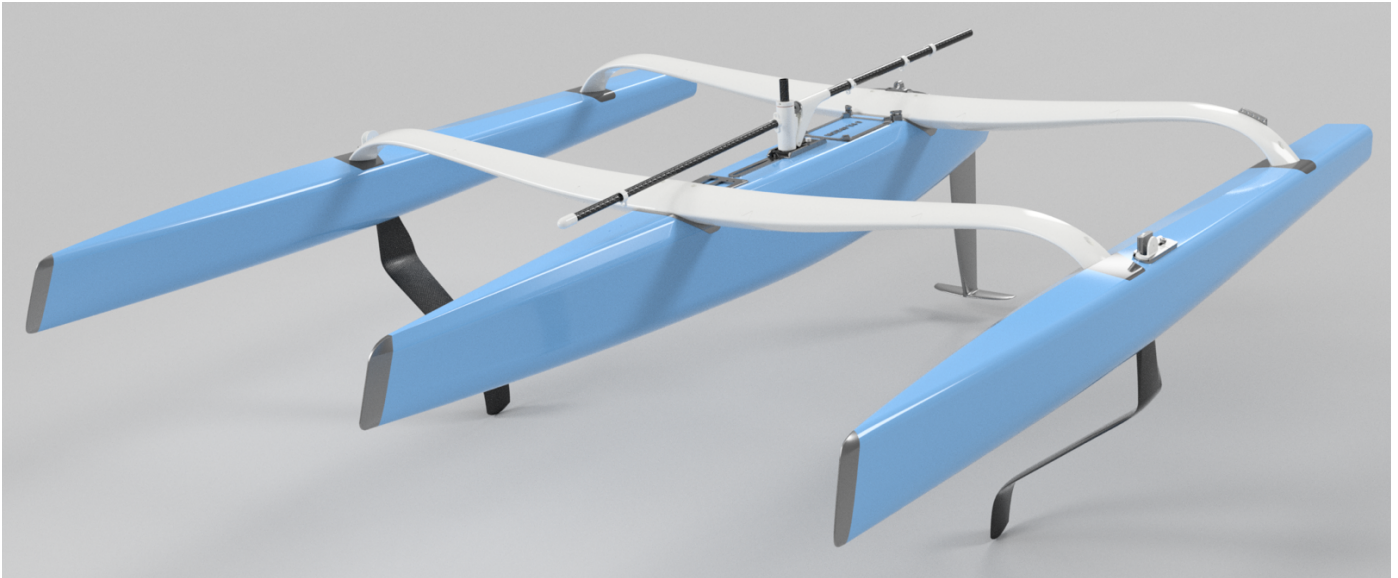


MOD40 foiling race trimaran

by Chris Angelduro

Version 4.0, 05/2025



INTRODUCTION

The MOD40 XL (MOD = MultiOneDesign) is derived from real size MOD70 trimaran class. The boat is a dimensionally maxed out, 3D printable, demountable trimaran for the MINI40 class. This version 4.0 is the final iteration of the boat. It is a proven platform that is fast and uncomplicated to sail and that is capable of foiling. The MOD40 is class legal to the newly established **Mini40 class rule** for small multihulls.

Please don't share the files. Thanks!

TECHNICAL DATA

Length 1220 mm
 Width 1200 mm
 Height up to 2100 mm above deck
 Weight 1800-2200 g incl. battery (RTS)

MINIMUM PRINTER VOLUME (X/Y/Z)

MOD40	205/205/205
<i>in comparison:</i>	
Prusa MK4	250/210/220
Bambu Lab 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+
- Winch servo, e.g. GRAUPNER Regatta, RMG 290, Windforce 2207HV
- Sheet line and block, alternatively 1 ball bearing 4x8x3 for the printable block
- Mini40 sized sails and rig, see sailplan below
- Stiff centerboard and rudder with T-foil, see text below
- Threaded inserts for PLA sizes M4 and M3, e.g. from "Ruthex"
- 4mm stainless steel/titanium rod for rudder axis, corresponding aluminum tube as rudder stock
- 200g carbon and 75-100g glass fiber reinforcement and epoxy, e.g. from www.r-g.de
- Plastic/PLA glue like UHU Hartkunststoff, thick superglue or 5 minutes epoxy

