

TRI20 *pure*

A printable RC-trimaran by YACHTPRINT, Chris Angelduro

Version 3.1, 11/2025



The *TRI20 pure* is the first in a trio of trimarans. ultra-light and compatible with DragonFlite65 (DF65) rig, it's quick to assemble and can lift two hulls like larger trimarans. Try to build the boat as light as possible and use light RC components. The boat complies the Mini20-rule and is ready to race.

TECHNICAL DATA of the model:

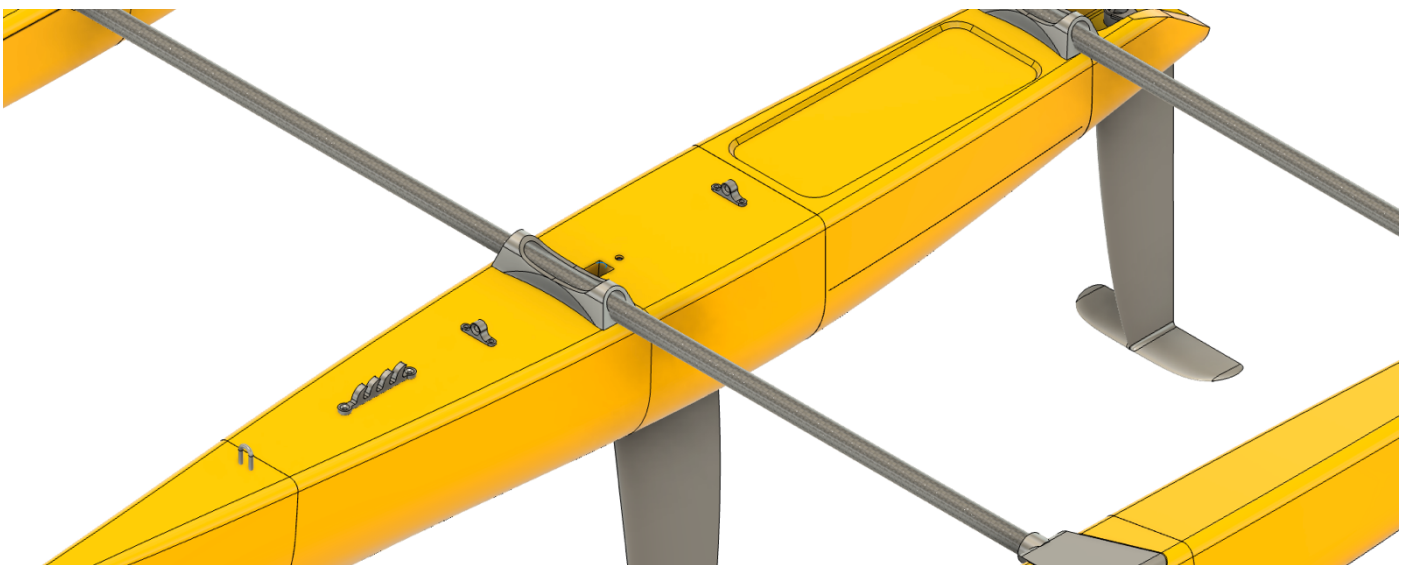
Length	720mm
Width	685 mm



All you need (this is an earlier version with slightly different parts)

PARTS NEEDED BESIDES THE PRINTABLES

- Rig of a DragonFlite65 or similar, use the A-rig or better the A+
- Two 10mm carbon tubes, 1m long with 1mm wall thickness (to be cut to length later)
- Sheet line and 1 ball bearing block or one ball bearings 4x8x3
- 3mm stainless steel- or carbon-rod for rudder and centerboard
- RC: 2-channel transmitter & receiver
- 1 rudder servo (midi or micro), one standard sized sail winch

