

MOD20 RC Trimaran

by Chris Angelduro

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INTRODUCTION

MOD20 trimaran is a scaled down version of the larger *MOD40*. The hull lines are modified to scale as well as to carry a proper RC equipment suitable for that size. The MOD20 is class legal to the newly established **Mini20 class rule** for small multihulls. The rig of the DF65 can be used as well as the rudder and fin (centerboard) from my other small trimaran, the Tri65. **Please don't share the files.** Thanks!

TECHNICAL DATA

Length 720 mm
Width 720 mm
Height 925 mm above deck, DF65 mast
Weight 650 g incl. battery (RTS)

MINIMUM PRINTER VOLUME (X/Y/Z)

MOD20 100/100/205

in comparison:

Prusa MK4 250/210/220

Bambulab A1 256/256/256

ADDITIONAL PARTS & RC

Besides the printables, the following parts are needed:

- 2-channel RC transmitter/receiver system incl. battery, e.g. used Graupner or new Radiomaster
- Mini Servo for rudder, max 24x12,5 (length/width in mm), e.g. SAVÖX SH 0264 MG+
- Midi Servo for sail, 5-7kg strength, watertight, max 30x15,4, e.g. SAVÖX SW-0250 MG+
- Sheet line and block, alternatively 1 ball bearing 4x8x3 for the printable block
- Sails and rig of a DF65-sized sailboat or you diy build your own rig from the STL included
- 3mm stainless steel rod for rudder axis and centerboard, according aluminum tube as rudder stock
- 200g carbon and 75-100g glass fiber reinforcement and epoxy, e.g. from www.r-g.de
- Plastic glue like *UHU Hartkunststoff* or superglue, 5 minutes epoxy glue

For parts- and supplier reference please also check the website www.boatprint.de

3D PRINTING

The boat is designed for LW-PLA with reinforcement of glass fibers and carbon. Print the hull parts with a 0,8mm nozzle, as it brings lot of speed and more strength. All hull STL parts are solid bodies but are printed hollow, so set infill = 0%. Printing direction is upright except for C3 which is printed on its front wall. Top - and bottom layers are usually set to 0 except for C4/Ama4 for the transom, C3 front wall and C2 rear wall.

The ama hulls and section 1 and 4 of the center hull are printed with **one wall** of 1,0-1,1 mm thickness. Adjust temperature and material flow until you achieve that thickness (250 degr. C and 52% in my case). Section 2 and 3 of the center hull as well as the curved beams are printed with **two walls instead**. This is necessary for stability and water tightness. The servo tray is also printed in LW-PLA.

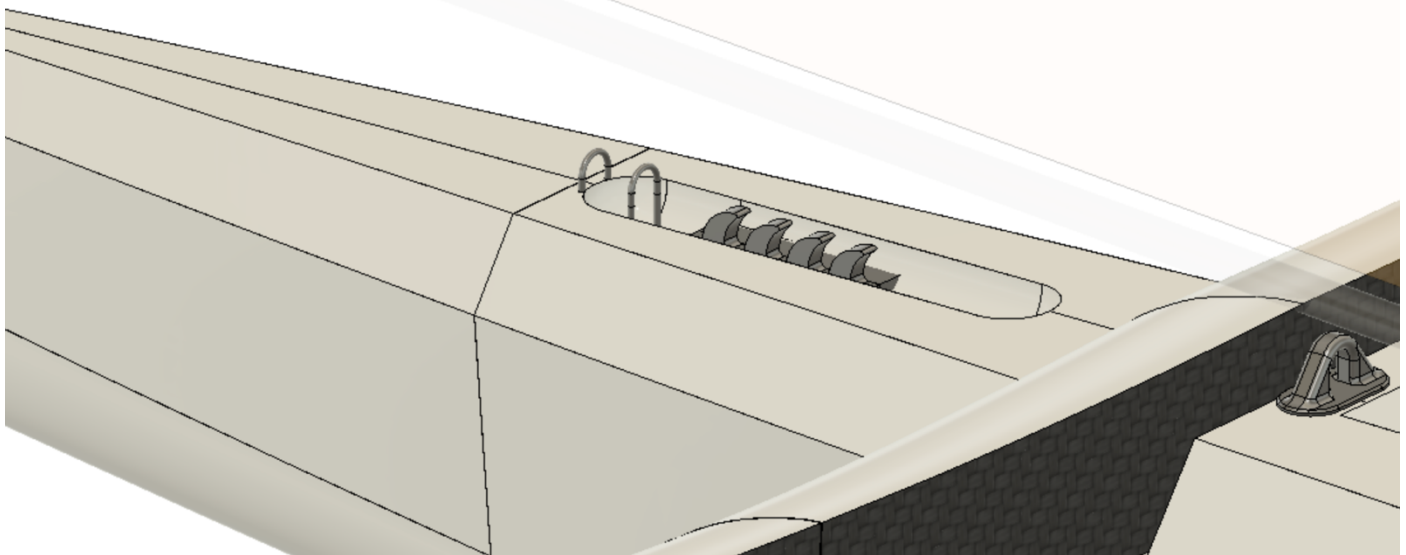
All other parts can be printed in PLA, PETG or any other stronger material.