Printing

The hull sections are printed with LW-PLA or even better LW-ASA if your printer can handle it. The sections are printed in “vase mode”. In combination with a 0.8mm nozzle a complete hull can be printed in one day. Adjust flow-% and temperature until you achieve a wall thickness of 1,0-1,1mm. For Vase Mode in Cura go to “Surface Mode” and click “Both” and “Spiralize Outer Contour”. The front-bumpers are printed from middle-soft TPU to absorb crashes. They are Mini40 class-mandatory. If you don’t want to sail races (and eventually sink other boats 😊), you can print them in PLA as well. All other parts are printed in regular PLA, PETG preferably with carbon fiber (CF).

General remark: the material recommendations are indicational. You can also use different material like PETG or carbon fiber reinforced filament. Just make sure you keep a light weight throughout the build.

Several parts are marked with an “L” for the left side => For the right side, just mirror them in the slicer

Hulls assembly

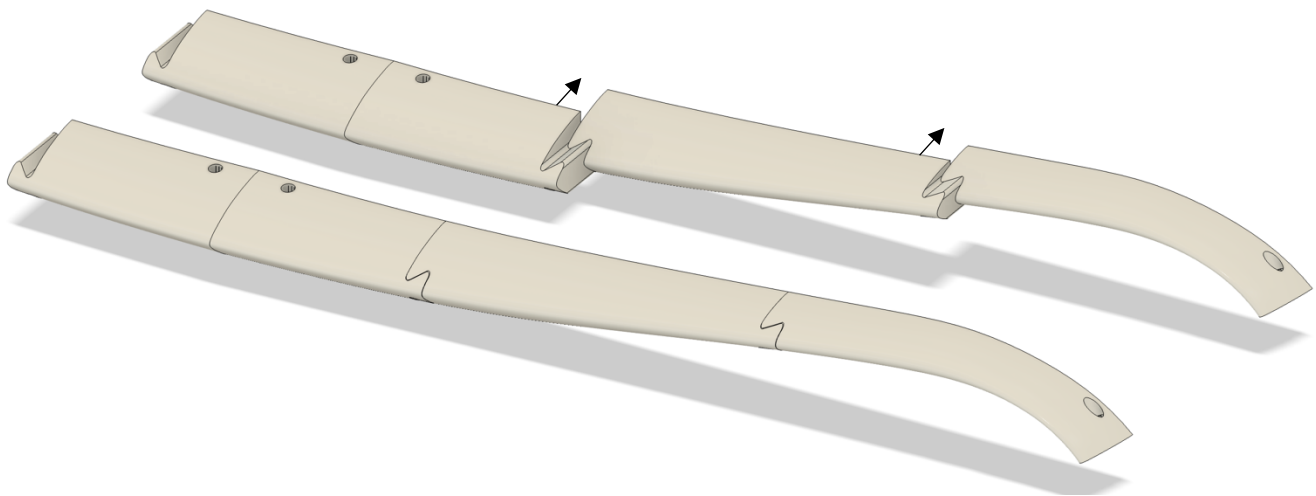
Before gluing the sections, the internal parts must be mounted. The parts are in the print file folders for the center hull and ama hull. Make sure to reinforce the shroud- and forestay fittings, eg with carbon plates so you can tension the rig sufficiently later on.

Glassing and Epoxy

The hulls must be sanded slightly to open up the pores before glassing. The hull shells are glassed with 25-75g glass cloth whereas the deck areas can be covered with epoxy only. The LW-PLA will suck in the epoxy a bit and stiffens the hulls while making it watertight as well. The centerboard case must be sealed with epoxy or better be glassed over to make it watertight.

