

Mikul

cargo barge RC model



Table of Contents

Parameters..... 3

Intro..... 3

Non-printed parts needed..... 3

Printing..... 4

 Recommended settings..... 4

 Hull..... 4

 Rudder..... 4

 Cargo bay..... 4

 Bollard..... 4

 Other parts..... 4

Building..... 5

Parameters

- Length: 250 mm
- Width: 73 mm (84 mm with stand)
- Height: 110 mm
- Weight (fully assembled and painted): 220g (+13g stand)

Intro

This RC boat is very easy to print and assemble. The original blueprint is from Czechoslovakian magazine Modelář 10/1966 and it was designed for scale 1:20 (length 40cm). This model is simplified and downsized to scale 1:32 but despite its small size, it's quite stable even on waves.

Scanned magazine: https://rcbookcase.com/details.php?publication_id=1250

Non-printed parts needed

- 1.5 mm steel wire (propeller shaft and rudder shaft)
- 1 mm steel wire (to connect the servo with rudder lever)
- semisolid grease lubricant
- M3 setscrew (to attach a funnel to cargo bay)
- short M2 bolt or setscrew (for rudder lever)
- 2x cable tie (2.5 mm width)
- micro servo SG90 (or any other of this size)
- motor:
 - standard size 130 (example: <https://aliexpi.com/QdcT>)
 - or**
 - 9V FF-050SK (can be found in some CD / DVD drives; use part "engine-reduction" to fit it in place) (example: <https://aliexpi.com/yU0k>)
- ESC, receiver
- battery (2S Li-Poly, size ~30x57 mm recommended)

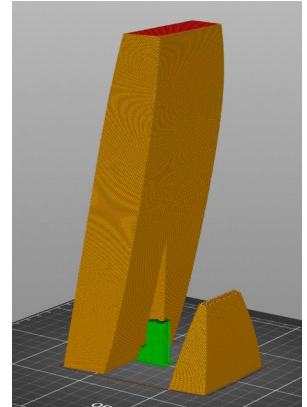
Printing

Recommended settings

- **Material:** PETG (hull, cargo bay, servo holder), PLA (smaller parts and wheelhouse)
- **Layer:** 0.2 mm (hull), 0.1 mm other parts
- **Perimeters:** 3
- **Infill:** ~ 5%

Hull

- put on a stern
- use supports just on the printing bed
- cut at 196 mm if necessary - that will give you surface big enough to glue it together
- 3 perimeters
- ~ 5% infill

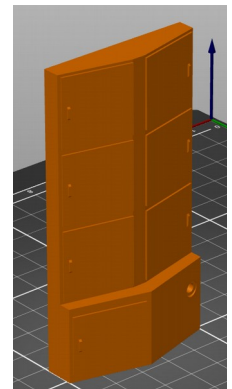


Rudder

- put on the side (rotate 90deg around X)
- cut at 2.6 mm and turn bottom part upside down
- no supports needed
- glue together after gluing the shaft in place

Cargo bay

- put on the rear side (as on the picture)
- no supports needed



Bollard

This part is quite hard to print, you may have problems with stringing, etc. Probably the best way to print it is to use an SLA printer.

Other parts

- no supports needed
- use brim when needed (roof, funnel, propeller, wheelhouse, ...)
- **parts needed 2x:** bollard, stand-mid

Building

1. Glue both parts of the hull together (see section Printing / Hull) and do some post-processing and painting.

2. Motor and propeller:

- (1) Put the motor on the motor bed and check whether its shaft is co-linear with the propeller shaft. If the motor is higher, find a smaller motor; if it's lower, print some reduction.
- (2) Connect the motor to the ESC and fix it on the bed with 2 cable ties.
- (3) Cut 10 cm of 1.5 mm steel wire for a propeller shaft and flatten it on sides on one end with an angle grinder (or similar tool) to fit it in the propeller.
- (4) Attach the propeller to the shaft, add a **prop-spacer** part, put it in the hull, and try whether everything is matching; if not, shorten the shaft a bit.
- (5) Test the movement of the shaft – if it's too hard, clean the hole or make the shaft smoother (or thinner).
- (6) Put enough grease lubricant between the propeller spacer and the hull to make it waterproof.
- (7) Connect the motor shaft with the propeller shaft using the **joint** part.
⚠ Please notice that the provided joint is designed for the motor of FF-050SK class, for the different one you will have to make a different joint. Also, you can try to use a rubber or silicone tube.
I've tried a heat-shrink tube and it didn't work well.
- (8) Test everything and if it works, proceed to the next step

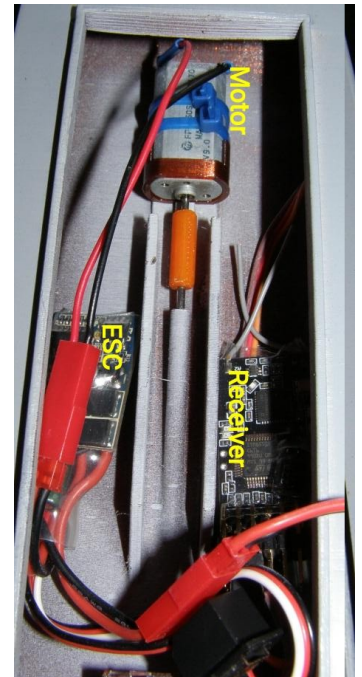
3. Rudder:

- (1) Prepare the shaft from 1.5 mm steel wire. Bend it in a way, that it matches with the hole in the rudder. Glue both sides of the rudder around the shaft. Then cut the shaft to the necessary length (it should almost reach the bottom of the deck).
(2) Now it is the best time to paint the rudder.
- (3) Put the servo in the **servo-holder** part and affix it there with one of its fixing screws. Find the servo's neutral position and attach a one-side lever on it.
- (4) Prepare the pull rod from 1 mm steel wire. The length of the straight part should be ~20 mm.
⚠ Please notice that the bent parts of the pull rod should be rotated by 90 deg against each other.

(5) Prepare the **rudder-lever** by screwing an M2 bolt (or setscrew) in the hole. Try if it fits the shaft (outside the hull). Consider flattening one side of the shaft with an angle grinder to make the bolt (or setscrew) hold it more firmly.

(6) Attach the pull rod to the rudder lever. Put some grease lubricant on the rudder shaft and put it on the place. Put the lever on the shaft inside the hull. This step is almost a nightmare but believe me, I have done it three times successfully so it is possible however foolish it may look 😊. Correct the position of the parts and tighten the lever bolt (or setscrew).

(7) Attach the opposite side of the pull rod to the servo lever and put the servo in place: there is a gap in the servo holder which should match the rudder shaft housing. If it doesn't hold on place as it is, attach the holder to the bottom of the hull with glue or 2-side sticker.



4. Electronics:

Put the receiver on one side, ESC on the other, and battery on top. You can see the recommended arrangement on the photos.

5. Additional notes:

- It's better not to glue the wheelhouse and cargo bay together; also, a wheelhouse roof can be free.
- You can use a setscrew to attach the funnel to the cargo bay firmly but don't use a bolt – there is not enough space for its head.
- Bollard can be fixed on its place with 2 small pieces of 1.75 mm filament.

