

## BLUEBOAT ASSEMBLY GUIDE

## Introduction

Your BlueBoat is here! This guide will show you how to assemble it.



### BlueBoat Uncrewed Surface Vessel

The planet's most flexible and expandable surface vessel

**\$4,400.00**

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The BlueBoat base kit includes most of the tools you will need to assemble your BlueBoat. Assembly takes around one to two hours. Ensure you have plenty of space and a well-lit work area. You will also need the following tools that are not included with the kit to complete the build:

- 1 x 16 mm wrench (or a [Blue Robotics M10 Bulkhead Wrench](#) if you have one)
- 2 x Cable ties

## Unpacking the BlueBoat Kit

1. Unfasten and remove the straps to separate the BlueBoat hulls.
2. Open the hatch lids by pressing in the latch clips to release the latches. Remove the hatch lid assembly from each hull and set them to the side.

## navigation

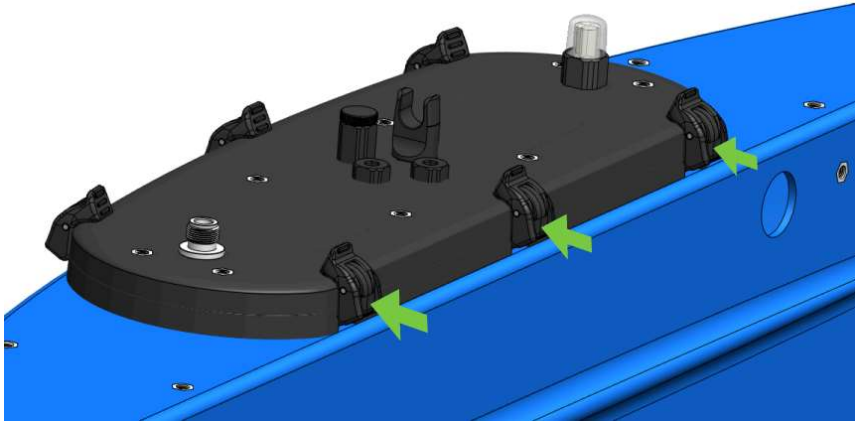
[Introduction](#)[Unpacking the BlueBoat Kit](#)[Connecting the Hulls](#)[Installing the Crosstube](#)[Installing the Propellers](#)[Installing the Hatch Lid Assembly  
Splitter Cables](#)[Installing the Antenna and Flagpole](#)[Applying the Stickers](#)[Applying Battery Velcro Strips](#)[Next Steps](#)[BlueBoat Components Assembly](#)[Feedback](#)[Print](#)

## Tags

[Assembly](#)[BlueBoat](#)

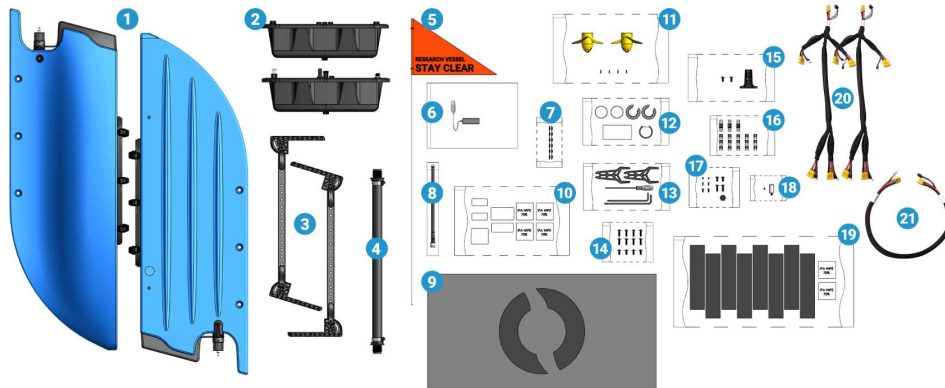
Posted 14 Jun 2023

Last updated on 26 Aug 2024



Releasing the latches.

3. Unpack the contents of each hull. After unpacking the BlueBoat box and hulls, you should have the following components:



1. 2 x BlueBoat hull (starboard and port)
2. 2 x Hatch lid assembly (starboard and port)
3. 2 x Frame assembly
4. 1 x Crosstube assembly (with cables)
5. 1 x Flag
6. 1 x USB Ethernet adapter
7. 12 x Frame bushing spares
8. 1 x Antenna assembly
9. 1 x Microfiber towel
10. Sticker set
11. Propeller set
  - 2 x Weedless propeller (LH and RH)
  - 4 x M3x8 Socket head cap screw
12. Crosstube hardware
  - 2 x Crosstube C-nut
  - 2 x -129 O-ring
  - 1 x Hook and loop strap with buckle
  - 1 x Molykote 111 silicone grease 6g
13. BB120 tools
  - 2 x BB120 Wrench

- 1 x 2.5 mm hex driver
- 1 x 4 mm hex key
- 1 x 5 mm hex key

#### 14. Frame hardware

- 4 x M6x14 flanged button head screws
- 8 x M6x20 flanged button head screws

#### 15. Antenna Guard

- 1 x Hatch Lid Antenna Guard
- 2 x M6x14 flanged button head screws

#### 16. Fuse spares

- 1 x 150A MIDI fuse
- 2 x 50A MIDI fuse
- 5 x 2A MINI blade fuse
- 5 x 5A MINI blade fuse
- 5 x 10A MINI blade fuse

#### 17. Spare hardware set

- 2 x M6x20 flanged button head screws
- 2 x M6x14 flanged button head screws
- 2 x M4x10 flanged button head screws
- 2 x M3x8 socket head cap screw
- 2 x M5x5 cup-point set screw
- 1 x Frame clamp thumb nut