Curved beams

The curved beams also print in “vase mode”. The single sections are connected by a sliding dove tail connection. NOTE: the dove tails are tapered, meaning you can only slide them together in ONE direction. Try out which direction goes easy at the start and you have the right direction as shown below.

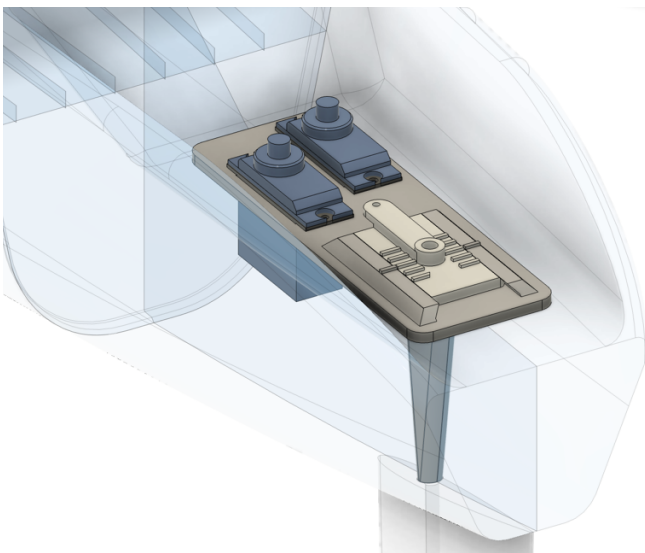


The segments should have a tight fit connection without pressing. Therefore, there are three variants of clearance between the segments available. Try the middle one with 0.3mm clearance first and switch to a tighter (0.2mm) or looser (0.6mm) connection if necessary.

The beams need carbon reinforcement e.g. at the backwall 1-2x 200g carbon. The forward C-shape should be laminated with 49g glass minimum. The boat is designed to be assembled with three hulls and two beams, secured by screws. To save weight you can also permanently glue the beams to the center hull.

Rudder with adjustable angle of attack

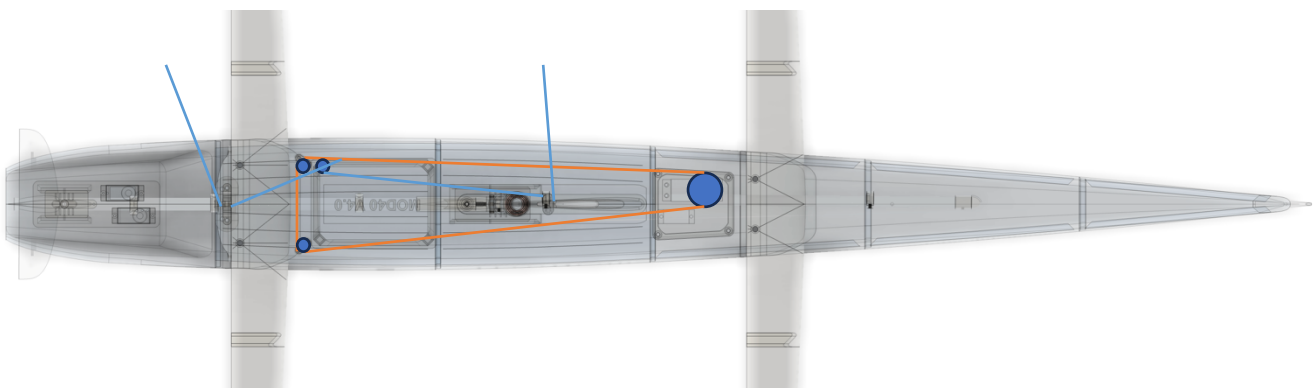
The rudder can be tilted to allow more or less lift from the T-foil. This is necessary to tune in the right balance for foiling. The tilt can be done manually or via a second servo. A skid plate is moved forward and backward for the adjustment. If you use a second servo you have to mix the adjustment servo to the rudder servo in the same direction so that the rudder deflection stays neutral.