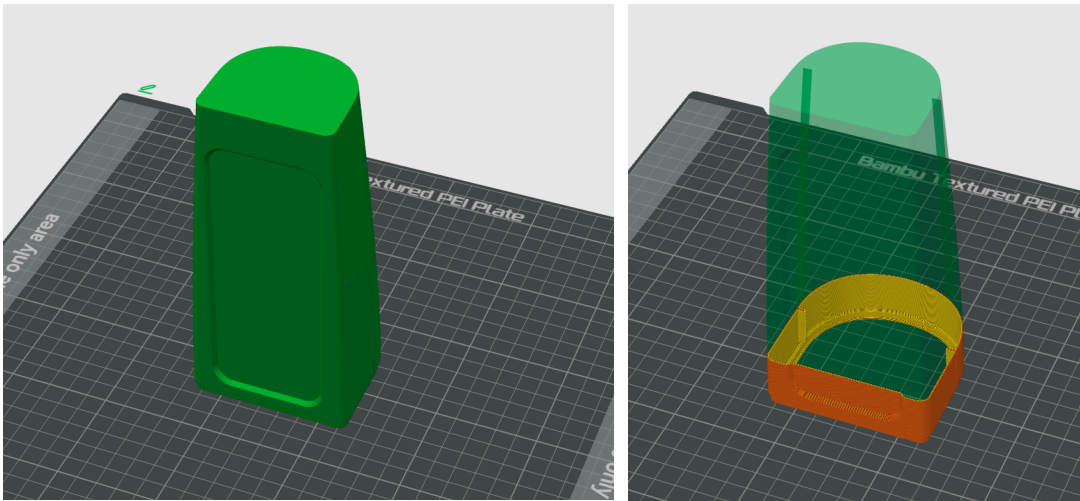


Several iterations lead to a simplified and efficient deck layout (see dimensions further down)

3D PRINTING

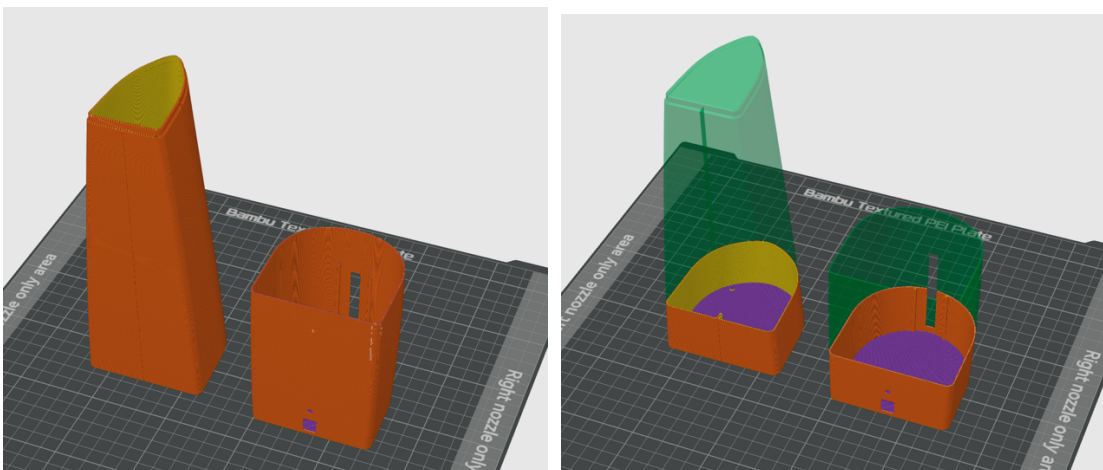
The hulls are printed with LW-PLA. Adjust the flow% (e.g. 50%) and temperature (e.g. 252 degrees C) until you achieve a wall thickness of 1,1mm using 2 walls and a 0.4mm nozzle. (a 0.8mm nozzle and 1 wall is possible as well).

The keel section and the transom of the center hull MUST be printed in normal mode as they are shelled (empty) bodies. All other hull parts bodies are solid (full) bodies and you have to set the infill% to 0% in order to obtain hollow parts.