#### 18. Flagpole mount

- 1 x Flagpole mount
- 1 x M5x5 cup-point set screw

#### 19. Battery Velcro strip set

- 8 x Velcro strip
- 2 x 70% Alcohol wipe

#### 20. 2 x 4S splitter cable

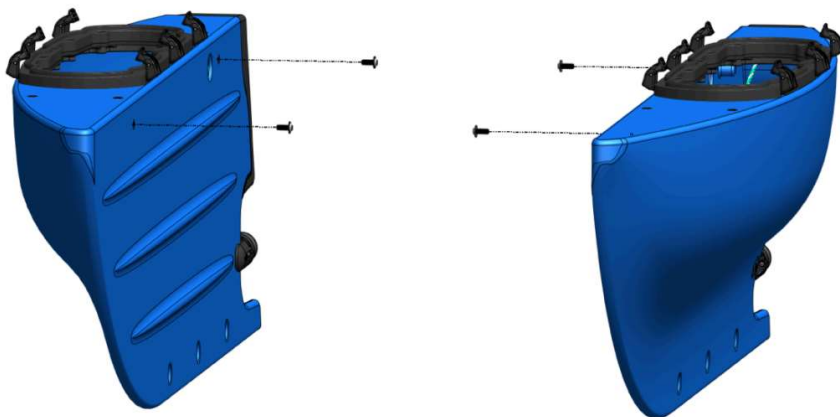
#### 21. 1 x Charge cable

## Connecting the Hulls

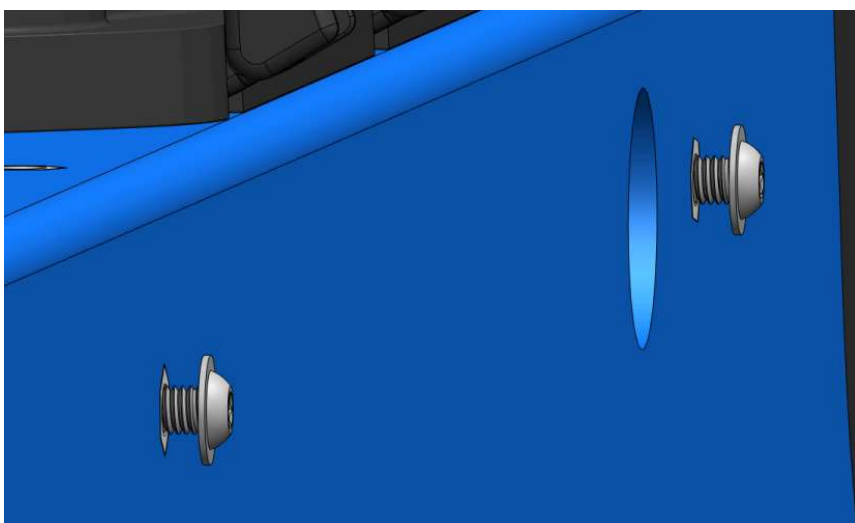
To connect the BlueBoat hulls you will need:

- 2 x BlueBoat hull (starboard and port)
- 2 x Frame assembly
- 1 x Bag of Frame Hardware
  - 4 x M6x14 flanged button head screws
  - 8 x M6x20 flanged button head screws
- 1 x 4 mm hex key

1. Inside the bag of frame hardware, you will find four M6x14 flanged button head screws and eight M6x20 flanged button head screws. Take the four shorter M6x14 screws and partially thread them into the threaded inserts located on the flat side of the hulls.

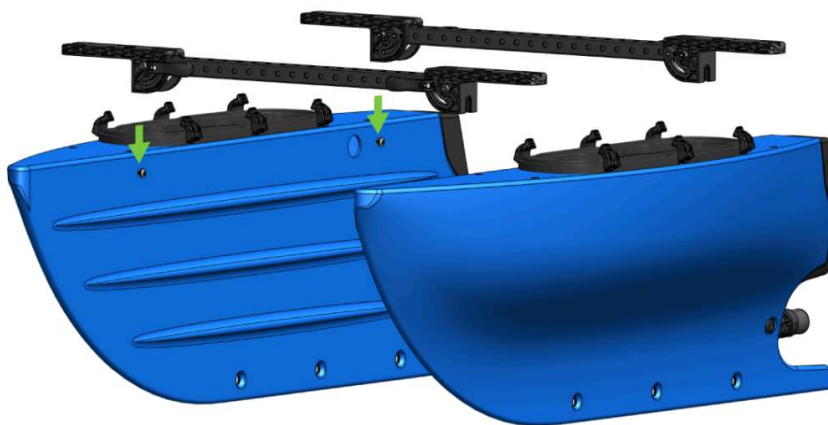


Leave about a 6 mm (~¼ inch) gap between the screw head and the hull.

