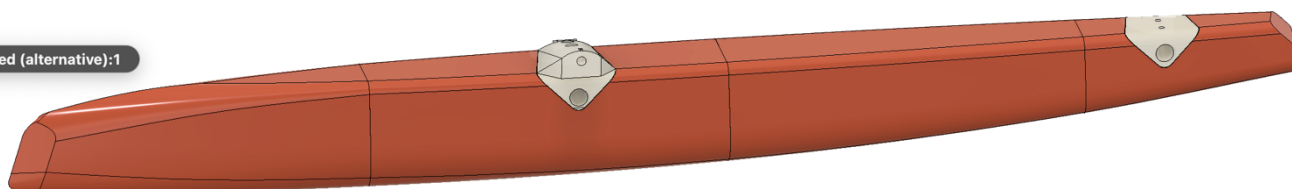
Now, you can glue together all center hull sections. Install the turning block for the sheet as shown below and press in shaft collar with a 3,1mm hole (not shown in picture) in the RUDDER ARM



The rear end of the center hull

The assembly of the ama (outrigger) hulls should be performed in a systematic manner. Join the hull segments using the beam brackets, ensuring that the sides are not confused, as A2 and A4, along with all beam brackets, are not symmetrical. For the right side, mirror any parts indicated with an "L" in the slicer along the X-axis to achieve proper alignment.

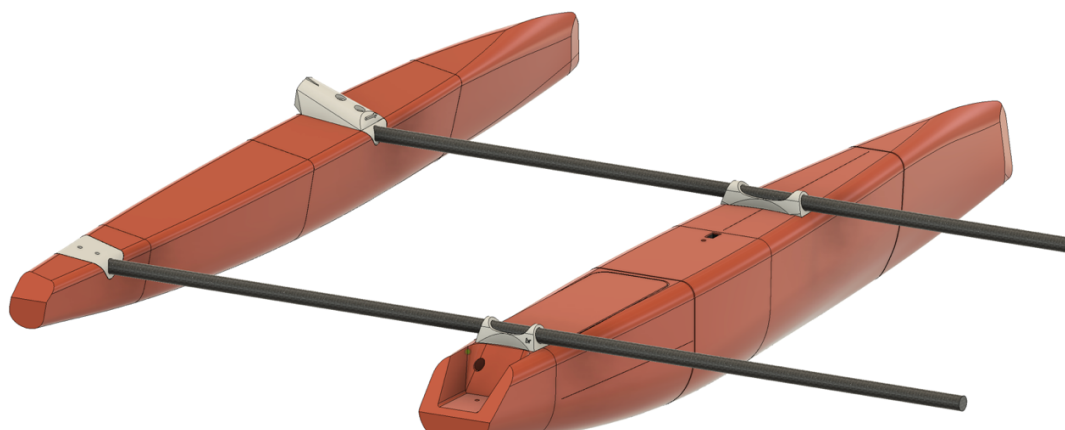
curved (alternative):1



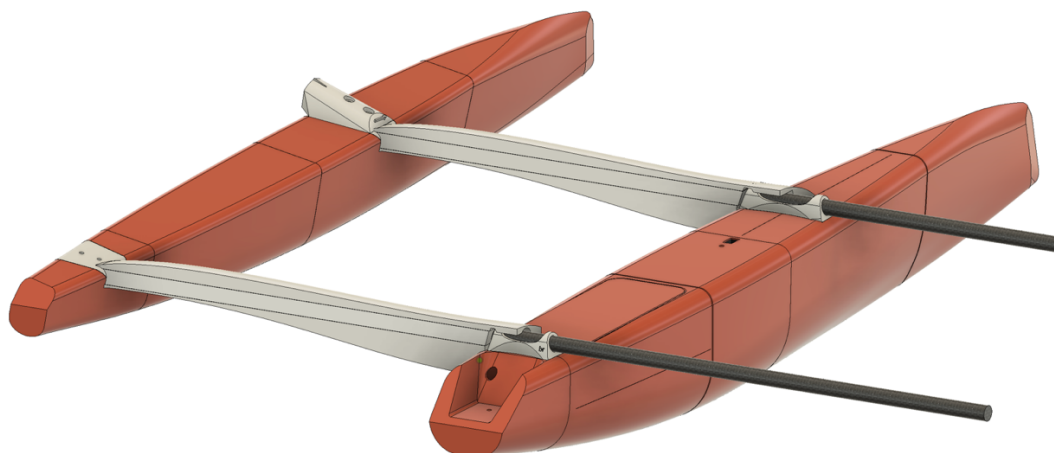
BEAM VARIANTS

You can choose between the following 4 variants. The standard solution is variant 3:

- 1) Carbon Beams without fairing => lightest and simplest version. The beams are attached to the center hull with the "BBneo" parts (BB = beam bracket)

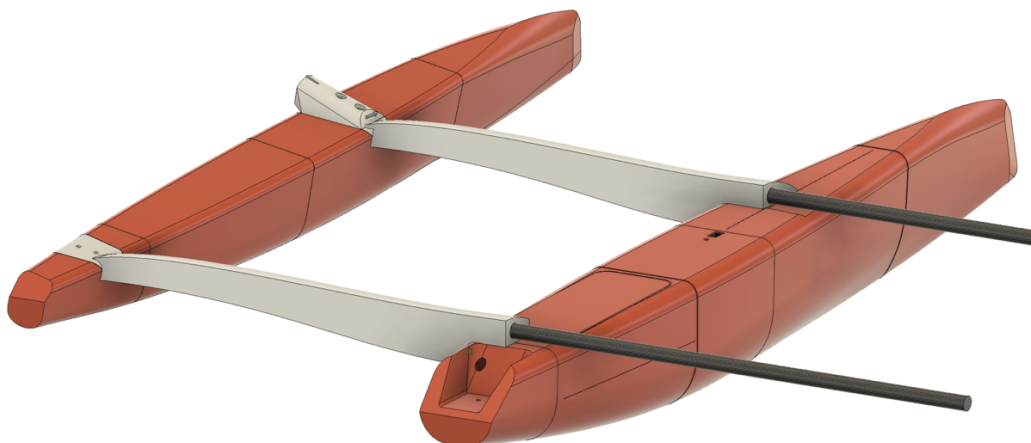


- 2) Carbon beams with demountable fairing

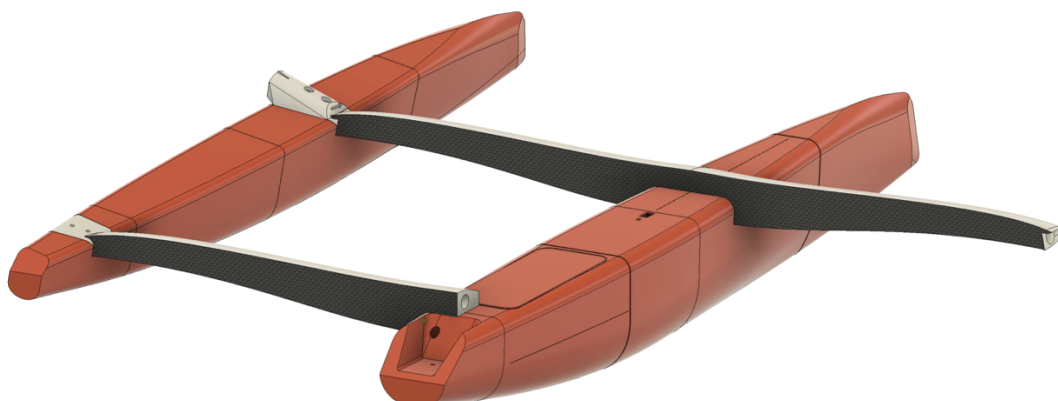


- 3) Carbon beams with fixed fairing => this is the **recommended standard solution** for the AERO20.

The boat is still demountable, yet cool and aerodynamic. Here you don't need the parts "BBneo" as the beams are attached to the hull by gluing the fairing on the center deck.



- 4) Carbon curved beams (without inner carbon tubes but carbon reinforced fairing)