Most hull parts are solid bodies, so the infill% - as well as the top- and bottom-layers must be set to 0

C2 and C3 are an exception to this. These two sections need flush surfaces to be glued together. Print them as indicated below: C2 upwards-, C3 downwards pointing, with 3-4 bottom layers.



Printing orientation of C2 (left, upwards pointing) and C3 (right, downwards pointing), bottom layers = 4

All other parts are printed in stronger material which can be regular PLA, PLA/HT, PETGm etc. or – if your printer has a heated chamber – ABS/GF.

Parts marked with an “L” belong to the left side of the Ama (side hull). For the right side, THESE PARTS HAVE TO BE MIRRORED ALONG X IN THE SLICER.

INSTRUCTIONS - TRI20 PURE

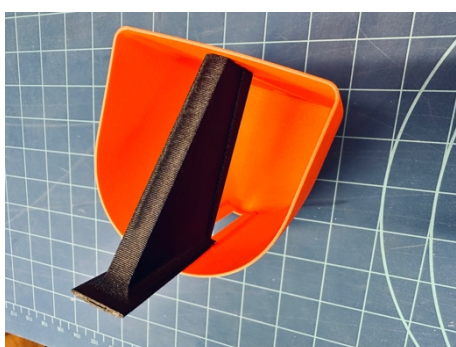
3D printed parts list TRI20 pure	Material	Nozzle	Infill	Quantity	Mirror?	comment
10 center hull						
BBneo front.stl	LW-PLA	0.4	0%	1	-	2 walls/0,24mm layer height
BBneo rear.stl	LW-PLA	0.4	0%	1	-	"
C1 bow.stl	LW-PLA	0.4	0%	1	-	2 walls/0,24mm layer height
C2 jib neo1.stl	LW-PLA	0.4	0%	1	-	2 walls/0,24mm layer height
C3 KEEL BOX V3.stl	PLA or ABS	0.4	100%	2	-	6 walls/0,24mm layer height
C3 mast & keel - shelled.stl	LW-PLA	0.4	100%	1	-	4 walls/0,24mm layer height
C4 RC section.stl	LW-PLA	0.4	0%	1	-	2 walls/0,24mm layer height
C5 transom - shelled.stl	LW-PLA	0.4	100%	1	-	4 walls/0,24mm layer height
CENTER HATCH FRAME V3.stl	PLA or ABS	0.4	100%	2	-	6 walls/0,24mm layer height
CENTER HATCH handle.stl	PLA or ABS	0.4	100%	2	-	6 walls/0,24mm layer height
CENTER HATCH.stl	LW-PLA	0.4	100%	1	-	4 walls/0,24mm layer height
SHEET POST line.stl	PLA or ABS	0.4	100%	2	-	6 walls/0,24mm layer height
20 ama hull L						
A1 bow.stl	LW-PLA	0.4	0%	2	-	2 walls/0,24mm layer height
A2 L.stl	LW-PLA	0.4	0%	1	yes	"
A3.stl	LW-PLA	0.4	0%	2	-	"