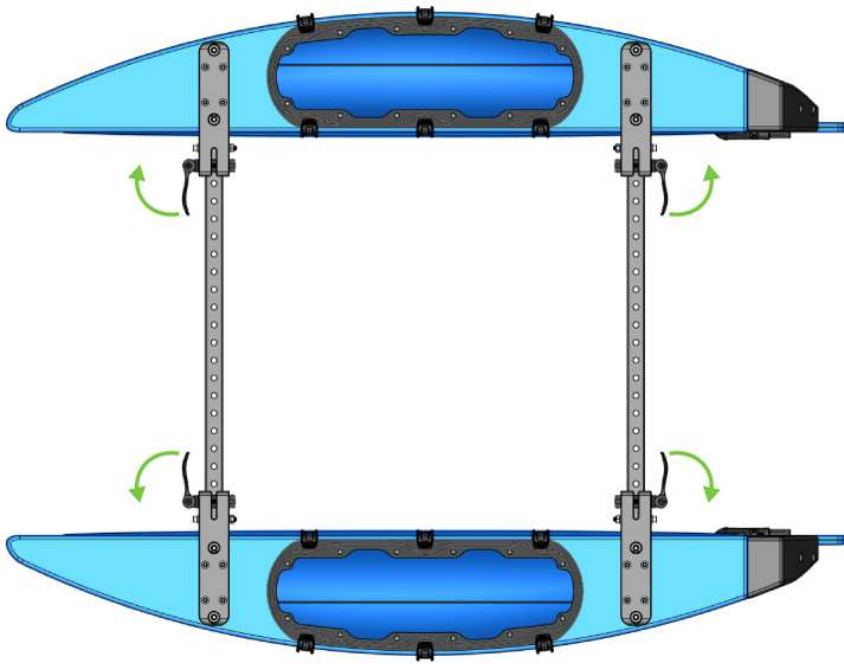


2. Release the cam lever handles on both frame assemblies and unfold them so they are fully extended. Close the cam lever handles to lock the frame assemblies in the fully extended position.

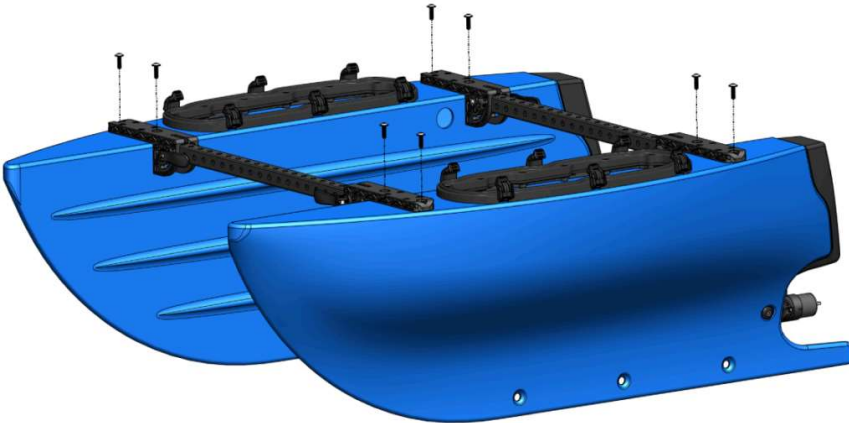
3. Install the frame assemblies by sliding the frame assembly brackets over the M6x14 screws so the screw is captured by the slot in the bracket. Back the screw out a little bit more if it is difficult to slide into the slot.



The frame assemblies should be oriented so the cam lever handles open outward, away from the center of the boat. Do not tighten the screws yet.



4. Secure the frame assemblies to the hulls using the remaining eight M6x20 screws. Thread the screws **loosely** at first, then use the 4 mm hex key to fully tighten **all twelve** M6 screws after all the screws are in place. Tighten the screws to about  $\frac{1}{4}$  to  $\frac{1}{2}$  turn past snug. Do not forget about the first four M6x14 screws!



5. Your BlueBoat should now look like this. Going forward, we will refer to the left side and right sides of the boat using the nautical terms "port" and "starboard". If you imagine you are a tiny passenger on the BlueBoat, facing the front of the boat, the left side is the port side and the right is the starboard side.



# Installing the Crosstube

To install the crosstube you will need:

- 1 x Crosstube assembly (with cables)
- 2 x BB120 Wrench
- 1 x Bag of crosstube hardware
  - 2 x Crosstube C-nut
  - 2 x -129 O-ring
  - 1 x Hook and loop strap with buckle
  - 1 x Molykote 111 silicone grease 6g

1. Remove the two O-rings from the bag and apply a thin, even coat of the included Molykote 111 silicone grease to them. Install one O-ring on each end of the crosstube assembly. The O-rings should sit in the groove in the crosstube barb.



O-ring installed in barb.

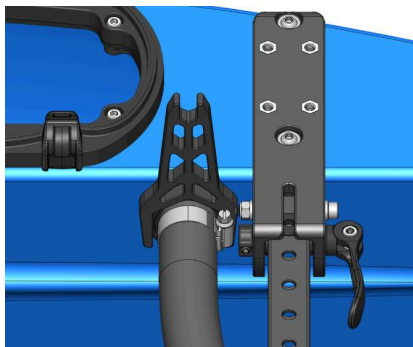
2. Each end of the cross cable assembly inside the crosstube is labeled to indicate which hull it should be connected to.



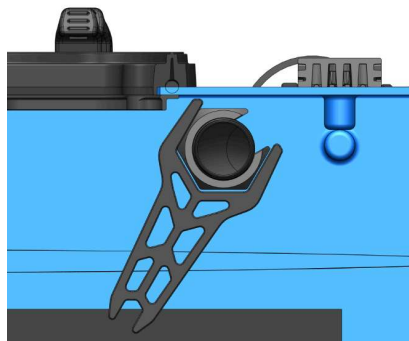
Connect the end labeled “STBD” to the starboard hull and the end labeled “PORT” to the port hull. Fully insert the cables and threaded barb ends into the holes near the rear crossbar of each hull.



3. Thread the crosstube C-nuts onto the barbs inside the hulls. Use one of the included wrenches to hold the barb in place while you use the other wrench to fully tighten the C-nut inside the hull.



Use the wrench to hold the barb.



Tighten the nut inside the hull.