ASSEMBLY

Make sure to fit the hull segments tightly in order to achieve the class legal length of maximum 72cm.

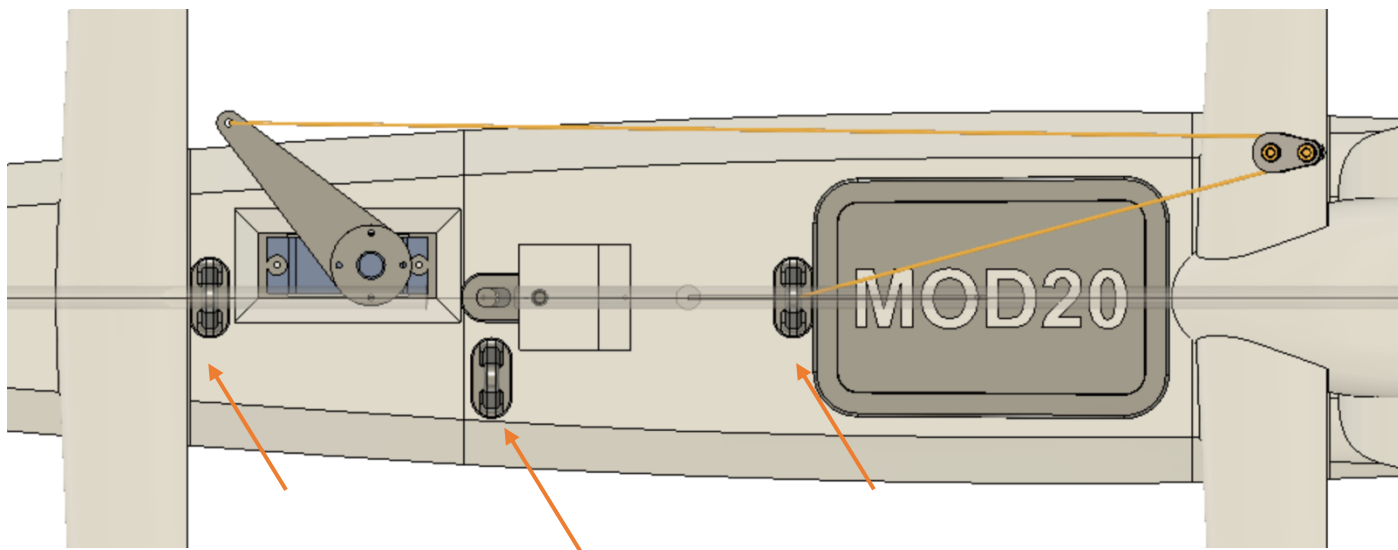
STEP 1: The hull sections for the outside ama-hulls are glued together using the flange. Before closing the hulls, you may want to reinforce the areas where the beam attach. I suggest to reinforce them from the inside with a thin glass layer and superglue or 5min epoxy.