A4 L transom L.stl	LW-PLA	0.4	0%	1	yes	"
BEAM BRACKET front L demountable.stl	PLA or ABS	0.4	30%	1	yes	can also be LW-PLA if you glue the platform
BEAM BRACKET rear L demountable.stl	PLA or ABS	0.4	30%	1	yes	can also be LW-PLA if you glue the platform
30 keel & rudder						
KEEL FIN.stl	PLA or ABS	0.4	50%	1	-	print standing on root face with brim
KEEL FLANGE.stl	LW-PLA	0.4	30%	1	-	
KEEL NUT M3.stl	PLA or ABS	0.4	100%	1	-	uses a M3 threaded heat insert (eg Ruthex)
RUDDER.stl	PLA or ABS	0.4	50%	1	-	only for superlight wind
T-RUDDER.stl	PLA or ABS	0.4	50%	1	-	print laying on trailing edge with brim
50 rc tray						
RC TRAY frame.stl	PLA or ABS	0.4	100%	1	-	
RC TRAY cage.stl	PLA or ABS	0.4	100%	1	-	
RC TRAY frame 2.stl	PLA or ABS	0.4	100%	1	-	
RC TRAY cage 2.stl	PLA or ABS	0.4	100%	1	-	
60 rig						
BACKSTAY CRANE.stl	PLA or ABS	0.4	100%	1	-	if you want to build your own rig (instead DF65
BOOM BAND 6mm M2.stl	PLA or ABS	0.4	100%	1	-	"
CLAMP 6mm.stl	PLA or ABS	0.4	100%	6	-	"
FORESTAY ATTACH 6mm.stl	PLA or ABS	0.4	100%	1	-	"
FORESTAY hooks.stl	PLA or ABS	0.4	100%	1	-	"
GOOSENECK boom.stl	PLA or ABS	0.4	100%	1	-	"
GOOSENECK mast.stl	PLA or ABS	0.4	100%	1	-	"
GOOSENECK turning.stl	PLA or ABS	0.4	100%	1	-	"
SHROUD EYE.stl	PLA or ABS	0.4	100%	1	-	"
SPREADER.stl	PLA or ABS	0.4	100%	1	-	"
70 misc parts						
BLOCK small low 4x8x3.stl	PLA or ABS	0.4	100%	1	-	
BLOCK small up 4x8x3.stl	PLA or ABS	0.4	100%	1	-	
RUDDER ARM.stl	PLA or ABS	0.4	100%	1	-	insert a shaft collar in this piece
SAIL SERVO ARM.stl	PLA or ABS	0.4	100%	1	-	if you want to use a servo instead of a winch
water plug.stl	TPU	0.4	100%	1	-	
80 stand						
Connector down L.stl	PLA or ABS	0.4	100%	1	-	
Connector up L.stl	PLA or ABS	0.4	100%	1	-	
Stand high forward.stl	PLA or ABS	0.4	100%	1	-	
Stand high rear.stl	PLA or ABS	0.4	100%	1	-	