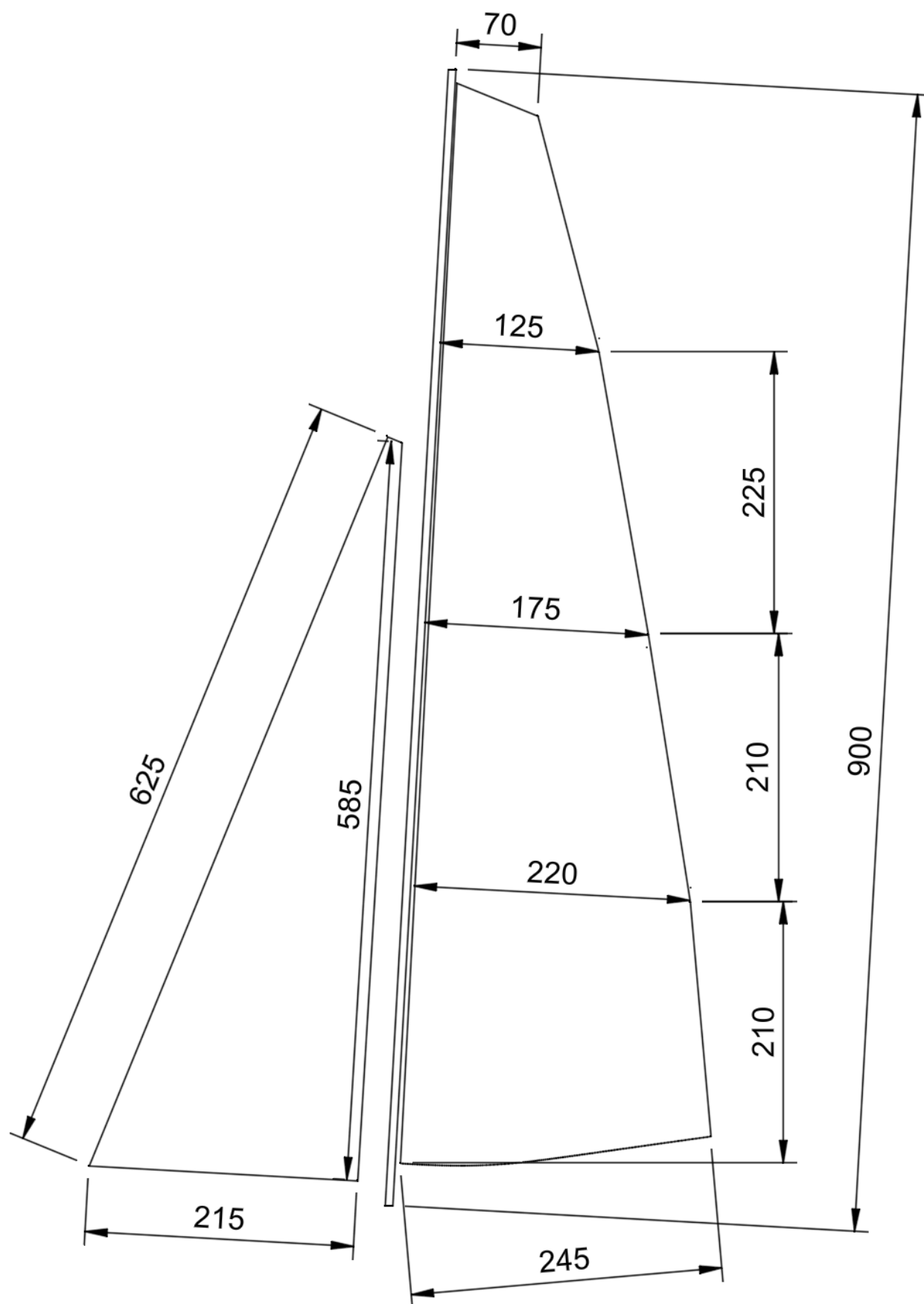


The lengths of the carbon tubes are 680mm for the forward beam and 660mm for the rear beam. Begin by assembling the AMA hulls with the beams to form a catamaran structure. Next, position and adhere this assembled "catamaran" onto the center hull, ensuring proper alignment before proceeding with final gluing. The longitudinal position is determined by the sterns of the hulls which should all align.