4. Use the included strap to secure the crosstube to the rear crossbar.

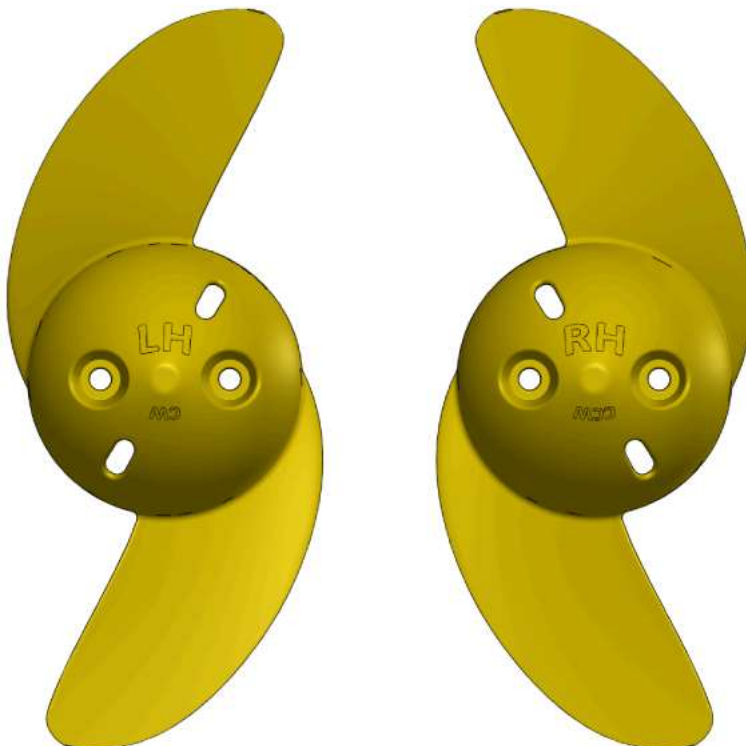


## Installing the Propellers

To install the propellers you will need:

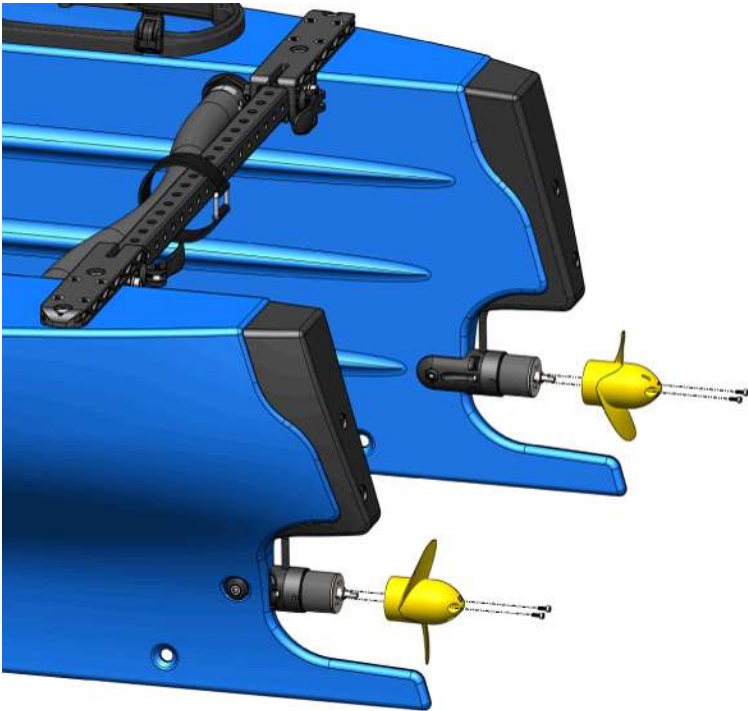
- 1 x Propeller set
  - 2 x Weedless propeller (LH and RH)
  - 4 x M3x8 Socket head cap screw
- 1 x 2.5 mm hex driver

1. The propellers are marked with "LH" for the Left-Hand propeller and "RH" for the Right-Hand propeller.



2. Use the 2.5 mm hex driver and M3x8 socket head cap screws to install the propellers on the M200 motors. Install the LH propeller on the M200 motor on the port side and the RH propeller on the M200 motor on the starboard side. Make sure you are screwing into the threaded screw holes and

not the unthreaded rotor ventilation holes.



Installing propellers.

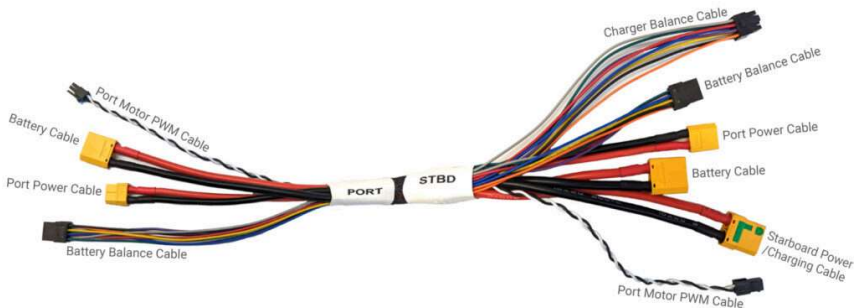
# Installing the Hatch Lid Assemblies and Splitter Cables

For this section you will need:

- 2 x Hatch lid assembly (starboard and port)
- 2 x 4S splitter cable
- 2 x Cable ties

The diagrams below identify all the cables within the cross cable and the hatch lid assemblies for reference. The number of cables and connectors may seem intimidating at first, but every cable connector is keyed and only mates with one other connector, so you should not worry about connecting anything the wrong way.