ASSEMBLY

Slide in and glue the keel box in the respective C3 center hull section. Use all the surface between the keel box and the hull around the bottom in order to get this area watertight. The keel section C3 and the jib section C2 have flush mating surfaces in order to form a bulkhead for stability around that stressed area. Glue them together flush and cut out two holes in the bulkhead as potential water drain.



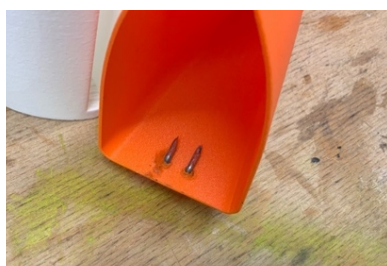
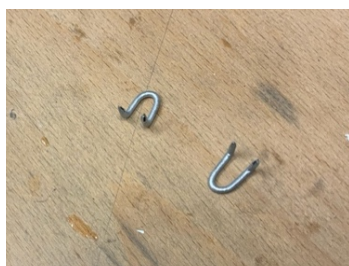
Part C3 hull and the extra keel box. Print the keel box solid with multiple walls.



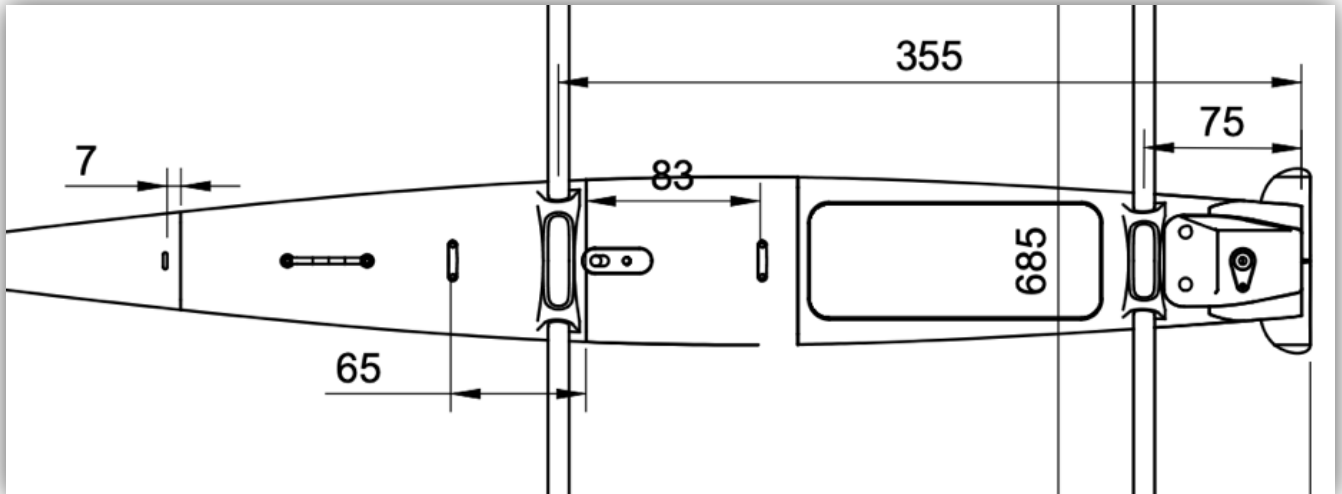
Sliding the keel box in the hull section with a tight fit. The section should be 100% watertight

All other hull sections are joined using a flange. Before gluing the hulls together, install the RC tray in the RC section of the center hull C4. There are two alternative options for the RC board and it's best to fit the RC tray with all RC components included before closing the hull. Then, install the hatch frame. To fit the hatch frame, cut out the hatch hole by following the printed recess on the deck.

Then, install the deck eyes. You can produce your own eyes as shown below. For the sheets you can use those eyes as well OR use the printable deck eyes. To make deck eyes, start by bending a wire into a U-shape and cutting it down to about 15mm in length. Next, bend both ends at 90 degrees in the same direction, then insert them into two small holes on the deck and fix them with epoxy. Pay attention to how the ends are positioned—they must press firmly against the deck when under load. The specific spots for installing deck eyes are shown in the plan below.



The deck eyes are simple wire bents



Positioning of deck eyes and beams on the center hull

Cut the 10mm beam tubes to **680mm** for the front beam and **660mm** for the rear beam. You can glue the beams directly into the ama hulls or fix the beam brackets only while securing the beams with a screw. By that the boat can be disassembled (which I never found to be necessary though....).

Once the beam tubes and amas are assembled, double-check that everything is perfectly aligned, flush and parallel. Take a moment to verify symmetrical alignment before glueing. Position the amas and beams on the center hull according to the dimensions in the picture above and glue everything to the deck.