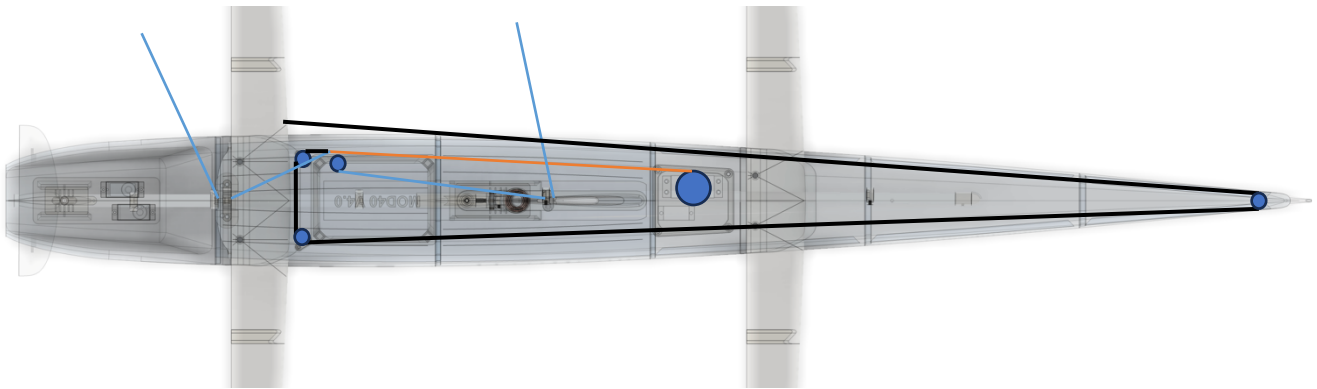
Sheeting

The sheeting can be done in an endless loop or with a single line and a rubber line to hold it in tension.

Option 1: Endless loop



Option 2: Single line (black line = rubber string)



The sail winch mounts to a plate that itself is mounted on the hull into a frame. There are two plates prepared for a RMG and a standard sized winch. You can also mount a small servo on that plate to connect the end of the jib sheet. This allows you to control the opening angle of the jib, including a hold back position to get the boat going after being parked in a tack.

Appendages

You should build the rudder and centerboard them from carbon fiber or purchase according parts, from IOM-boats or from the DF95. A centerboard case fitting the DF95 (a boat you can buy "DragonForce 95") fin is included as well as an STL for the centerboard as such. You can experiment printing in CF or making a mold for carbon fiber versions. If you can't find anything suitable, you can ask me for parts "laying around".

The rudder is approx. 200mm long and MUST have a perpendicular T-foil at the end to avoid pitchpoling in stronger winds during low speed bear-aways. The angle of attack of the T is +/- 0 degrees to the waterline.

Rig & Sails

See the dimensions of the maximum area A-Rig and the (scale) C-rig in the pictures folder. The mast and boom should be from woven carbon fiber with 1mm wall thickness.

The mast tapers from 14mm at the base to 12mm in the middle (2/3 of mast) to 10mm at the top. Double up the mast (with 10/12mm tubes) at the base around the gooseneck to increase stiffness. One pair of wired shrouds to the ama hulls is sufficient. The booms need to be quite strong. So 12mm for the main- and 10mm carbon for the jib-boom is adequate.

As for the fittings you can use the print files of the boom bands and for the gooseneck. The gooseneck needs 2 ball bearings (21mm/12mm outer/inner diameter, 5mm high) and a M3 screw with a small spring for twist adjustment. I can also recommend all fittings, sails & spars from "Sailsetc". Rigs from IOMs work as well.