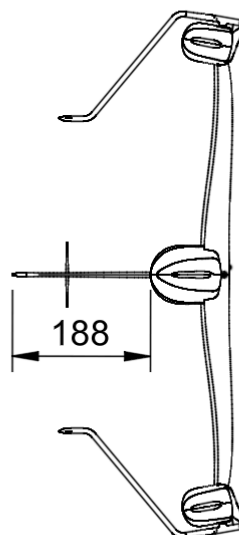
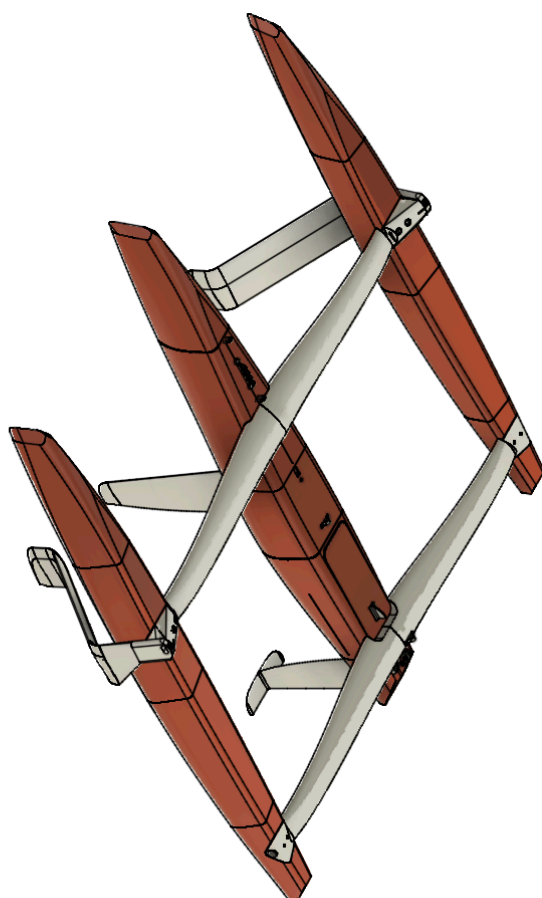
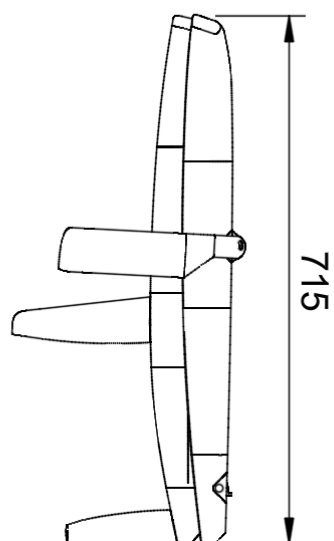
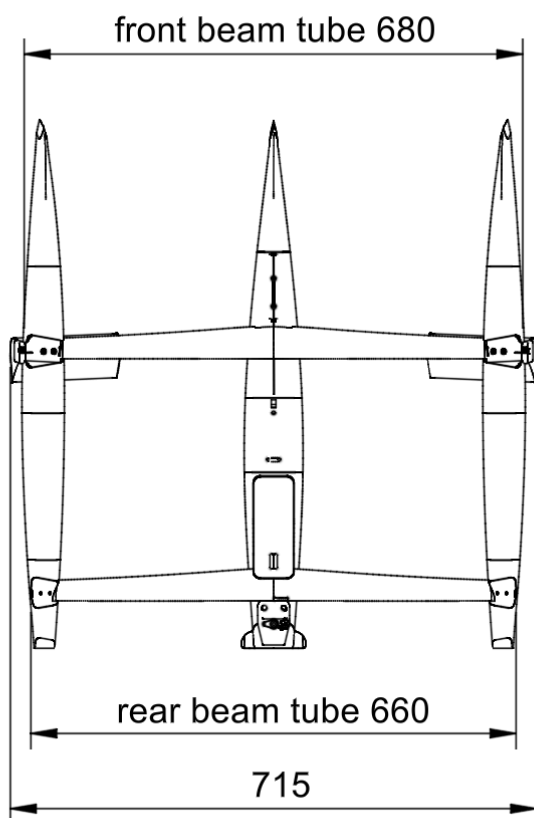
SHEETING & RIG

The sheeting system uses a rubber band to always keep the central sheet under tension. The central sheet goes around back turning block and ends with a hook. Here the two separate sail sheets are attached just like at the DF65.

The rig comes from a DF65 (preferably an A+) or from a RG65. You can also build your own sails using the parts in the file package.