CENTERBOARD & RUDDER

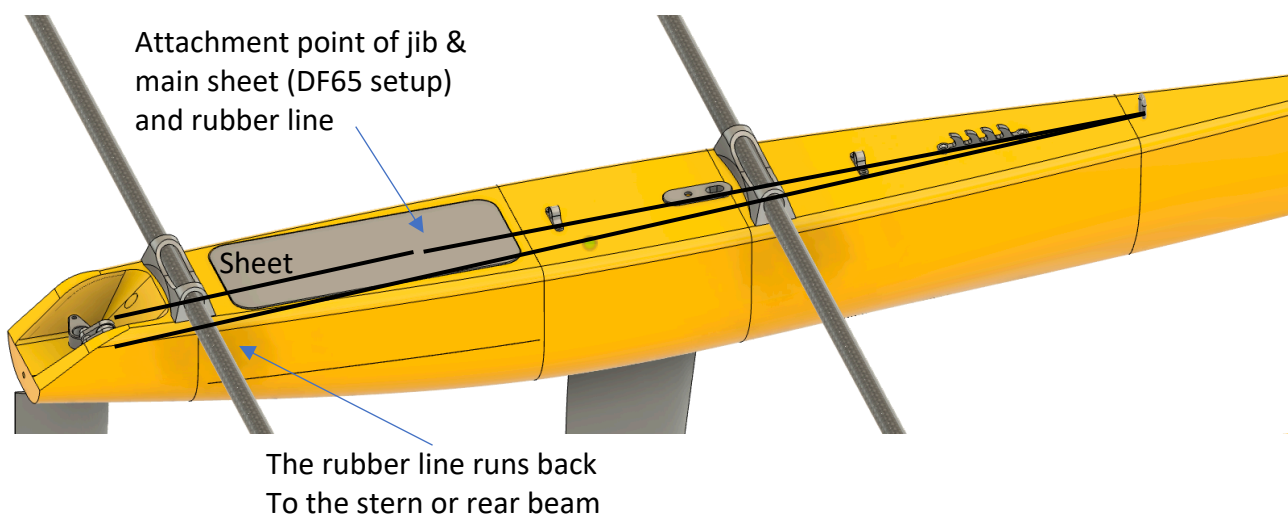
Print files are available for both a centerboard and T-rudder. For the centerboard, use PLA, ABS, or carbon-reinforced material, and mount it with two 3mm rods—one for strength, one for alignment. Glue an M3 thread at the flange's top; secure it through the hull deck with an M3 nut or a printed nut with a heat sink insert.

The rudder uses a 3mm steel rod as its axis and is attached to the hull's transom piece. Use the printable rudder arm and a shaft collar for 3mm shafts.

SHEETING

The sheet lines for main sail and jib are attached on a sheet that runs over a block (see pic above) in the transom and which is pulled by the sail winch. The STL-files for the little block use a standard 4x8x3mm ball bearing and M2,5 screws.

To hold the sheet line under tension when eased, a rubber line is attached to the sheet. The rubber line runs to the forestay eyelet - preferably through a small block - and back to the end of the hull. By that the sheet does not come off the drum of the sail winch.



The main sheet and jib sheet are attached to the same point (loops going into a hook) and through their respective deck eyes before being attached to the booms. Make sure, the jib booms opens up to approx. 12 degrees and the main boom to 0-2 degrees when sheeted in fully.

This earlier version shows the sheeting setup according to the DF65 in order to use that rig. It is a setup with sail servo arm. When using a sail winch (which is recommended), you need a rubber band described above to keep the sheet under tension.