Sailing

Make sure, to tension your forestay or shrouds quite a lot to get a stable jib and good upwind performance. When sailing upwind, the standard opening angle for the jib is 12 degrees and 2 degrees for the main. When fully eased, the booms should be parallel. You achieve this by a roughly 10% shorter distance of sheet attachment to pivot point of the main boom compared to the jib boom (e.g. jib boom 300mm, main boom 270mm).

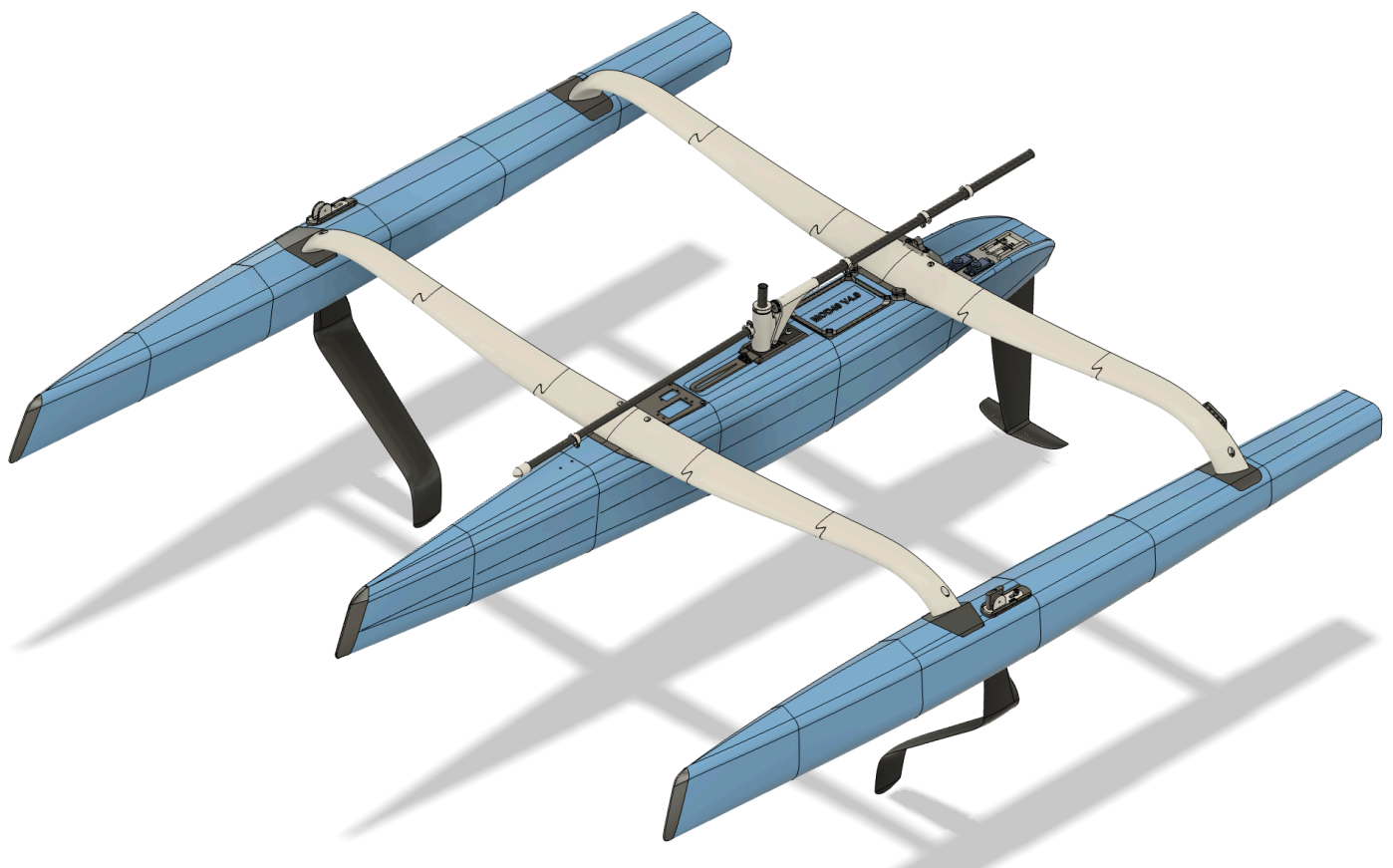
Mini40s can take quite some wind. With a smaller rig and some added ballast, they can easily sail in 20 knots of wind. Be prepared to have a plan ready for capsizing and try sailing windward of you. Sounds simple but boats have been drifting away...