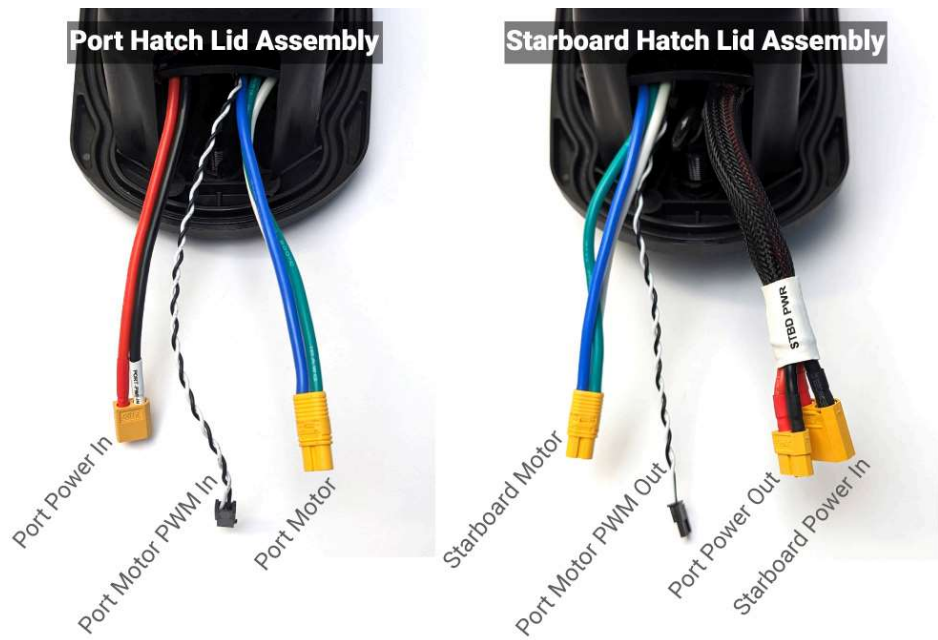
## Cross Cable



| Cable                          | Connector    |
|--------------------------------|--------------|
| Starboard                      |              |
| Starboard Power/Charging Cable | XT90S female |

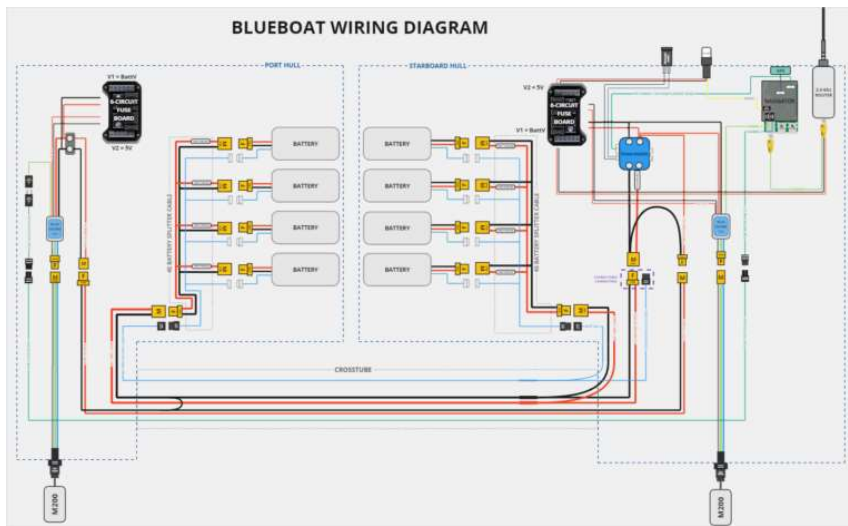
| Cable                 | Connector                    |
|-----------------------|------------------------------|
| Port Power Cable      | XT60 male                    |
| Battery Cable         | XT90 male                    |
| Battery Balance Cable | 8-pin Molex Micro-Fit male   |
| Charger Balance Cable | 8-pin Molex Micro-Fit female |
| Port Motor PWM Cable  | 2-pin Molex Micro-Fit male   |
| <b>Port</b>           |                              |
| Port Power Cable      | XT60 female                  |
| Battery Cable         | XT90 male                    |
| Battery Balance Cable | 8-pin Molex Micro-Fit male   |
| Port Motor PWM Cable  | 2-pin Molex Micro-Fit female |

**Hatch Lid Assembly Cables**



| Cable              | Connector                    |
|--------------------|------------------------------|
| <b>Starboard</b>   |                              |
| Starboard Power In | XT90 male                    |
| Port Power Out     | XT60 female                  |
| Port Motor PWM Out | 2-pin Molex Micro-Fit female |
| Starboard Motor    | MT60 female                  |
| <b>Port</b>        |                              |
| Port Power In      | XT60 male                    |
| Port Motor PWM In  | 2-pin Molex Micro-Fit male   |
| Port Motor         | XT60 female                  |

A [complete BlueBoat wiring diagram is available here](#) for reference (click for full-size PDF).



1. Connect the cables from each hatch lid assembly to the cross cable. On the starboard hatch lid assembly (the one with the antenna connector and NavLight), you will connect the **starboard power** cable, **port power** cable, and **port motor PWM** cable. You will also connect the **starboard motor** cable to the motor cable from the rear of the hull.