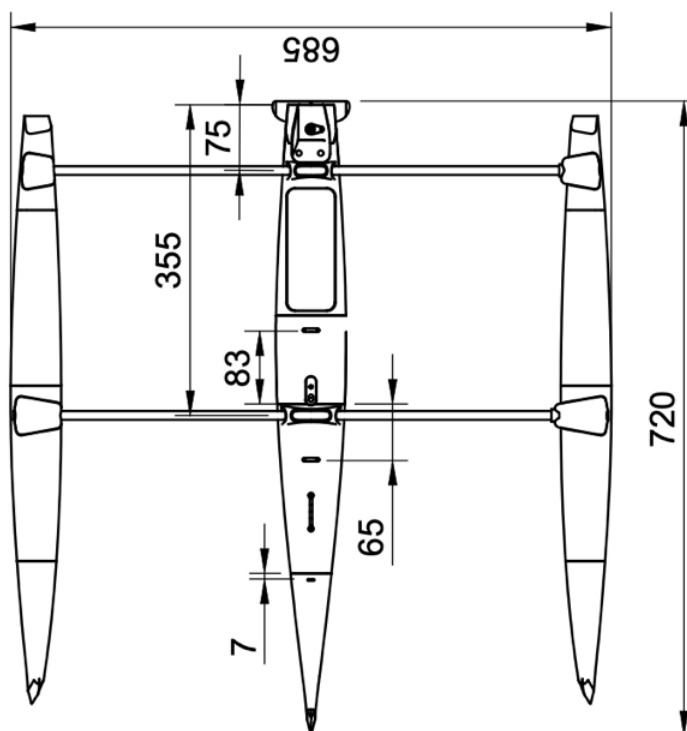
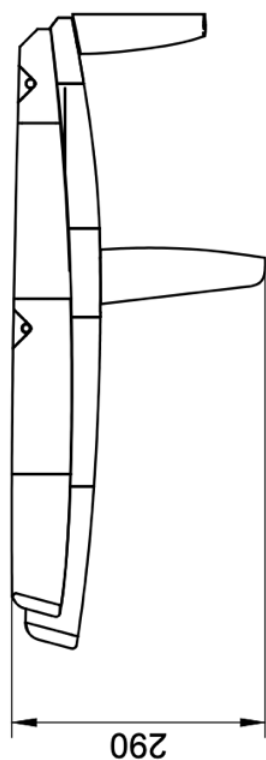
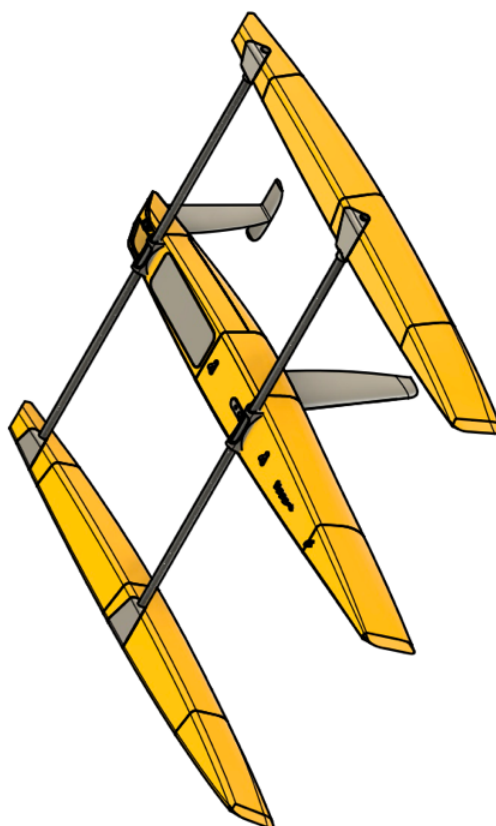
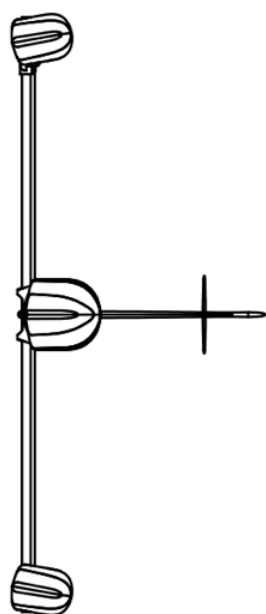
RIG and SAILS

The rig is a standard DF65 rig with a 5mm pin that goes into the mast box. The A+ rig fits to the boat even better. There are no shrouds but a backstay just like the DF65 setp. Rig fittings are included as STL if you want to build an own rig. Refer to the Mini20 rule (see file package) if you want to participate in races.

FINISH

Covering the hulls with epoxy or a thin glass laminate improves stiffness and durability but adds weight, so benefits must be weighed against the extra mass.

IF YOU HAVE ANY QUESTIONS, PLEASE DON'T HESITATE TO CONTACT US VIA info@yachtprint.de



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Your

Chris Angelduro
YACHTPRINT