STEP 2: Center hull: before gluing the bow section 1 and the forestay section 2 install 1-2 eyebolts in front of the recess in section 2 and one more just behind the edge. The eyebolts can also be bend wire. Install the forestay hooks on its base and glue it in a bit behind the rear eyebolt.



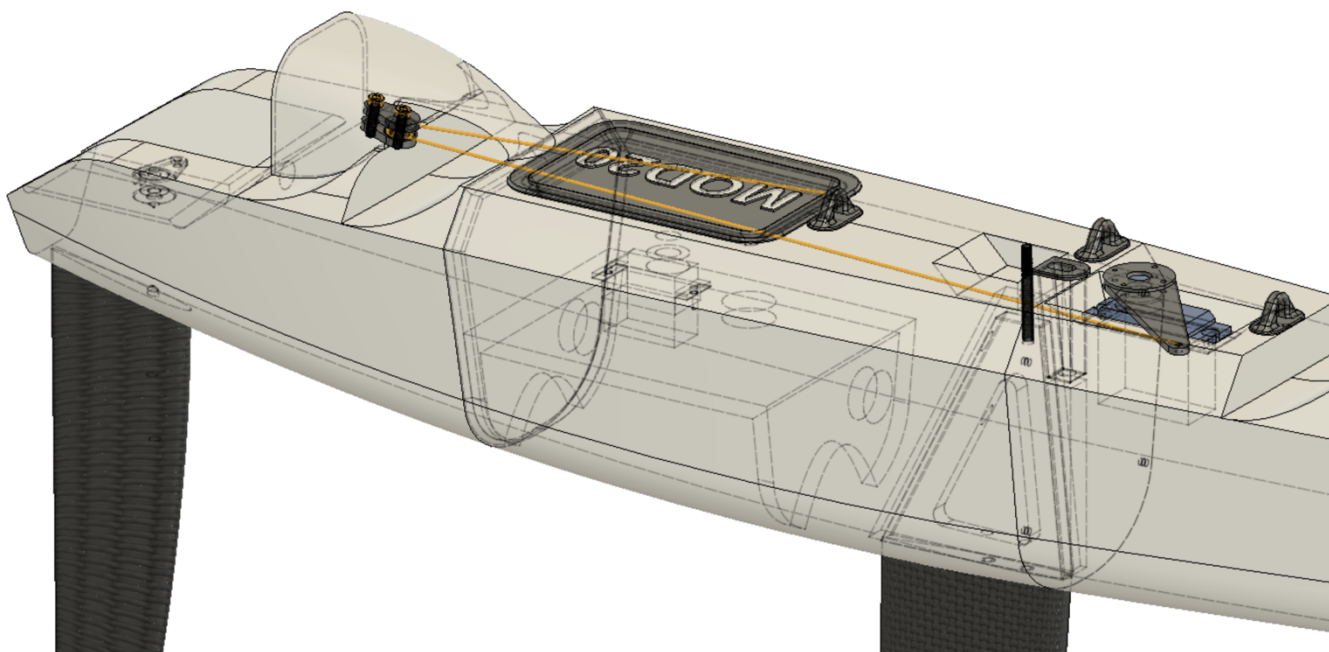
STEP 3: Cut out the hole for the servo leaving a small edge for gluing the servo plate. Install a midi-sized servo of min 7kg force as sail servo and lead the cable to the rear of the segment. Segments 2 and 3 are glued flush without a flange. This give more strength in that critical are. Only cut small holes for water pass through and for the servo cable in the vertical walls of section 2 and 3.

STEP 4: Glue the mast base and the three printed eyelets according to the following positions:



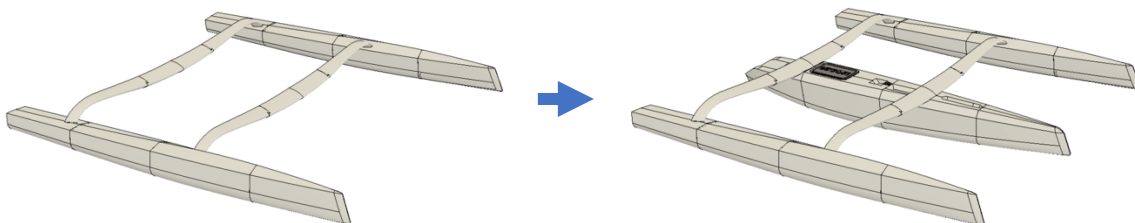
Install then the micro-sized rudder servo including a wire link for the rudder horn on the servo tray and glue it in section 3. You can use Velcro tape to install the receiver and battery right next to the rudder servo. You may want to seal the centerboard case against water leakage at this point of time. Use epoxy or liquid rubber for that. After gluing the hatch frame, you can glue section 2 and 3 together.