Lastly: I have never had so much fun with RC-sailing than with a Mini40. It is spectacular, fast, on the edge and thus demanding all the time. Like flying a helicopter. With the supertall A-rig you don't need a lot of wind to put the boat on one hull and let it scream over the lake.

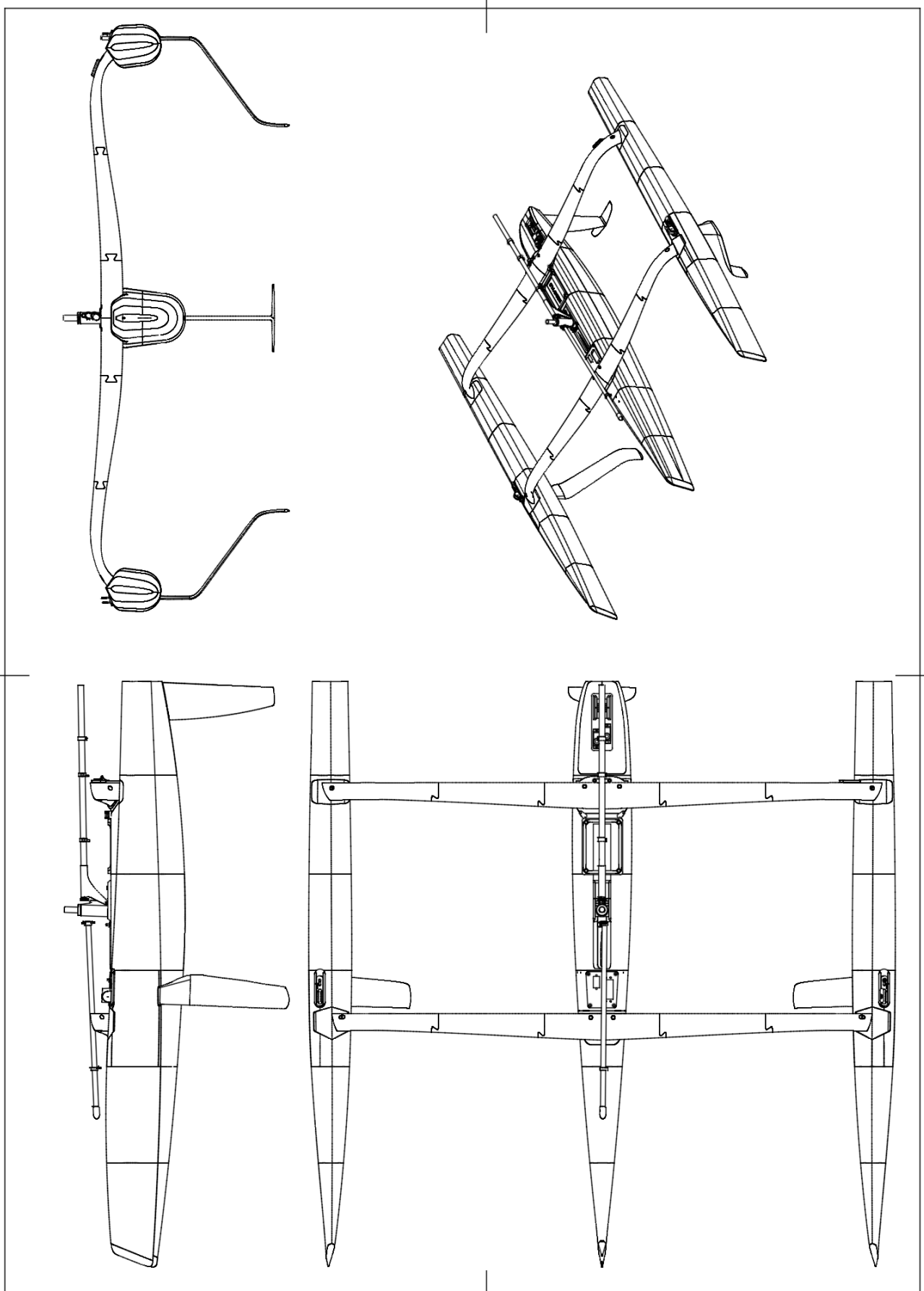
HAVE FUN! KEEP ME POSTED OF YOUR BUILDING & SAILING, PLS. ☺

QUESTIONS & CONTACT

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



DRAWINGS



MOD40 V4, 3D printing parts list

10 CENTER hull	Material	Nozzle	Infill	Quantity	Mirror?
Block PODEST.stl	PLA/PETG/-CF	0.4	100%	3	
BLOCK small low 4x8x3.stl	PLA/PETG/-CF	0.4	100%	3	
BLOCK small up 4x8x3.stl	PLA/PETG/-CF	0.4	100%	3	
Bumper Center.stl	TPU	0.5	none	1	
C attach front.stl	PLA/PETG/-CF	0.4	15%	1	
C attach rear.stl	PLA/PETG/-CF	0.4	15%	1	
Cneo 1.stl	LW-PLA/ASA	0.8	none	1	
Cneo 2.stl	LW-PLA/ASA	0.8	none	1	
Cneo 3.stl	LW-PLA/ASA	0.8	none	1	
Cneo 4 lower L.stl	LW-PLA/ASA	0.8	none	1	
Cneo 4 lower R.stl	LW-PLA/ASA	0.8	none	1	
Cneo 4 upper.stl	LW-PLA/ASA	0.8	none	1	