3D printed parts list Aero20	Material	Infill	Quantity	Mirror?	comment
20 Center hull (all printing parameters are suggestions, nozzle 0.4, normal mode)					
BBneo front.stl	ABS/GF or PETG	solid	0	-	only needed for beam variant 1, 2
BBneo rear.stl	ABS/GF or PETG	solid	0	-	only needed for beam variant 1, 2
C1 bow.stl	ABS/GF or LW-PLA	0%	1	-	no bottom/top layers
C2.stl	ABS/GF or LW-PLA	0%	1	-	bottom layers = 3 for transom
C3.stl	ABS/GF or LW-PLA	0%	1	-	
C4.stl	ABS/GF or LW-PLA	0%	1	-	no bottom/top layers
C5 stern.stl	ABS/GF or LW-PLA	0%	1	-	bottom layers = 3 for transom
KEEL BOX.stl	ABS/GF or PETG	solid	1	-	
RUDDER TUBE ondeck.stl	ABS/GF or PETG	10%	1	-	4 walls
RUDDER TUBE.stl	ABS/GF or PETG	10%	1	-	4 walls
30 Ama hull L					
A1 bow.stl	ABS/GF or LW-PLA	0%	1	-	no bottom/top layers
A2 L.stl	ABS/GF or LW-PLA	0%	1	yes	no bottom/top layers
A3.stl	ABS/GF or LW-PLA	0%	1	-	no bottom/top layers
A4 L transom.stl	ABS/GF or LW-PLA	0%	1	yes	Bottom layers = 3 for transom
BRACKET beam forw L.stl	ABS/GF or PETG	10%	1	yes	4 walls
BRACKET beam rear L.stl	ABS/GF or PETG	10%	1	yes	4 walls
BRACKET FOIL upper L.stl	ABS/GF or PETG	10%	1	yes	4 walls
40 Beams					
BEAM curved front L.stl	ABS/GF or PETG	0%	1	yes	beam variant 3 (recommended) and 4
BEAM curved rear L.stl	ABS/GF or PETG	0%	1	yes	beam variant 3 (recommended) and 4
BEAM FAIRING front L (open).stl	ABS/GF or PETG	0%	0	yes	beam variant 2 (alternative to 3)
BEAM FAIRING rear L (open) (1).stl	ABS/GF or PETG	0%	0	yes	beam variant 2 (alternative to 3)
FAIRING BACKWALL BACK L.stl	ABS/GF or PETG	0%	0	yes	beam variant 2 (alternative to 3)
FAIRING BACKWALL FRONT L.stl	ABS/GF or PETG	0%	0	yes	beam variant 2 (alternative to 3)
50 RC					
RC TRAY cage 2.stl	ABS/GF or PETG	10%	1	-	4 walls
RC TRAY frame 2.stl	ABS/GF or PETG	10%	1	-	4 walls
60 Fittings					
CENTER HATCH FRAME V3.stl	ABS/GF or PETG	10%	1	-	4 walls
CENTER HATCH.stl	ABS/GF or PETG	10%	1	-	4 walls
FORESTAY hooks.stl	ABS/GF or PETG	10%	1	-	4 walls
HATCH HANDLE.stl	ABS/GF or PETG	10%	1	-	4 walls
RUDDER ARM (1).stl	ABS/GF or PETG	10%	1	-	4 walls
SHEET POST line.stl	ABS/GF or PETG	10%	1	-	4 walls
70 Appendages					
FOIL L V2.stl	ABS/GF or PLA	10%	1	-	4 walls
KEEL FIN.stl	ABS/GF or PLA	10%	1	-	
KEEL FLANGE aero.stl	ABS/GF or LW-PLA	10%	1	-	4 walls
RG65 T-RUDDER V1.stl	ABS/GF or PLA	10%	1	-	4 walls
80 Stand					
CONNECTOR lower wo name.stl	ABS/GF or PETG	10%	1	-	
CONNECTOR lower.stl	ABS/GF or PETG	10%	1	-	
CONNECTOR upper R.stl	ABS/GF or PETG	10%	1	-	
CONNECTOR upper.stl	ABS/GF or PETG	10%	1	-	
STAND fwd.stl	ABS/GF or PETG	10%	1	-	
STAND rear.stl	ABS/GF or PETG	10%	1	-	

GENERAL REMARKS

Thanks a lot for purchasing this file set. Please let me know if you need support or have feedback.

PLEASE DON'T SHARE THE FILES. A lot of genuine work went into it and there are hundreds of scammers selling other people's intellectual property. As I cannot secure this technically, I depend on you.

You purchased a license to print as many boats and parts as you wish for YOUR OWN PERSONAL USAGE.

When you sell a boat, THE LICENSE GOES WITH IT. Please purchase a new license if you have another boat in use or if you want to build another one. If in doubt, just contact me at info@yachtprint.de

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PRINT IT, BUILD IT, SAIL IT and HAVE FUN!

Your

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