STEP 5: Press in a shaft collar (8mm outside-, 3mm inside mm) in the rudder horn and attach it at the right length to the wire link coming from the rudder servo. Install an aluminum or carbon tube for the rudder stock. Make it watertight from the inside with a bit epoxy. Now you can finish up the center hull by gluing section 3 and 4 together.



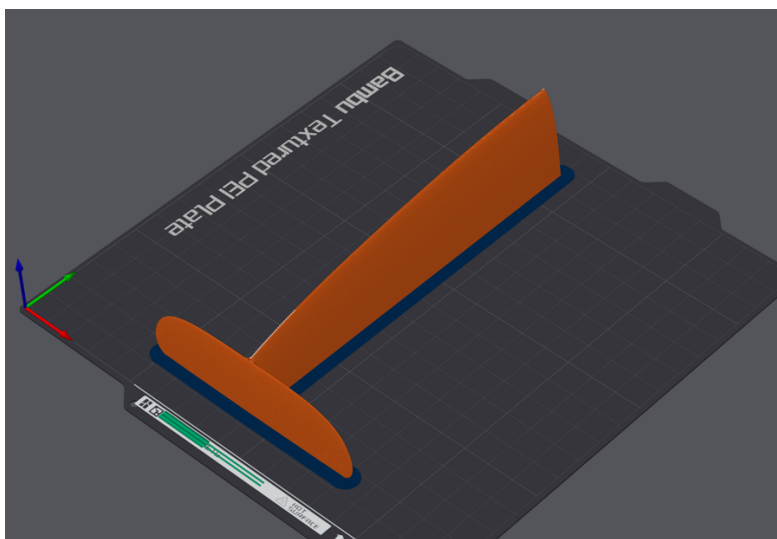
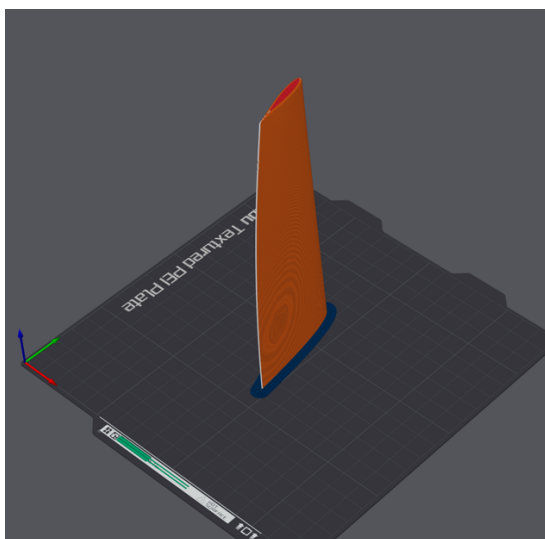
STEP 6: Glue the beams lying on a flat surface and sand the smooth. You have to reinforce the backwall of the beams with 200g carbon and epoxy at minimum. I recommend to wrap the d-section of the beams with a thin glass layer in addition. This is needed so that the beams can take the load.

STEP7: all comes together now. Glue the beams to the ama hulls first. They have recesses so you obtain a straight and symmetrical platform. In a second step you can glue this platform on the center hull. Take some time measuring and marking the center lines before fixing everything. The trimaran must be absolutely parallel and symmetrical. Finally, you can glue a hood on the rear beam.



STEP 8: Install a block on the rear beam on the right side as shown on the pictures. You can use the printable blocks in the file package together with a 8x4x3 ball bearing and M2,5x10mm screws. The main sheet runs from the servo arm through the block and through the first printed eyebolt. The jib sheet runs through the two additional eyebolts.