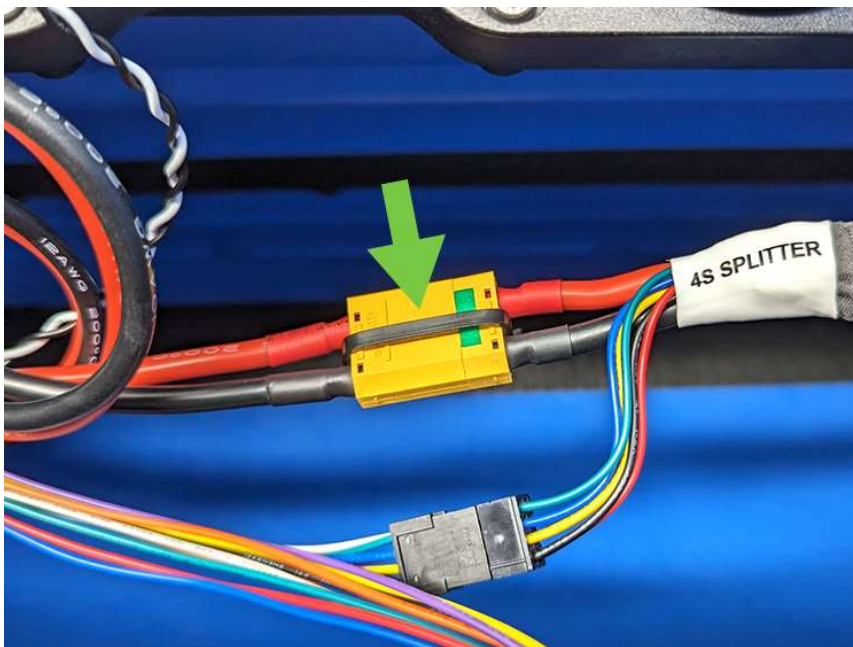


On the port side you will connect the **port power** and **port motor PWM** cables. You will also connect the **port motor** cable to the motor cable from the rear of the hull.

2. Install a 4S splitter cable in each hull. For each splitter cable, connect the **female** XT90 connector and the 8-pin Molex connector to the cross cable **battery cable** and **battery balance cable** in each hull. Install a cable tie around the XT90 connectors to prevent it from being disconnected.



If you are installing 6S splitter cables instead of 4S splitter cables, be sure to follow the [6S Battery Splitter Cable Installation](#) guide.



Cable tie installed around splitter cable connector.

The remaining connectors on the splitter cables are used to connect batteries and will remain unpopulated for now. The 8-pin **charger balance cable** on the starboard side is only used during charging and will also remain unconnected for now. Install the hatch lid assemblies in the hulls when you are done.



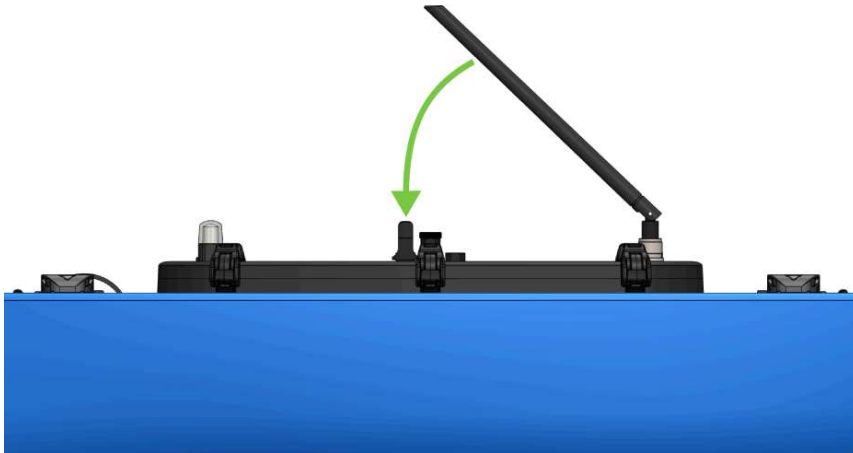
## Installing the Antenna and Flagpole

To install the antenna and flagpole you will need:

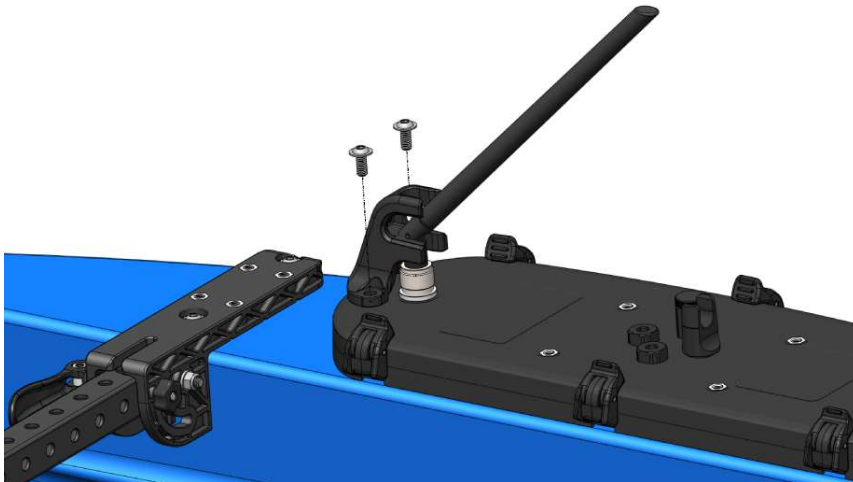
- 1 x Antenna assembly
- 1 x Bag with Antenna Guard
  - 1 x Hatch Lid Antenna Guard
  - 2 x M6x14 flanged button head screws
- 1 x Bag with flagpole mount

- 1 x Flagpole mount
- 1 x M5x5 cup-point set screw
- 1 x Flag
- 1 x 2.5 mm hex driver
- 1 x 4 mm hex key
- a 16 mm wrench (or M10 Bulkhead Wrench)

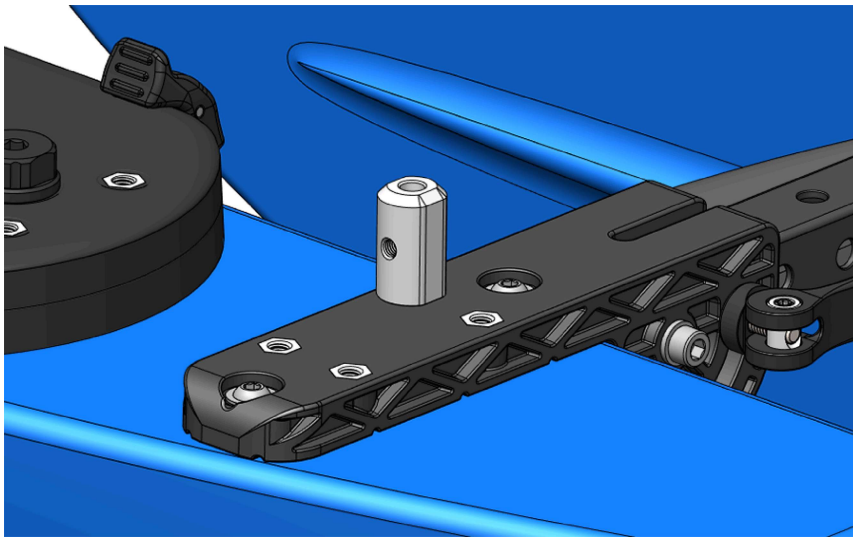
1. Screw the antenna onto the antenna connector on the starboard side hatch lid. Orient the antenna so it folds down and clips into the antenna clip.