Cneo 5 lower.stl	LW-PLA/ASA	0.8	none	1	
Cneo 5 upper.stl	LW-PLA/ASA	0.8	none	1	
Cneo 6 L.stl	LW-PLA/ASA	0.8	none	1	
Cneo 6 R.stl	LW-PLA/ASA	0.8	none	1	
HATCH frame magnets.stl	PLA/PETG/-CF	0.4	100%	1	
HATCH handle.stl	PLA/PETG/-CF	0.4	100%	1	
HATCH magnets.stl	PLA/PETG/-CF	0.4	100%	1	
MAIN SHEET POST plate.stl	PLA/PETG/-CF	0.4	100%	1	
SHEET POST bracket.stl	PLA/PETG/-CF	0.4	100%	1	
SHEET POST.stl	PLA/PETG/-CF	0.4	100%	1	
WINCH Frame.stl	PLA/PETG/-CF	0.4	100%	1	
WINCH Mount Plate - winde links.stl	PLA/PETG/-CF	0.4	100%	1	
WINCH Mount Plate RMG.stl	PLA/PETG/-CF	0.4	100%	1	
20 AMA hull	Material	Nozzle	Infill	Quantity	Mirror?
A1.stl	LW-PLA/ASA	0.8	none	2	
A2.stl	LW-PLA/ASA	0.8	none	2	
A3 L foil inside.stl	LW-PLA/ASA	0.8	none	2	yes
A3 L foil outside.stl	LW-PLA/ASA	0.8	none	2	yes
A3 non foil version.stl	LW-PLA/ASA	0.8	none	2	
A4.stl	LW-PLA/ASA	0.8	none	2	
A5.stl	LW-PLA/ASA	0.8	none	2	
A6.stl	LW-PLA/ASA	0.8	none	2	
AMA BUMPER neo.stl	TPU	0.4	none	2	
ATTACH Ama front (1).stl	PLA/PETG/-CF	0.4	15%	2	yes
ATTACH Ama rear (1).stl	PLA/PETG/-CF	0.4	15%	2	