STEP 9: Install a standard DF65 A or A+-rig and connect the sheet lines to the booms as intended. The centerboard is printed upright with a brim. It gets stability from two steel pins inserted into the profile. The rudder is printed laying on the thin trailing edge using a brim. Let it "sink in" the build plate in the slicer by 4-5mm in order to obtain a certain minimum width of the trailing edge.

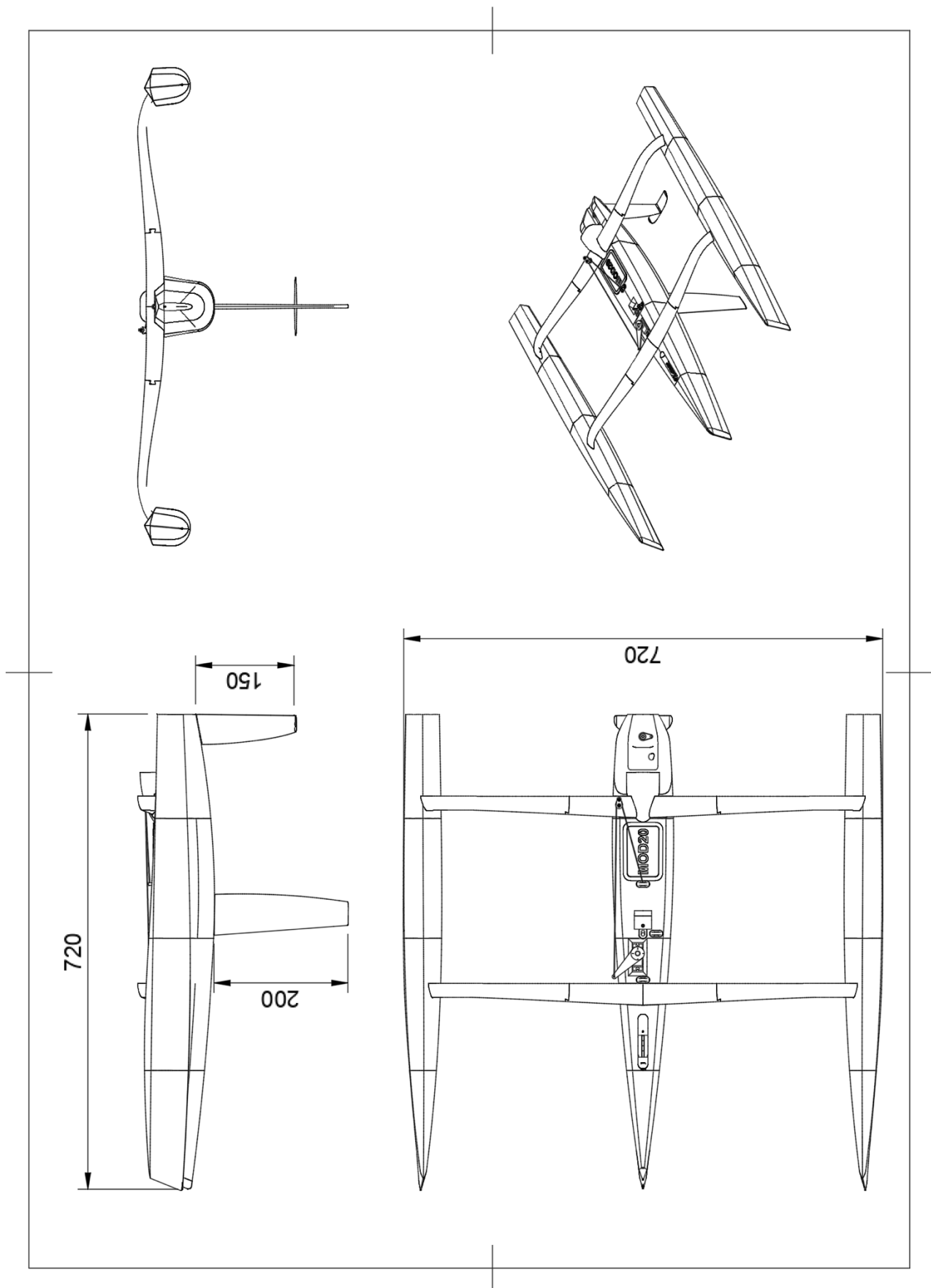


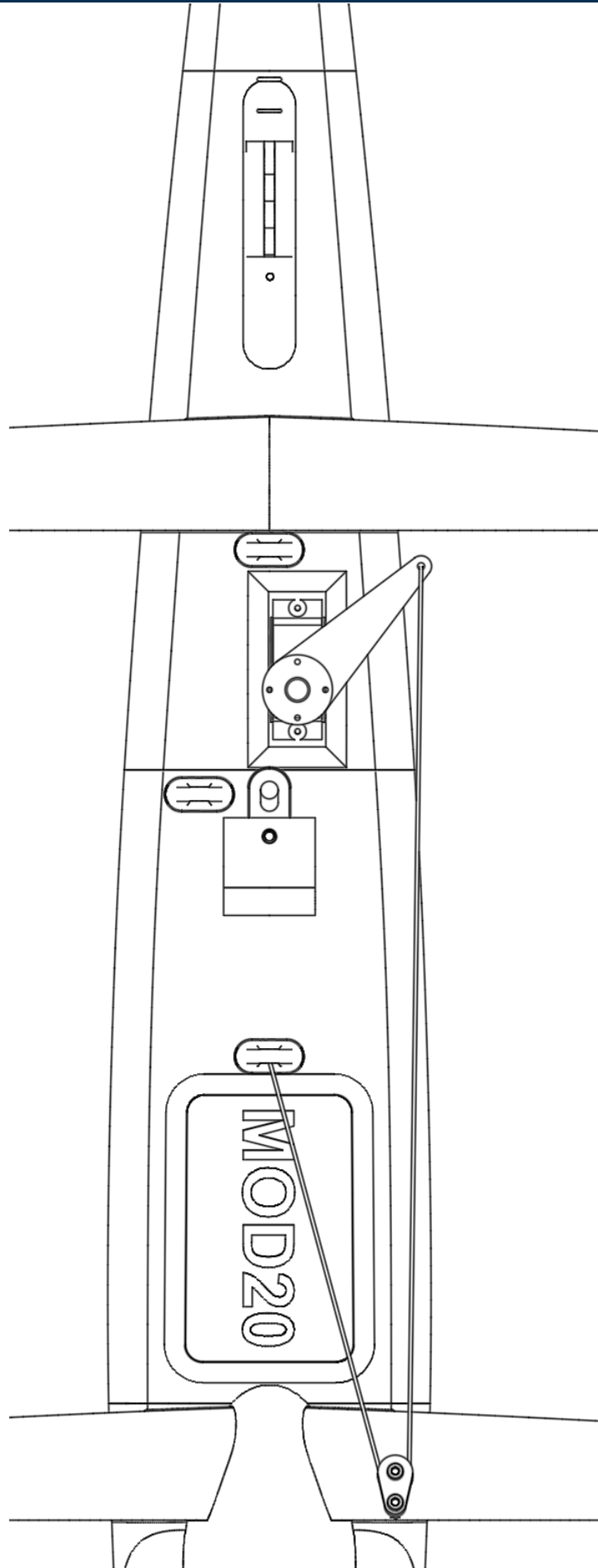
STEP 10: There is a boat stand included which holds the center hull. The rear and forward printable parts are connected with two rods or tubes of 250 mm length and a diameter of 6 mm.