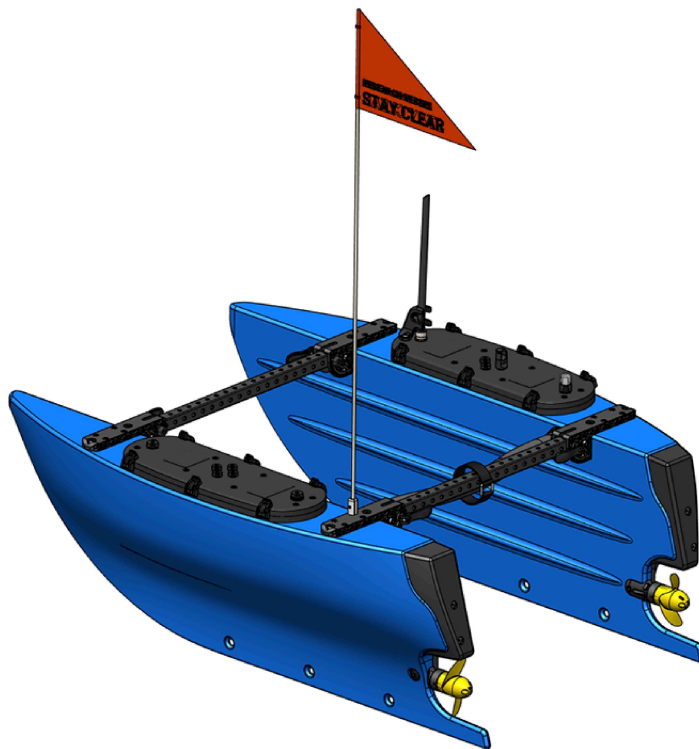
2. Coming from the front of the antenna, push the antenna guard onto the antenna and into place. Secure the antenna guard to the hatch lid using the M6x14 flanged button head screws and 4 mm hex key.



3. The flagpole mount can be installed on any of the frame bracket mounting points. We like to install ours on the rear port side bracket, but the mounting location is ultimately up to preference and whatever works best for your use. Choose a mounting location and install the flagpole mount in one of the frame bracket mounting holes to hand-tight. Use a 16 mm wrench to turn it an additional  $\sim\frac{1}{4}$  turn (the M10 Bulkhead Wrench can also be used if you have one available).



4. Insert the flagpole into the flagpole mount and use the M5x5 cup-point set screw and 2.5 mm hex driver to secure it in place.



## Applying the Stickers

The bag of BlueBoat stickers contains:

- 1 x BlueBoat identification sticker
- 1 x On/off switch sticker
- 2 x Caution sticker
- 4 x Alcohol wipe

The suggested locations for each sticker are shown below. Use the alcohol wipes to clean the surface before applying each sticker.

The propeller caution stickers should be applied on the top of both hull fairings, above the propellers.



The on/off sticker should be applied to the side of the power switch on the starboard hatch lid.



The identification sticker should be applied in the rectangular depression on the starboard hatch lid.