30 BEAMS	Material	Nozzle	Infill	Quantity	Mirror?
BEAM neo back inside.stl	LW-PLA/ASA	0.8	none	1	
BEAM neo back outside L.stl	LW-PLA/ASA	0.8	none	2	yes
BEAM neo front and back middle L.stl	LW-PLA/ASA	0.8	none	4	
BEAM neo front inside.stl	LW-PLA/ASA	0.8	none	1	
BEAM neo front outside L.stl	LW-PLA/ASA	0.8	none	2	yes
PODEST Rear Beam.stl	LW-PLA/ASA	0.8	15%	1	
REAR BEAM 1 - attach.stl	LW-PLA/ASA	0.8	none	2	yes
REAR BEAM 2 - middle.stl	LW-PLA/ASA	0.8	none	2	yes
REAR BEAM 3 - center.stl	LW-PLA/ASA	0.8	none	1	
SHROUD EYE PLATE.stl	PLA/PETG/-CF	0.4	100%	2	
40 RUDDER & CENTERBOARD	Material	Nozzle	Infill	Quantity	Mirror?
ADAPTER MICRO SERVO.stl	PLA/PETG/-CF	0.4	100%	1	
ADAPTER SKID ROD.stl	PLA/PETG/-CF	0.4	100%	1	
CENTERBOARD DF95 style.stl	PLA/PETG/-CF	0.4	100%	1	
MAST CONTROLLER.stl	PLA/PETG/-CF	0.4	100%	1	
MAST-FIN BOX - outside piece.stl	PLA/PETG/-CF	0.4	100%	1	
MAST-FIN BOX.stl	PLA/PETG/-CF	0.4	100%	1	
RUDDER (1).stl	PLA/PETG/-CF	0.4	100%	1	
Rudder BOX.stl	PLA/PETG/-CF	0.4	100%	1	
Rudder skid plate.stl	PLA/PETG/-CF	0.4	100%	1	
T-RUDDER NACA 007.stl	PLA/PETG/-CF	0.4	100%	1	
50 FOIL	Material	Nozzle	Infill	Quantity	Mirror?
foil case L.stl	PLA/PETG/-CF	0.4	100%	2	yes
foil case skid L.stl	PLA/PETG/-CF	0.4	100%	2	yes
FOIL L.stl	PLA/PETG/-CF	0.4	100%	2	yes
FOIL top.stl	PLA/PETG/-CF	0.4	100%	2	yes
60 RIG	Material	Nozzle	Infill	Quantity	Mirror?
Boom band 10mm 1 ring.stl	PLA/PETG/-CF	0.4	100%	dep.	
Boom band 10mm 2 rings.stl	PLA/PETG/-CF	0.4	100%	1	
Boom band 12 1x ring.stl	PLA/PETG/-CF	0.4	100%	1	
Boom Band long 10mm.stl	PLA/PETG/-CF	0.4	100%	1	
Boom Band long 12mm.stl	PLA/PETG/-CF	0.4	100%	1	
Boom cap.stl	PLA/PETG/-CF	0.4	100%	1	
Gooseneck boom part.stl	PLA/PETG/-CF	0.4	100%	1	
Gooseneck mast part.stl	PLA/PETG/-CF	0.4	100%	1	
Gooseneck stopper ring.stl	PLA/PETG/-CF	0.4	100%	1	
Gooseneck thumb screw.stl	PLA/PETG/-CF	0.4	100%	1	
70 Boat stand	Material	Nozzle	Infill	Quantity	Mirror?
Stand back.stl	PLA/PETG/-CF	0.4	15%	1	
Stand front.stl	PLA/PETG/-CF	0.4	15%	1	
80 MOD Mikro	Material	Nozzle	Infill	Quantity	Mirror?
MOD40 micro.stl	PLA/PETG/-CF	0.4	100%	1	

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