QUESTIONS & CONTACT

Please contact *Chris Angelduro* via the MESSENGER app in Facebook

DRAWINGS





3D printed parts list	Material	Nozzle	# walls	Comment
10 Center hull				
CENTER curved 1 bow.stl	LW-PLA	0.8	1	
CENTER curved 2 forestay.stl	LW-PLA	0.8	2	2 walls for strength
CENTER curved 3 mast fin.stl	LW-PLA	0.8	2	2 walls for strength
CENTER curved 4 transom.stl	LW-PLA	0.8	1	
HOOD.stl	LW-PLA	0.8	1	
20 Ama hulls				
AMA curved 1 L bow.stl	LW-PLA	0.8	1	
AMA curved 1 R bow.stl	LW-PLA	0.8	1	
AMA curved 2 L.stl	LW-PLA	0.8	1	
AMA curved 2 R.stl	LW-PLA	0.8	1	
AMA curved 3 L.stl	LW-PLA	0.8	1	
AMA curved 3 R.stl	LW-PLA	0.8	1	
AMA curved 4 L transom.stl	LW-PLA	0.8	1	
AMA curved 4 R transom.stl	LW-PLA	0.8	1	
30 Curved beams				
Beam front L.stl	LW-PLA	0.8	2	2 walls for strength, additional carbon needed
Beam front middle.stl	LW-PLA	0.8	2	2 walls for strength, additional carbon needed
Beam front R.stl	LW-PLA	0.8	2	2 walls for strength, additional carbon needed
Beam rear L.stl	LW-PLA	0.8	2	2 walls for strength, additional carbon needed
Beam rear middle.stl	LW-PLA	0.8	2	2 walls for strength, additional carbon needed
Beam rear R.stl	LW-PLA	0.8	2	2 walls for strength, additional carbon needed
40 Rc & deck fittings				
BLOCK 8x4x3 lower.stl	PLA	0.4	2	
BLOCK 8x4x3 upper.stl	PLA	0.4	2	
Eyelet.stl	PLA	0.4	2	
FORESTAY base.stl	PLA	0.4	2	
FORESTAY hooks.stl	PLA	0.4	2	
HATCH handle.stl	PLA	0.4	2	
MASTBOX MOD20.stl	PLA	0.4	2	
PUSHROD SEAL - TPU.stl	TPU	0.4	2	
RC HATCH FRAME.stl	PLA	0.4	2	
RC HATCH.stl	PLA	0.4	2	
sail servo arm.stl	PLA	0.4	2	
Sail Servo mounting plate.stl	PLA	0.4	2	
Sailservo plate midi.stl	PLA	0.4	2	
Servo tray micro.stl	LW-PLA	0.8	2	
50 Rigging parts				
BACKSTAY CRANE.stl	PLA, PP-CF	0.4	2	Just if you want to DIY, use a rig from the DF 65
BOOM BAND 6mm M2.stl	PLA, PP-CF	0.4	2	Just if you want to DIY, use a rig from the DF 65
CLAMP 6mm.stl	PLA, PP-CF	0.4	2	Just if you want to DIY, use a rig from the DF 65
FORESTAY ATTACH 6mm.stl	PLA, PP-CF	0.4	2	Just if you want to DIY, use a rig from the DF 65
GOOSENECK boom.stl	PLA, PP-CF	0.4	2	Just if you want to DIY, use a rig from the DF 65
GOOSENECK mast.stl	PLA, PP-CF	0.4	2	Just if you want to DIY, use a rig from the DF 65
GOOSENECK turning.stl	PLA, PP-CF	0.4	2	Just if you want to DIY, use a rig from the DF 65
60 Appendages				
KEEL FIN MOD 20 short.stl	PLA, PP-CF	0.4	15	either this one...
KEEL FIN MOD 20.stl	PLA, PP-CF	0.4	15	or this one. As you prefer
KEEL FLANGE MOD20.stl	LW-PLA	0.8	2	
RUDDER ARM.stl	PLA, PP-CF	0.4	2	
T-RUDDER MOD20.stl	PLA, PP-CF	0.4	15	
70 boat stand				
Stand forward.stl	PLA	0.8		
Stand rear.stl	PLA	0.8		

GENERAL REMARKS

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

You can use third party printing services but PLEASE MAKE SURE THEY DELETE THE FILES after printing.

If you consider building up a fleet, e.g. for club racing, ask me for a VOLUME DISCOUNT starting at 3 units.

If you run into problems, have any questions or If you wish changes to certain parts PLS CONTACT ME.

ACTIVELY post about your project in the Facebook community. I love discussing and gathering new views.

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

Your

Chris Angelduro
YACHTPRINT