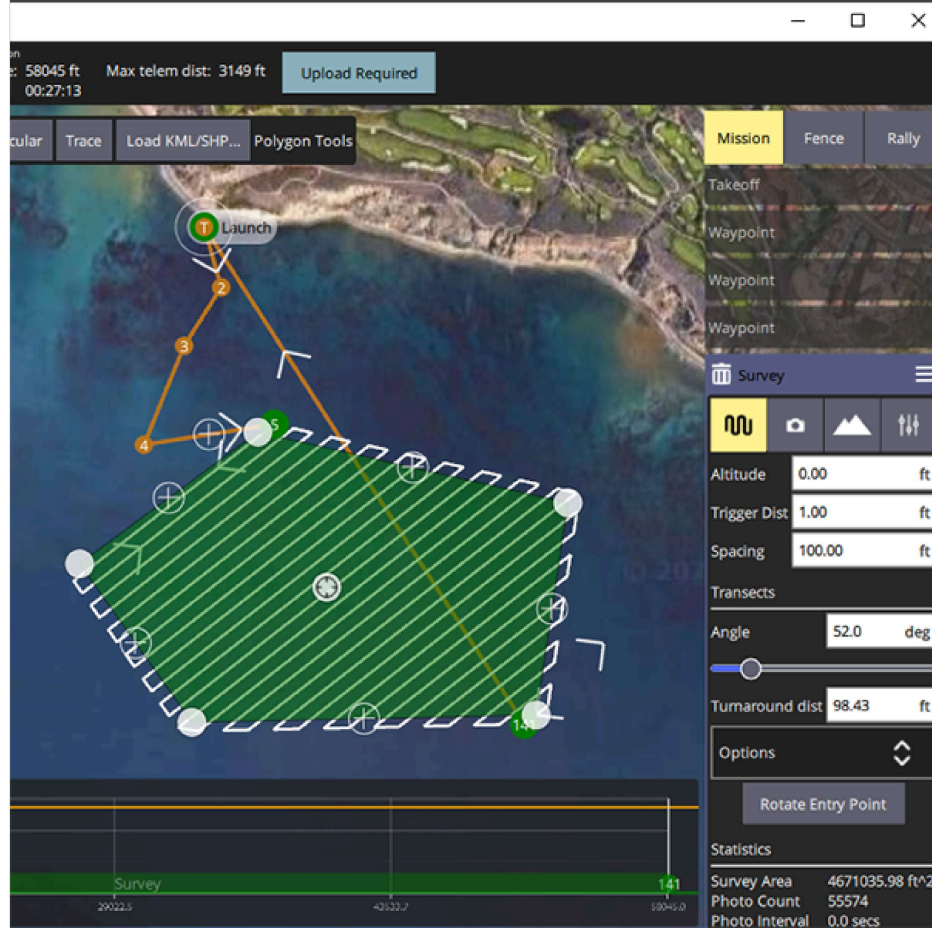
## Applying Battery Velcro Strips

The supplied Velcro strips should be applied to your batteries to prevent them from shifting around inside the hulls during operation. Use the alcohol wipes to clean the surface of the batteries. Remove the backing film from the strips and apply one around each end of the battery.



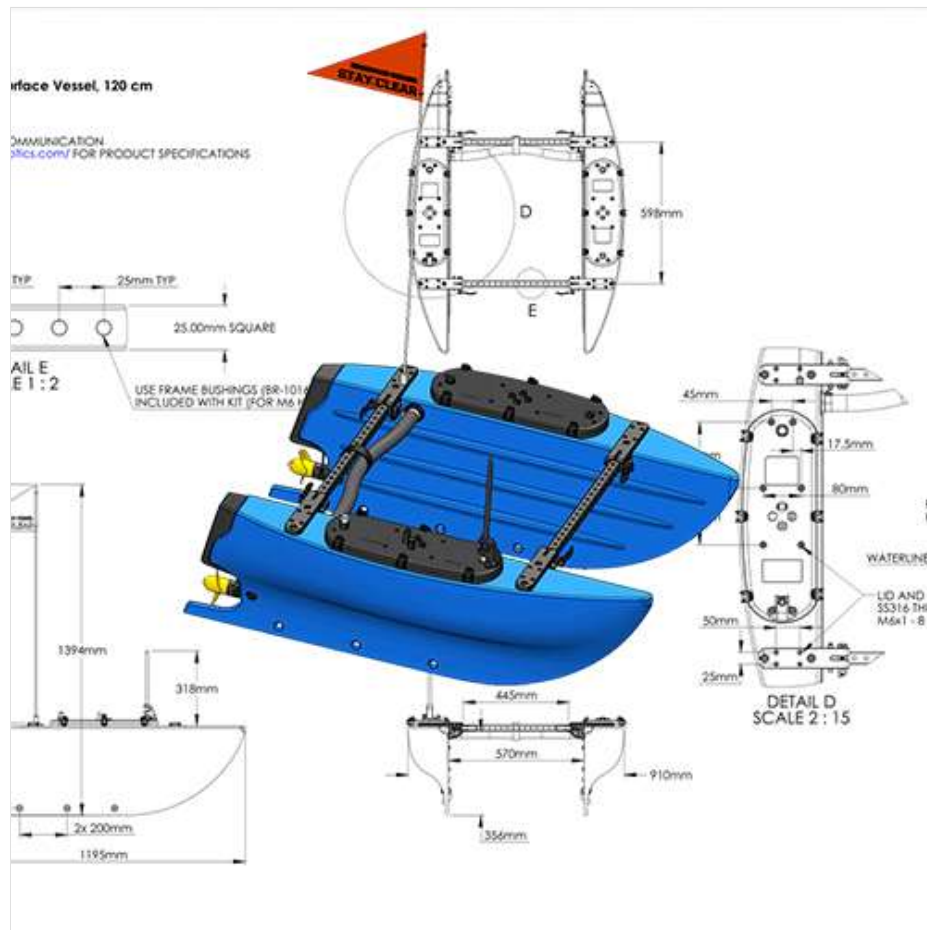
## Next Steps

Head over to the [BlueBoat Software Setup guide](#) to learn how to setup the software for your BlueBoat. After that, check out the [Operator's Guide](#) to set out on your first mission. You can also visit the [BlueBoat General Integration Guide](#) to learn about the various ways BlueBoat supports integrating payloads.



## BlueBoat Operator's Guide

Learn how to operate your BlueBoat!



## BlueBoat Components Assembly

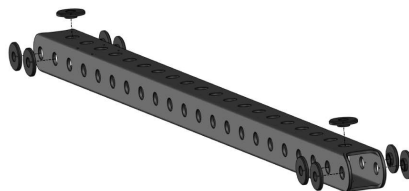
### BlueBoat Crossbars and Brackets

BlueBoat components are designed to be integrated, plugged in, and generally integrated into the BlueBoat vehicle platform!

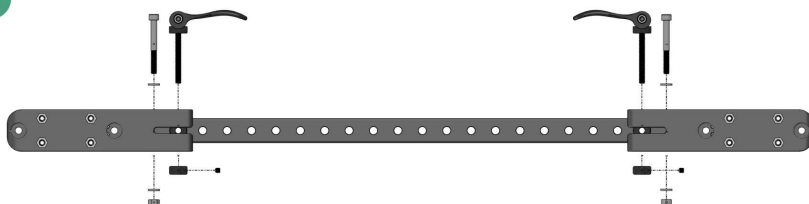
1



2



3



## BlueBoat Hatch Base and Latches



## Feedback

We're always working to make our documentation, instructions, software, and user experience even better. If you have any ideas on how we can improve this guide, feel free to let us know [here](#).



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